Digital Health - Developing Skills in third age

Guideline Report Project Result 1

(PR1)

Project number: 2021-1-DE02-KA220-ADU-000033744

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Abstract

Introduction: This guidelines report presents and discusses the findings from research carried out as part of the EU funded project “Digihall Digital Health - Developing Skills in third age“. It provides a comprehensive overview of the current situation with regard to digital health literacy (DHL) and digital health technologies (DHT) in the participating countries: Italy, Greece and Germany. The report is considered an important milestone within the project, as it will guide the design, development, testing, and implementation of the Digihall E-learning platform and App. Results of this study will determine the orientation and content of the Digihall course on training mentors to support older people and improving their competences regarding DHT and DHL.

Theory: “*eHealth literacy [Digital Health Literacy = DHL] includes a dynamic and context-specific set of individual and social factors as well as technology constraints (such as the fit of a system to the user) in the use of digital technologies to search, acquire, comprehend, appraise, communicate, apply and create health information in all contexts of health care with the goal of maintaining or improving the quality of life throughout the lifespan”* (Griebel et al. quoted after, Samerski & Müller 2019, p.43).

The focus of the research work carried out is on examining the role and significance of DHL on a national level (checking the framework of each project country) and the comparison with the European context as well as among each other. In addition, finding existing good practices regarding ways of empowering older people through DHL is part of this task.

The aim is as well to get a better understanding/overview of the status quo of the digital health literacy among people in third age, especially regarding their needs and how their competencies can be improved - from their concrete everyday life and experiences.

Method: A literature review in each partner country was done. For these national literature reviews, partners focused on the "leading questions" listed in Chapter 1 and used a template to create a similar structure and compare results. Based on the results of the literature review and education gap analysis semi-structured interviews in each partner country have been conducted (20 in total) with people in third age, informal and low-trained caregivers, volunteers and also digital health experts.

Results: In line with Samerski and Müller's (2019) DHL definition, our results show social embeddedness and *technological requirements/framework* as key influencing factors to be considered. In addition, concrete recommendations for action, as mentioned in chapter 6, result for the following further main categories: *Didactics* of the e-learning platform and app, *motivational factors*, *content and structure* of the e-learning platform and app, m*ethods/modes of presentation* of the e-learning platform and app, *political lobbying.*

Discussion: A lot of valuable information has been collected, especially about the needs and requirements from the target groups' point of view. The next step will be to evaluate and prioritize them, as not all needs can be met within the scope of the project. Then we will translate the needs and requirements into competencies and learning objectives (PR2) so that we are able to develop the learning materials and decide on the design of the platform.

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List of abbreviations

AMMA	Associazione Molisana Malati di Alzheimer (Molisana Alzheimer's Association)
BMEL	Bundesministerium für Ernährung und Landwirtschaft (Federal Ministry of Food and Agriculture)
BULE	Bundesprogramm Ländliche Entwicklung (German Federal Development Program)
DE	Germany
DEI	Digital Evolution Index
DESI	Digital Economy and Society Index
Destatis	Statistisches Bundesamt (Federal Statistical Office)
DG Connect	European Commission's Directorate-General for Communication Networks, Content and Technology
DHL	Digital Health Literacy
DHL-E	Digital Health Literacy Expert
DHT	Digital Health Technology
DTG	Direct Target Group
DSL	Demenz. Digitale Selbsthilfe auf dem Land
EDI	Enabling Digitalization Index
eHealth	Electronic Health
eHL	Electronic Health Literacy
EHRs	Electronic Health Records
EMRs	Electronic Medical Records
EQLS	European Quality Of Life Surveys
ESF+	The European Social Fund Plus
GPs	General Practitioners

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GR	Greece
HIE	Health Information Exchange
HLS-EU	The European Health Literacy Survey
ICT	Information and Communications Technology
IT	Italy
ITG	Indirect Target Group
ISTAT	Italian Statistic Office
M-health	Mobile Health
MHL	Mobile Health Literacy
MOOC	Massive Open Online Course
MRI	Magnetic Resonance Imaging
NGOs	Non-Governmental Organizations
OECD	Organisation for Economic Co-operation and Development
OSS	Nursing Assistant/ Low trained caregivers
PHR	Personal Health Record
PIAAC	Programme for the International Assessment of Adult Competencies
PR	Project Result
SMEs	Small and medium-sized enterprises
SPID	Sistema per la gestione dell'Identità Digitale (Public Digital Identity System)
T1.1	Task 1.1
3rd age	People in third age (>65)

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Germany: Hochschule Esslingen – Alice Dorison, Reinhold Wolke

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The guideline report is compiled by Hochschule Esslingen and Wohlfahrtswerk für Baden-Württemberg.

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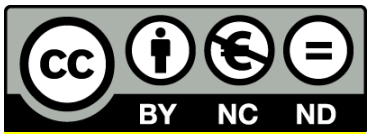

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1 Introduction

Time: December 2021 – September 2022

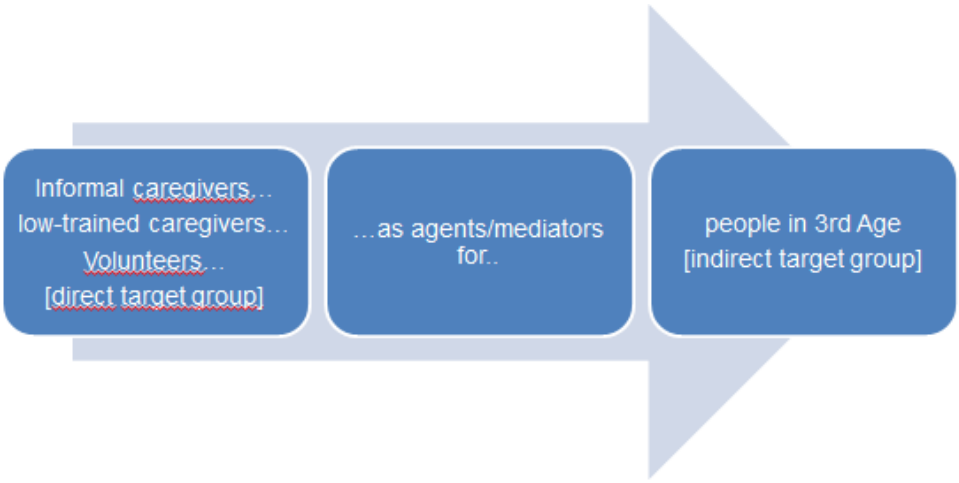
This chapter gives an overview of the goals and work of the baseline study before going on to look specifically at the individual results of each task.

Main Objective

The baseline study defined the context and the parameters upon which training content for improving and upgrading digital health literacy skills for people in third age will be based.

The baseline study is considered an important milestone at the beginning of the project, as it will guide the work that will follow regarding development, testing, production and implementation of the DIGIHALL e-learning course for the *direct* target group (low-trained caregivers, informal caregivers, volunteers).

Target groups



With regard to the direct and indirect target group of the project, the following groups in particular are in the focus of PR1 (for detailed description see Appendix I: Overview of target groups and terms):

- low trained & informal caregivers & volunteers (= *direct* target group)
- People in third age (= *indirect* target group; "3rd age")

In addition, the following target group within PR1 has been included (especially in the context of the interviews), which is not a direct or indirect target group of the overall project, but can provide an important, complementary contribution to the research questions with their expert perspective:

- Digital health literacy experts ("DHL experts")

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Leading questions

The work in PR1 and the associated subtasks was guided by overarching questions. These will be taken up, concretised and supplemented within the framework of the assignment. In the following you will find an overview of the planned focal points.

Focus	Question	T1.1 & T1.2 Literature Review	T1.3 Interview "3rd age"	T1.3 Interview low trained & informal caregivers, volunteers	T1.3 Interview "DHL-experts"
People in 3rd age (indirect target group)	What are the needs and wishes from people in third age towards digital health literacy?	x	x		x
	What barriers can be identified and how can they be tackled?	x	x		x
	Which chances and benefits do they already realize?	x	x		x
Outcome: Effect on the indirect target group **Impact: Impact in society**	How can digital health literacy contribute to health promotion and primary prevention as a way to reduce the burden of chronic diseases?	x			x
	How can digital health literacy empower the patient and tackle the functional decline and quality of life as the main consequence of chronic conditions?	x			x
	In which way can digital health literacy contribute to the	x			x

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	sustainability of health systems?				
Direct target group	What is the status and challenge at DHL of the low-trained caregivers, informal caregivers, volunteers?	x		x	
	What attitude do low-trained caregivers, informal caregivers, volunteers themselves have regarding new technologies?	x		x	
	What is the state of didactic knowledge/skill among low-trained caregivers, informal caregivers, volunteers?	x		x	
Education/Didactic (recommendations)	How can informal and low trained caregivers and volunteers strengthen older adults to adopt new technologies?	x		x	x
	What should be considered when designing training materials to enable informal, low-skilled carers and volunteers to best support the development of DHL for people in their third age?	x		x	x
	Which role has DHL in policy and educational frameworks?	x			x
	Are there existing good practices, other projects helping/empowering people in third age regarding digital health skills? In what way is DIGIHALL complementary?	x			x

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Definitions and Conceptual Framework

Joint work in PR1 requires a common basic understanding of the research subject. Therefore, based on the literature review, the following basic terms were defined.

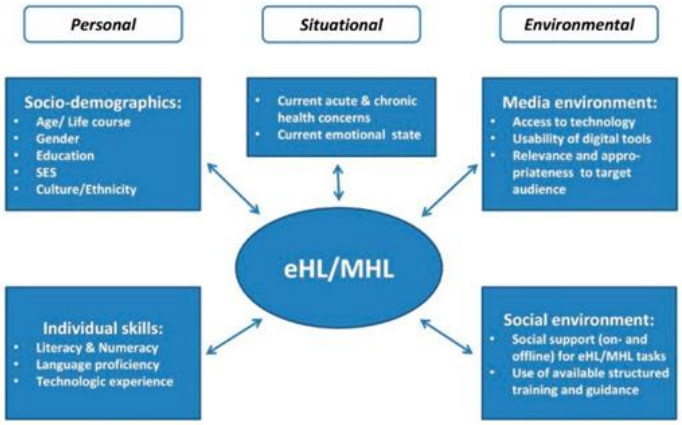
- **Definition of Health literacy**

  "Health literacy is linked to literacy and entails people´s knowledge, motivation and competences to access, understand, appraise and apply health information in order to make judgements and take decisions in everyday life concerning healthcare, disease prevention and health promotion to maintain or improve quality of life during the life course" (Sorensen et al., 2012)

- **Definition of (general) Digital Health Literacy**

  "eHealth literacy includes a dynamic and context-specific set of individual and social factors as well as technology constraints (such as the fit of a system to the user) in the use of digital technologies to search, acquire, comprehend, appraise, communicate, apply and create health information in all contexts of health care with the goal of maintaining or improving the quality of life throughout the lifespan'' (Griebel et al. quoted after, Samerski & Müller 2019, p.43)

- **Conceptual foundation:** *Broader framework General Digital health literacy (Levin-Zamir et al., 2018)*



"Growing academic attention has been given to system complexity, personal and socio-demographic factors such as age, gender, and education, social environment and context that together play a major role in shaping skills in performing health literacy related tasks in digital media environments.''

"'Caregivers' or significant others' guidance and support are thus vital in the development of abilities relevant to eHealth Literacy in context.''

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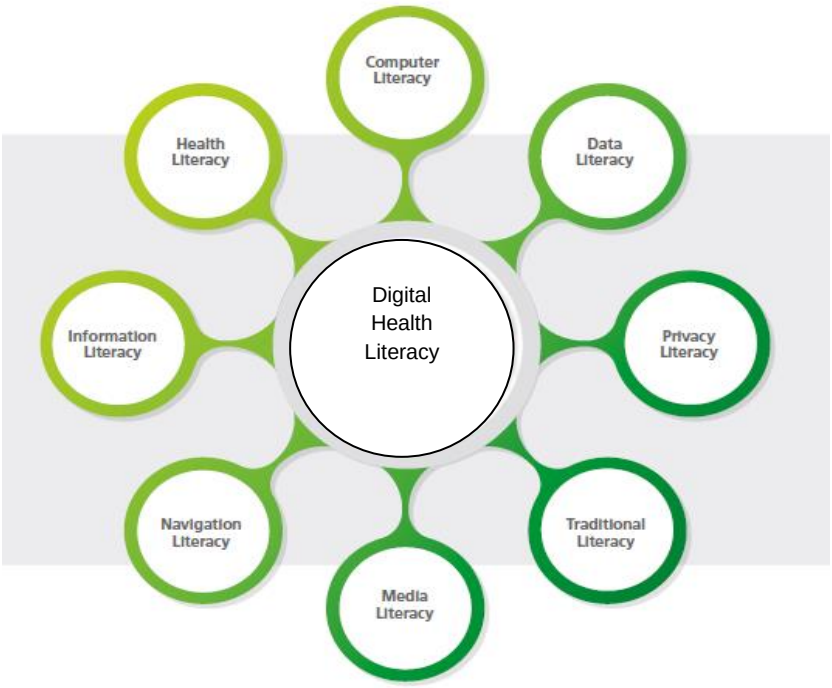
- **Specific Digital health literacy**

This is a further development of a model originally developed by Norman and Skinner (2006).

Figure 1

Dimensions of Digital Health Literacy



"These dimensions are to be applied to the dynamic context of Health, Health system and society in general. The respectively specific competences enable citizens to protect their privacy, to increase data security and to maintain and increase their health and well-being on the basis of trustworthy information (Kolpatzik, K., Zeeb, H. und Sörensen, K., 2020)".

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Figure 2

Short description of the dimensions (Kolpatzik et al., 2020).

Kolpatzik et al., 2020	
Computer literacy	Knowledge and Ability to use Computers, technologies and electronic media efficiently
Data literacy	Ability to collect, manage, evaluate and apply data with a critical mind
Privacy literacy	Competencies of data protection and technical capabilities to protect person-related data (also from manipulation and other threats)
Traditional literacy	Reading and writing skills to use informations in written form
Media literacy	Capability, that is necessary to engage in the digital media-society in an active, concious and critical manner
Navigation literacy	Ability to use the internet sovereign and competent to answer health relevant questions
Information literacy	Ability to receive, process and apply health related informations and scientific sources of information
Health literacy	Ability to handle health relevant informations

2 Tasks, Methods, Tools

The methodology referred to the development of the education and training guidelines involved different steps of research and analysis, ending up to the definition of representative case studies. Furthermore, the training needs and best practices have been explored in relation to the scope and objectives of the project.

The project partners analysed the situation in their own country, taking into account the policy drivers, as well as socio-cultural and economic influences. Wohlfahrtswerk für Baden-Württemberg, as leader of this PR1 study, was in charge of compiling and analysing the results of the individual partners and the overall methodology of the baseline study.

Task-Number	Task description	Specific tool
T1.1 & T1.2	Education gap analysis and comparative analysis ○ literature review ○ review of curricula in e.g. short trainings for caregivers and volunteers ○ identify the gaps	Literature review template with specific questions
T1.3	Interviews ○ qualitative ○ semi structured ○ 30 in total	Interview guide questions
T1.4	In depth Case studies	Condensed case studies with needs identified
T1.5	Guidelines Report and translation	Report-Template

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3 Education gap analysis and comparative analysis (literature review)

The focus in this comparative analysis lies in examining the role and significance of DHL on a national level (checking the framework of each project country) and the comparison with the European context as well as among each other. In addition, finding existing good practices regarding ways of empowering older people through DHL is part of this task. Therefor:

- A literature review in each partner country was done.
- In these national literature reviews, partners focused on the “leading questions” shown in the table above and used a template in order to provide a similar structure and therefor being able to compare the results.

The following sections present the main results for the direct target group (caregivers and thus potential future mentors for the DigiHall e-learning platform and app), the indirect target group (people over 65) and the topic of digital health literacy.

3.1 Literature review results caregiver (direct target group)

Population and statistics

Although official data about the prevalence of informal care in **Greece** is scarce, the number of informal carers as estimated by Eurofound (EQLS 2016) amounts to 34% of the Greek population, or more than 3,600,000 people.
In general, it should be noted once more that informal care in Greece is mainly provided by family and relatives, as well as by unskilled female migrant carers, mostly with informal employment arrangements (undeclared work), though the relevant updated data was not available. Yet Greece continues to lack a clearly formulated policy for the regulation of informal (paid) carers and for the support of informal family carers. Indeed, there are no provisions in Greece with regard to in-kind benefits and in-cash support for family carers. There are no benefits such as cash, pension credits/rights or allowances to compensate informal family carers for care services they provide. Family carers in Greece are viewed by the state primarily as a resource and are hardly considered to have their own need of support. The only support services available to carers are those provided by a small number of NGOs, operating mainly in Athens and other big cities and offering – among other things – information, practical advice, psychological support and group training. Most of these services target family carers of persons suffering from specific diseases, such as dementia or Alzheimer’s disease and – to a lesser extent – blindness and cancer. It is rather evident that the capacity of such services can hardly meet carers’ needs all over Greece (although no actual data are available to support this).

The majority of informal caregivers are women, that provide care to parents, parents-in-law, or a spouse, and a large share is provided by people who are older than standard retirement age (Colombo et al., 2011). The percentage of Greeks who provide informal care at least once a week as a proportion of the total population aged 18 or above is 34%, one of highest among the developed countries (Zigante, 2016).

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When there is neither access to formal care nor family or friendly environment that could provide for informal care, the only way out is hiring a professional personal caregiver. For a number of reasons, these caregivers are working undeclared. Undeclared work refers to work entirely undeclared to the state for taxation, social insurance and/or labour law purposes. This includes unregistered employees without a contract who work for a business, for a household, as family members, private tutors, or as farm workers.

Greece continues to suffer from a lack of a clearly formulated strategy and policies regarding the regulation of informal care and the support of informal carers. Indeed, there are currently no provisions concerning in-kind benefits and in-cash support for carers. There are no benefits such as cash, pension credits/rights or allowances to compensate informal carers for the care services they provide. By and large, family carers in Greece are primarily viewed by the state as a resource and their own needs are hardly considered.
The only support services available to carers are those provided by a small number of NGOs, operating mainly in Athens and other big cities and offering – among other things – information, practical advice, psychological/emotional support and training. Most of these services target informal carers of persons suffering from specific diseases, such as dementia or Alzheimer's disease and – to a lesser extent – blindness and cancer. It is rather evident that the capacity of such services can hardly meet the numerous needs of carers across the country (although no actual data is available to support this).

In **Italy** 3 different types of services for older people exist:

Domiciliary Services: aimed at guaranteeing the autonomy of daily life and preventing situations of discomfort. The service aims to: avoid the removal of the user from their living environment; supporting him in relation to the difficulties that his condition determines. In this service are employed: OSS (Nursing Assistant/low trained caregivers), Assistente familiare qualificato (Qualified in-home care attendant for elderly/ low trained caregivers), Familiari (Family Members/informal caregivers).

Semi-residential Services (Day Care Centres): they offer socialization opportunities and therapeutic treatment programs in order to maintain the residual capacities of the elderly as long as possible by supporting their functional autonomies in an extra-domiciliary care, as well as offering a care relief service for informal caregivers. In this service are employed: Infermieri (Nurse/ High trained caregiver); Educatori Professionale (Professional Educator/ High trained caregiver); OSS (Nursing Assistant/low trained caregivers); Volontari (Volunteers); Volontari del Servizio Civile (Alternative Civilian Service).

Community services for socialization and recreation: recreational, occupational and cognitive stimulation activities for the elderly, information, training and support for family members, as well as recreational and convivial shared moments. In this service are employed: Volontari (Volunteers), Volontari del Servizio Civile (Alternative Civilian Service); Animatori (Social Animators/ no trained caregivers).

Residential services: includes the reception of users in facilities and/or dedicated units and precisely: Casa Albergo (Hotel House), Comunità alloggio (Community accommodation), Retirement Home for self-sufficient elderly; Residenza Protetta (Protected Residence),

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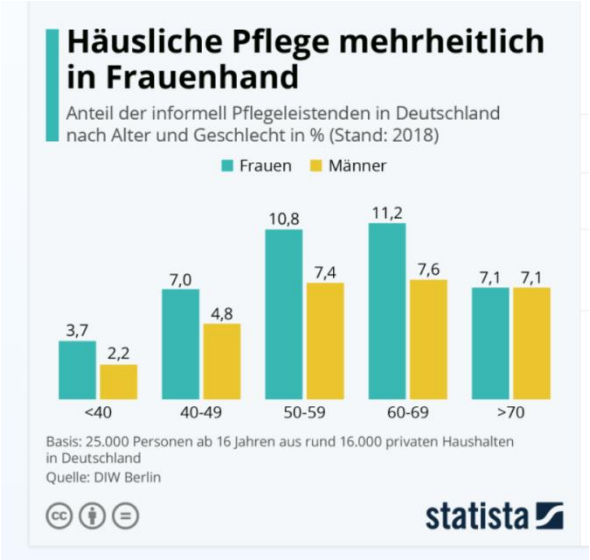
Residenza Protetta Demenze (Residence Protected for Dementia), Residenza Sanitario Assistita (Residence Health Care), Residenza Sanitario Assistita Demenze (Dementia Care Home) for elderly people who are not self-sufficient according to different psycho-physical problems. In this service are employed: Dottori (Doctors); Infermieri (Nurse/ High trained caregiver); Educatori Professionali (Professional Educator/ High trained caregiver); OSSS (Specialised Nursing Assistant/low trained caregivers); OSS (Nursing Assistant/low trained caregivers); Volontari (Volunteers), Volontari del Servizio Civile (Alternative Civilian Service); Animatori (Social Animators/ no trained caregivers) (AA.VV, 2021).

Over 50 % of the caregiving in Germany is done by relatives alone and not by professional caregivers. Most of the caring relatives in Germany are over 50 years old and women. The following figure shows the share of informal caregivers in Germany by age and gender (blue female, yellow male) in %.:

Figure 3

Informal carers in Germany



(Statista, 2022)

Caring relatives are mostly under a lot of stress. They often have to organize caregiving around their daily family and work life. Most of the relatives are aged 50 years and older and therefor have health issues themselves. There are not only differences in gender between caring relatives, also in their level of education. Caring relatives do have a lower educational background than not caring relatives; also they are more likely unemployed. Recent studies show that caring relatives more often state a reduced well-being, a high level of stress and also psychiatric diseases like depression and fear (Wetzstein M. et al. 2015).

Approximately 400.000 people are working in the field of mobile caregiving services in Germany, approx. 550 000 in elderly care homes. Thereof 46 % (mobile services) and 48 % (elderly care facilities) can be referred to as “informal caregivers”. Informal caregivers, as defined by the project consortium of DigiHall, are people working in the field of care who have less than three years of training.

For volunteers there can be found no exact data of how many are volunteering in the field of elderly care. But the Survey “Freiwilliges Engagement in Deutschland” states some interesting

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facts about volunteers In Germany in general, that can be very helpful for the project: In 2019 39,7 % of people aged over 14 are volunteering, male and female volunteers are evenly distributed. The most volunteers are aged between 30 and 49 years (around 40 %). The highest increase in the number of volunteers is among people in third age. Most of the people volunteer in Sports and Movement (13,5 %), Culture and arts (8,6 %), social field (8,3 %) and school and kindergardens (8,2 %). Around 60 % of the volunteers are using the internet for their engagement. When you take a closer look in the age structure divided by type of volunteering, you can see that people volunteering in the social field are mostly 50 years and older. Transferred to the field of elderly care it can be assumed that people volunteering are mostly 50 years and older.

Literature in all three countries shows that especially family members experience how hard caring for an older person can be, with important consequences for the psychophysical health of the caregiver himself (AA.VV.ISTAT, 2020). Problems may also arise in reconciling work and care activities in addition to the risk of social isolation when they have to take care of an elderly person who is not self-sufficient 24 hours a day.

Digitalization

Greece's performance in the "Human Capital" section is well below the EU average, although the country continues to make progress. In 2019, 51% of people aged 16 to 74 had at least basic digital skills (58% in the EU), a rate equivalent to an increase of more than 5 percentage points over a higher than the average growth rate of 1 percentage point in the EU.

The proportion of people with at least basic software skills is also growing satisfactorily, from 52% in 2018 to 56% in 2019, at a faster rate than the EU average. The same rate as in the previous three years, but remains low (1.8%) compared to the EU average of 3.9%. % and is still very low compared to the EU average (1.4%), despite a slight increase of 0.1%, which is an improvement given its stagnation over the previous three years.

https://startupper.gr/news/61997/i-ellada-ston-pato-tis-ee-oson-afora-tin-psifiopiisi/

The Digital Transformation Strategy 2020-2025 of Greece, called also the “Digital bible” is the main strategic document, which sets priorities for the digital transformation of the country, as well as goals to develop the digital skills of Greek society - at all levels and ages. The Greek Bible outlines the guiding principles, strategic axes, and interventions on a horizontal and vertical level that aim to enhance and support the digital transformation of Greek society and economy. The Greek strategy underlines 7 primary objectives as well as supporting activities across specific areas, such as initiatives aimed at citizens or the education sector.

Main objectives

- Safe, fast, and reliable access to the Internet for all.
- A digital state, offering better digital services to the citizens for all life events.
- Development of digital skills for all citizens.
- Facilitating and supporting the transformation of companies and SMEs into digital enterprises.
- Strengthening and enhancing digital innovation.
- Making productive use of public administration data.

Incorporating digital technologies within all economic sectors

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In the 2021 edition of the Digitalization of Economy and Society Index (DESI) (3), calculated by the European Commission, **Italy** remains at the bottom of the list, being 20th out of the 27 EU Member States with a score of about 5 points below the average (45.5 vs 50.7). If Italy is 20th in the DESI total, it drops to 25th for human resources, with -12 points from the European average. The gap in the 16-74 age population's digital skills is particularly marked, both at basic level (42% of 16-74 year olds vs 56% in the EU) and more advanced level (22% vs 31%).

Digitization represents a great opportunity; both for developing basic care and health skills, and to quickly obtain references, services and information (Pecorelli, Ivanovic 2012). In this way, the caregiver's care work becomes more strategic and sustainable because these technologies are intended to: promote social integration, provide emotional support, enable peer-to-peer exchange of needs, difficulties and information, and to alleviate loneliness, with the advantage of ensuring anonymity and overcoming the difficulty of participating in activities outside the home. For some caregivers, the use of these tools is the first step in the search for help on the territory (Zaidi 2015).

The **German** Digital-Index is released every year and examines the development of the degree of digitalization of the German population - their access to the internet, their digital competence, their attitude towards digitalization and their variety of use in relation to digital media and the internet. The German attitude towards the possibilities of digitalization **in General (***Digital-Index, 2021/2022)*

- 59 % of the people in Germany see an individual benefit in digitization and believe that they will benefit personally from it.
- 39 % of Germans are willing to use digital video consultation with their doctor.
- 44 % of German population remains mistrustful towards companies whose digital applications they use. Almost half of the citizens are concerned about leaving traces / personal data on the internet

Regarding digitalization the literature review showed that all three countries are working on improving the infrastructure and information about this topic but there are still many improvements necessary.

Needs and wishes regarding Digital health technologies

The **Greek** literature review states that it is very important for formal as well informal caregivers to be able to access and use valuable health information for the benefit of their care recipients. Especially informal caregivers of the elderly have deficiencies in differentiating quality health information from poor-quality and their use to make decisions, which is the main factor involved in the poor eHealth literacy of the study population. Since the family caregivers of the elderly use the internet to obtain health information, it is essential for this group to acquire the necessary knowledge about searching and assessing online health information, so that the risks of using incorrect medical information can be eliminated, because using incorrect information may increase the economic burden on the patients and health systems. It is also necessary for health professionals to raise elderly caregivers' knowledge and help them in identifying reliable information sources. Experts should also introduce websites containing quality health-related

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information to caregivers, so that they can use the information provided through reliable and quality websites to provide the elderly with care services.

In **Italy** the needed support can be divided into various forms: from specialist support to economic support through the emotional sphere. The informal caregiver must be guided in his or her care path.

Informal caregivers were faced with a sense of guilt for the institutionalization of the family, which is why emotional support is essential. Continuity in communication between professionals and family members is seen as important for both family support and good nursing care at home and in a nursing home.

Informal caregivers should be supported in their choices and involved during the implementation and also during the device design to have an effective awareness of the instrument that they will use to assist (e.g. elderly people). The use of technological tools is now fundamental for the user because, in the social and relational context, they promote the maintenance of his well-being. An acceptable level of digital literacy is now indispensable for caregivers, be they formal or informal. Allowing the patient to make the most of all the services offered in the national healthcare panorama cannot ignore a concrete digital competence on the part of the caregiver. An example: the request for transport by ambulance that is made by e-mail or the use of the SPID (in Italy) which has become fundamental for the whole society today.

In Germany no specific literature was found.

3.2 Literature review results older people (indirect target group)

Population and statistics

In **Greece** the share of people aged 65+ is expected to grow from 22% to 33.8% (EU-28: 20%-28.5%) in the period 2019-2050, with most of the growth happening before 2032. At the same time, the share of people 85+ will more than double from 3.3% to 7% (EU-28: 2.7%-6.1%). Over the same period, the old age dependency ratio measured as the percentage of 65+ compared to the population of 15-64-year olds will rise from 34.1% (EU-28: 30.5%) to 67.1% (EU-28: 55.3%). Life expectancy for men and women at age 65 is projected to rise from 18.6/21.4 years (EU-28: 18.1/21.4) in 2017 to 22.6/24.6 years (EU-28: 22.4/25.6) in 2060. From 2005 to 2012 healthy life expectancy for men and women decreased by 1.1 and 2.7 years, respectively.
Currently 22.6% of the entire **Italian** population is 65 years old or older. From a demographic point of view, the Italian population is "three times older" than the world population, whose percentage of elderly people is around 7%. According to ISTAT (Italian Statistic Office) projections, in 2050 the elderly people will become more than a third, that is to say 20 million people, of whom more than 4 million will have more than 85 years old. In Italy for some time, we have witnessed a constant and progressive aging of the population as evidenced by ISTAT (period 2002/2019). In Italy from 2002 to 2018 the number of "elderly" citizens (65 + years) increased both in absolute terms and in percentage terms, from 10,654,649 million in 2002 to 13,644,363 in 2018 with an increase of 2,989,612 million elderly citizens.
In **Germany** the number of people in the age of 65 and older between 1990 and 2018 increased by 50 %. It is expected that this development will go on in the next 20 years. Mainly responsible

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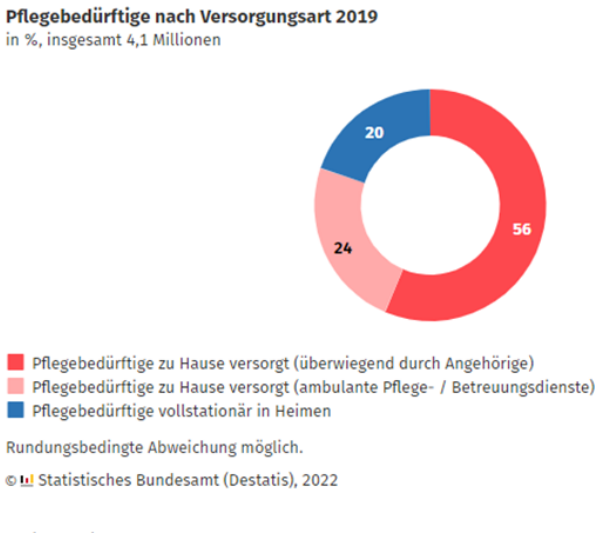
for this development is the increasing life expectancy. Because of this it is expected that especially the group of high age (85 years and older) is growing (DeStatis, 2022).
And although health impairments can arise with increasing age: Many people rate their own health positively into old age. In 2019, 42% of people aged 65 and over in Germany subjectively assessed their own state of health as good or very good. Conversely, 14% of the 65-year-olds and older reported their state of health as bad or very bad in 2019 (2009: 15%). This proportion is clearly declining, especially among the very old: In this group, almost every third person subjectively assessed their own health as being poor (33%) (DeStatis, 2022).
Most people in third age are living in partnership (mostly people between age 65 and 85) or alone (mostly people in high age). Living together with people under 65 is rather rare (DeStatis 2022). Also, the number of women in old age is much higher than the number of men due to a higher life expectancy (DeStatis 2022).
In December 2017, 3.41 million people in Germany were in need of care within the meaning of the Long-Term Care Insurance Act (SGB XI). As the Federal Statistical Office (Destatis) also reports, the number of people in need of care was 2.86 million in December 2015. The strong increase of 0.55 million people in need of care (+ 19%) is, however, largely due to the introduction of the new, broader definition of long-term care from 01/01/2017. Since then, more people have been classified as in need of care than before the changeover.
80% of all those in need of care are cared for at home. 24 % of these are cared for by caregivers at home, 56 % are cared for by relatives. Only 20 % of people in need of care are cared for in a nursing home:

Figure 4

Persons in need of care by type of care 2019



Destatis, 2022

Digitalization

In **Greece** the digital divide and the differences in the frequency and the manner in which the internet is used highlight the inequalities between the general population and the groups vulnerable to social exclusion, which are now also facing the risk of digital exclusion, therefore,

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dual exclusion. These groups include individuals aged over 55 years, who may not still be active in the labour market, but lack digital skills, at an average rate of 69%.
During the last decades, the older adults' population has constantly been growing. However, technology adoption still lacks compared to younger generations and, notably, older Greek adults are one of the groups that are the least connected to the Internet compared to their European peers.
Based on the literature, it appears that culture and psychosocial attributes can affect users' perceptions upon several issues, ranging from feelings of loneliness to technology usability and acceptance.

In **Italy** the leap made by the elderly towards the possibilities of digitalization is important, more than 37 percentage points compared to 2007. This result was possible thanks to the increasing level of education and digital literacy of older people, and also for the spread of smartphones, the low-prices costs of access to services and the upgrading of the infrastructure. However, the use of the internet in Italy remains strongly linked to age. Only among the 65-year-old graduates the use of the network has values similar to those recorded for the Italian average, 61.3 percent. If the indicator on the usage of ICT gives us a positive result of gradual progress, the digital gaps between individuals arise not only in relation to access to ICT, but also in the ability to use and benefit from it. Certainly, with the arrival of the baby boomers generation, it is likely that these differences will decrease, but it will still take time for the internet to become, even for elderly people, an integral part of everyday life (Foster, Walker 2015). Much remains to be done to further reduce the digital gap, for example by improving digital literacy through programmes aimed at older people who promote the use of the internet, reducing the obstacles arising from old age and lack of resources.

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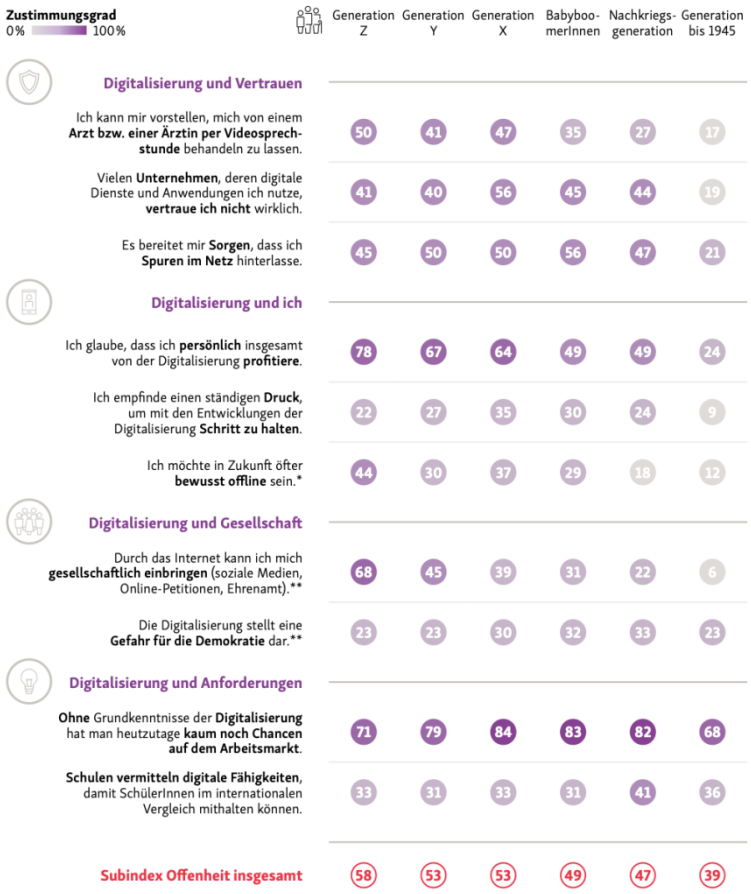
The attitude towards the possibilities of digitalization of older people in **Germany** is shown in the following picture. The first topic is digitalization and trust. 17% of people born before 1945 and 35% of the baby boomer generation can imagine using telemedicine. Also the older people get the less they believe they can benefit from digitalisation (78% Generation Z 24% people born before 1945) (*Digital-Index, 2021/2022.).*

Figure 5

Assessment of the digitization of the different generations



Digital-Index, 2021/2022

50 % of the “offliners” in Germany come from the generation up to 1945 and are thus 76 years old or older. Compared to 2020, the average age has risen by another two years and now stands at 71 years. In addition, seven out of ten people who do not have access to the Internet are female, and almost 80 % have a low level of education. As a result, but also due to their frequent pension status, more than 50 % have a low monthly net household income of up to 2,000 €. This means that the concentration of “offliners” in the above-mentioned groups is becoming even more concentrated (*Digital-Index, 2021/2022)*

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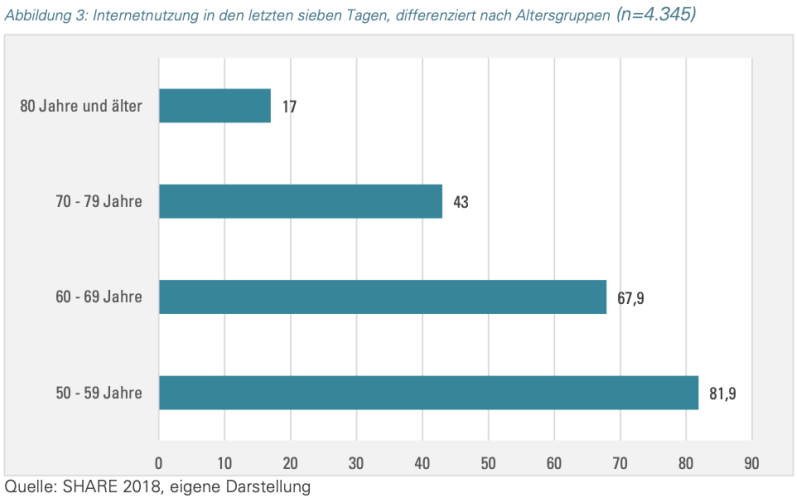
The next diagram shows the internet usage in the last seven days differentiated by age, also showing the decrease of usage the older people are (Cirkel, Enste 2019).

Figure 6

Internet usage in the last seven days



Quelle: SHARE 2018, eigene Darstellung

Needs and wishes regarding Digital health technologies

Considering the specific barriers and facilitators that influence the use of e-health by older adults is critical to improve their use of e-health programs, and to realise the potential of technology to ameliorate the challenges associated with traditional healthcare for this group. Findings from relevant reviews suggest that older adults are more likely to use e-health services that are cognizant of their physical and functional needs, provide appropriate education and training to engage with e-health, address previous negative experiences of, and misconceptions about, digital health technologies; and employ strategies to enhance the perceived trustworthiness and credibility of e-health. Concerning the barriers faced by older adults in their approach to DHL, it is possible to mention several researches in which results from different papers have been analysed and synthesized.

In the review from Wilson et al including data from 14 papers, “the barriers and facilitators to older adults accessing e-health” were each mapped into five thematic categories:

- individual, including intrinsic and extrinsic;
- technological, including functionality, content, and availability;
- relational, including technological support and social support;
- environmental, including location; and
- organizational, including privacy, trust, and the sharing of data’.

One of the major barriers is related to older people’s motivation towards technology: indeed, scholars have identified a lack of interest in technology, a fear of using technology, a fear of dislike technology and a feeling of incompetence as some factors preventing the elderly from

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using e-health. Within the Italian framework, a case study has found that “the unwillingness to learn new media literacies ranged from ‘’laziness’’ to a self-perception of being unable to learn” and that “many of the Italian respondents stated that they did not need to learn more about the use of new technologies (12%)”. This lack of motivation is often associated with an incorrect assessment of the opportunities offered by a technological device, which can lead to consider the device in an excessively positive or negative way and to a lack of awareness of e-health opportunities, a disbelief in efficacy of e-health, a lack of confidence and a preference for traditional health care services. Also the individual experiences with technology can influence older people’s attitude: previous negative experiences and unmet expectations represent a barrier towards the use of e-health (Wilson et al, 2021; Whitelaw et al, 2021; Carenzio, Ferrari & Rasi, 2021).

Intrinsic barriers mainly include physical, sensory, intellectual ability, and motivation. Physical ageing is the most prevalent barrier to accessing e-health, with hearing and sight limitations being the most common. Concerns also refer to memory particularly with remembering passwords, and the acquisition of new information. Additionally, the reduction of fine motor control (i.e., trembling hands) makes it difficult to interact with devices, particularly those with small screens. Perceived self-efficacy regarding the use of technology focuses on:

- the difficulties of using technology and e-health;
- concerns about the use of digital mental health technologies; and
- feelings of incompetence

Additionally, some other internal barriers exist, such as computer anxiety, lack of self-esteem, lack of self-efficacy, lack of personal motivation, lack of computer interest and efficacy, and attitudes towards the aging experience regarding psychosocial loss and psychological growth, poor acceptance and compliance, reliance on health professionals for information, emotional barriers (shock, fear, anxiety), and avoidance of information.

People in this age group tend to experience more stress and anxiety regarding the learning process than the younger generation. Physical barriers, such as vision or hearing problems, were identified as other challenges faced by elderly people. Moreover, a low level of education among the geriatric population represents another important limitation in their efforts to deal with e-health, m-health, or other digital health services.

The investigations carried out by scholars have shown that older people’s wishes and needs towards DHL are often linked with the necessity of being more autonomous, of better managing health issues, of perceiving a sense of self-efficacy and control over their lives. In order to meet these needs and expectations and to tackle the barriers associated with a lack of motivation, it is essential to stress the chances arising from an improvement of DHL skills.

In general, older people using technological resources show relevant improvements concerning the knowledge of their health status and a greater sense of control and confidence, which ensure better clinical outcomes and technology has been proven to be useful in managing health issues or coping with symptoms (Bevilaqua et al 2017) and as a medium for therapy, in rehabilitation and in health status assessment, monitoring and self-management (Valokivi et al 2021).

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Among the individual extrinsic factors which can facilitate the use of e-health by older adults, there are the perception that e-health services are of benefit, the convenience of e-health, the opportunity to learn new information and the ability to incorporate e-health into participant routines.

The results of all three countries show that digitalization and digital health technologies are important topics but that especially for older people it still seems far away or abstract and they do not see the benefits for their daily lives.

3.3 Digital Health Literacy

Ten years after the first European study on Digital health literacy (HLS-EU) in eight EU countries, the results of the second European study on health literacy (HLS19) are now available based on the experiences of 42,445 respondents in 17 countries in the WHO European region (DESI 2022). Many OECD countries are implementing electronic medical records (EMRs) in hospitals or physicians' offices for their patients (Oderkirk, 2021). In 2021, on average 93% of primary care practices use EMRs across 24 OECD countries. In 15 OECD countries, all primary care practices use EMRs, while in Japan only 42% use them. In 16 of 26 OECD countries in 2021, most patients are able to access an Internet portal where they can view information contained in their EMR. In 11 OECD countries, most patients can also interact with their record (such as by amending information; adding additional data from devices or apps; or reporting outcomes, experiences or clinical incidents). About half of the countries connect patients with their health care providers via a patient portal that facilitates teleconsultations (13 countries), video-conferencing (12 countries) and secure email or text messaging (11 countries). Seven countries also use the portal to survey patients about patient experiences and patient-reported outcomes. Consulting individuals on their care and giving them access to their health data and information are key dimensions of people-centred health systems. Both patients and providers are increasingly interested in using digital tools to improve individual health and help patients engage with health systems. On average across 30 OECD countries, in 2020, 59% of individuals aged 16-74 used the Internet to seek health information in the three months preceding the survey, up from 36% in 2010. However, there were e significant demographic and socio-economic differences in seeking health information online (Oliveira Hashiguchi, 2020). Older adults, individuals with lower levels of educational attainment and those from households with lower incomes were less likely to search for health information online. Health and digital health literacy are crucial to guarantee that the digital transformation leaves no patient behind (OECD 2021).

In the Digital Evolution Index (DEI), **Greece** was ranked 38th among the 60 countries surveyed for 2017. In the Enabling Digitalization Index (EDI), Greece was ranked 43rd among 115 countries for 2019. According to the above, Greece, although lagging behind the rest of Europe, has taken some steps in its effort to digitally transform its health sector. According to the study, the relevant efforts began in 2018 with the establishment of the Health Technology Evaluation Committee, while a positive development is the creation of a register of patients for certain treatment categories such as: hepatitis C, demyelinating diseases of the central nervous system, thalassemia, peritoneal dialysis, diabetes mellitus, chronic myelogenous leukaemia and

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the recent establishment of a Covid-19 Patient Registry. Nevertheless, Electronic Prescribing, although successfully established (50,000 certified physicians, 12,800 certified pharmacies, 6,000,000 prescriptions / month, 2,000.00 referrals / month, 3,000,000 insured / month), remains untapped in terms of the wealth of information that contains.
Also, the operation of the application of emvolio.gov.gr, the (albeit limited) utilization of telemedicine solutions for remote areas compose a solid mix of measures which, although designed and implemented in the suffocating conditions of the pandemic, is a strong legacy for the next day.
Research by the European Commission's Directorate-General for Communication Networks, Content and Technology (DG Connect) which examined the adoption and use of digital technology (e-Health) by general practitioners (GPs) in primary health care (e-Health adoption Index) shows that Greece lags significantly behind in the use of digital technology and the adoption of modern technologies in the health sector is compared to other EU countries.
A random sample of 5,793 general practitioners was examined and statistical analyzes of the collected data were performed which showed that, in total, the adoption of e-health in primary health care in the 27 EU Member States has increased from 2013 to 2018, but there are differences between the countries surveyed.

Specifically, the research examines four sub-indicators: The use of Electronic Health Records (EHRs), the adoption of electronic information exchange (Health Information Exchange - HIE), the use of telemedicine and the development of a Personal Health Record (PHR). Based on the results in each sub-index, an overall index for the adoption of digital health is created. Greece is ranked 23rd among 27 EU countries with 1,785 points.

Electronic File: In the penultimate position (26th) is based on the index for the adoption of electronic file (EHR) for patients. Specifically, he scored 2,297 when the average is 3,196.

Electronic exchange of information: Third from the end (25th place) is the country in the index related to the exchange of information on clinical data, the appointment of health services and the level of exchange of health information between health care providers and public bodies with patients. Specifically, Greece scores 1,464 when the average of the 27 countries stands at 2,070 points.

Telemedicine: Greece is doing well only based on the telemedicine index where it is in 8th place with 1,808 points when the average in the EU. is 1,639. In fact, it achieves this "good position" because in the criterion training / consultation through teleconferences, it achieves a score of 2,200 with an average of 1,861 occupying the 5th position. But also in the criterion for long-term follow-up of patients it is in the 13th position a little above the average with 1,431 points.

Personal health file: In this category, Greece is in 16th place among 27, but note that only 8 is above average, which rises very high from the 5 countries with top performance. Greece also achieved a score of 1,389 points when the average is 1,568.

In **Italy**, the total percentage of the 3500 respondents who selected “very difficult” or “difficult” questions from the common 12-item questionnaire (HLS19-Q12) is 31%, compared to an average 23% of the other 17 countries; 53% answered “difficult” and 16% “very easy”.

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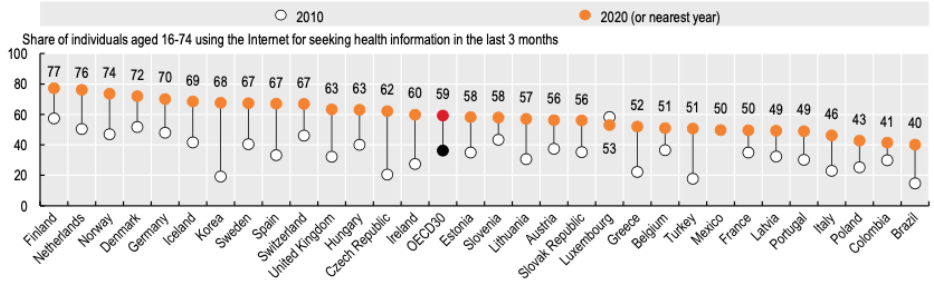
This means that 23% of people have inadequate Health Literacy levels, 35% with problem', 34% with sufficient' and 9% with excellent'; the corresponding percentages in the total sample of the 17 participating countries are 13%, 32%, 40% and 15%.

Given the emergence of the COVID-19 pandemic, Italy has added a specific form of 16 questions concerning difficulties in finding, understanding, evaluating and making decisions based on available health information, from which it emerged that 6% responded very difficult, 25% difficult, 52% easy and 17% very easy.

Adults in **Germany** show around average proficiency in literacy, numeracy and problem solving in technology-rich environments compared with adults in the other countries participating in the survey. As in most countries, a significant minority of Germans have very low proficiency in literacy and numeracy, and a large proportion of adults show poor proficiency in accessing, analysing and communicating information using common computer applications (PIAAC 2012). The following figures give an overview of digital health literacy in general.

Figure 7

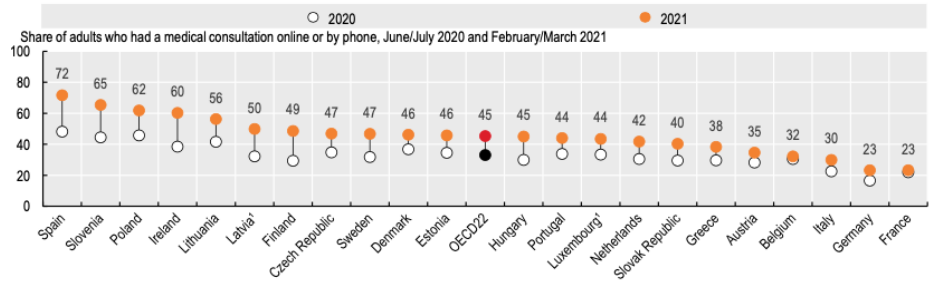
Figure 5.14. **Percentage of adults searching for health information online, 2010 and 2020**



Note: The most recent data point for Poland is 2018, and for Switzerland, Mexico and France is 2019; the earliest data point for Mexico is 2015.
Source: OECD Dataset on ICT Access and Usage by Households and Individuals.

StatLink https://stat.link/okemdz

Figure 5.15. **Share of adults who received services from a doctor via telemedicine since the start of the pandemic, 2020 and 2021**



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Another study found that people with very good or good health have higher digital health literacy than those with mediocre to very poor health. 48.3 % of respondents find it difficult to distinguish reliable from unreliable information on the Internet. Four out of ten find it "difficult" or "very difficult" to judge whether the information is being disseminated with commercial interest. Many people are overwhelmed by the amount and variety of information available on the Internet. They find it difficult to assess the reliability of information and to recognize potentially economic interests. There are also frequent problems with protecting privacy and data protection and with finding their way around the Internet. Thus, the difficulties come from completely different areas, which are also clearly to be found outside the healthcare system (AOK Study, 2020).

Role of DHL in policy and educational frameworks

There is a need for an EU Joint Action of Member States and experts on improving digital health literacy for all, as part of a comprehensive implementation strategy and plan within the EU Digital Strategy with funds from programmes including ESF+, Horizon Europe, and InvestEU.

At European level, the European Commission has incorporated within the framework Of Digital Single Market, actions related to the access to secure and quality digital services in the field of health and care, setting three priorities for tackling demographic ageing, increase of the costs of health services, but also the rising of informed citizens seeking better health services:

1. Citizens' access to their personal health data, access that will be possible throughout the EU

2. Personalized medication through common European infrastructure, data and computing power

3. Empowerment of citizens with digital tools that will help them in disease prevention and control, and will provide valuable information to health care providers for a comprehensive, preventive and curative treatment.

Taking into account people in the "16-74 years old" range, ISTAT notes that for ***Italy***: 29% have high digital skills, 26% have enough basic digital skills but that, unfortunately, 41.6% of citizens do not reach basic skills and, even worse, 3.4% (just over a million people) has no digital skills.

In this regard, the preparation and launch of the "Operational Plan of the National Strategy for Digital Skills" is an important and ambitious action that, as the primary objective of the Strategy, should lead us back to our country (Italy), by 2025, at the level of other EU Member States: Germany, France and Spain.

The Plan was conceived and implemented within the framework of "Repubblica Digitale" (2019), a concrete national strategic initiative promoted by the Department for Digital Transformation of the Ministry for Technological Innovation and the Digital Transition, which aims to combat the digital divide of a cultural nature present in the Italian population, to support the maximum digital inclusion and encourage education on the future technologies, accompanying the process of digital transformation of the country.

The objectives of the Plan, to be achieved by 2025, are multiple. Below are those who are qualitatively and quantitatively more important in order to place our country at European Level:

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1. to reach 70% of the population with at least basic digital skills, with an increase of more than 13 million citizens since 2019 and to eliminate the gender gap;

2. duplicate the population with advanced digital skills (with 78% of young people with higher education halving the gender gap, 40% of workers in the private sector and 50% in public sector);

3. triple the number of ICT graduates and quadruple the number of female graduates,

4. duplicate the share of companies using big data;

5. increase by 50% the share of SMEs using ICT specialists;

6. increase the share of the population using public digital services by five times, bringing it to 64% and bringing Internet use to the levels of the most advanced European countries, even among the least young.

It is also important to know who the „target groups“ of these actions are.

In this regard, the Plan indicates a significant presence of initiatives that address simultaneously several categories: citizens, workers of public administrations and enterprises. Most of the projects target citizens (over 54%), and specifically target high school and university students.

The Plan also specifies that there are still few initiatives aimed at the population with factors of disadvantage (low level of education included) and adults over 65, population groups in which the risk of digital exclusion is greater: in the 65-74 cluster only 14% have basic digital skills.

German policy makers have understood the urgency of improving DHL. The National Action Plan on Health Literacy shows the following:

The social relevance of digital health literacy is now obvious, as digitization is advancing rapidly in all areas of life - including healthcare. Digital health literacy, i.e., the ability to search for and find relevant health information on the Internet, to understand it, to assess its reliability, and to implement it, is poorly developed among the population in Germany: more than three-quarters (75.8%) of the population has difficulty finding digital health information and dealing with it appropriately. Thirteen percent of the population state that they have no difficulties at all in this regard and digital health literacy can be classified as sufficient for a further 11.2% (Nationaler Aktionsplan Gesundheitskompetenz, 2021).

3.4 Good practises and other projects

"Access to the Digital World" project improves the digital skills of older adults in **Greece**.

With the cooperation of COSMOTE, AGE Greek member organisation 50plus Hellas contributes to the development of technological skills of older people with the program "Access to the Digital World". Under the motto "Become digital", the program has been running since 2012 and aims to promote lifelong learning and improve the quality of life of older people. By the end of 2017 over 7500 people will have been trained to use new technologies in Greece under the supervision and know-how of 50plus Hellas.

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For this year, 4 educational centers operate in total in the Attica area. All the participants learn how to use the tablet, navigate the internet, enter the "world" of social media, and use applications to make their everyday life easier (notes, calendar, notifications, webcam, maps e.t.c.). The project "Access to the Digital World" has been covering the need of digital literacy in the population of people over 50 in Greece in the last 5 years with great success and will continue to do so with new ideas being implemented and developed every year by the experts of 50plus Hellas and the contribution of COSMOTE for as long as possible.

In the Italian context, it has to be mentioned the “National Strategy for Digital Skills” and its “Operational Plan” divided into 4 strategic axes (Higher Education and Training, Workforce, ICT specialist skills, Citizens), the Plan includes lines of intervention, more than a hundred actions related to the objectives and the priorities of the Strategy and its implementation timeline (2020-2027).

Concerning people in third age, the Plan aims at promoting the digital inclusion, reducing the digital divide and encouraging the digital skills acquisition.

In “Asse IV”, the focus is on the digital inclusion/access for the elderly and on the identification of gradual objectives and specific actions, which can involve also those who act as facilitators towards the community in different areas and who can better facilitate the transition to digitalization (librarians, operators of employment centres, of centres for older people, of social care centres,…).

In this regard, the Operational Plan sets a specific objective to be achieved, linked to the role of those who act as mediators in the digital skills acquisition process: “rafforzare le competenze dei ‘mediatori’ e dei ‘facilitatori’ digitali”.

Among the key actions designed for the elderly, there are courses aiming at expanding the training opportunities on digital skills, the creation of the platform “Adulti in formazione”, the “Piano strategico nazionale per lo sviluppo delle competenze della popolazione adulta”, digital facilitation networks, houses of innovation/of digital culture, communication initiatives aimed at promoting the knowledge of the digital culture, the institution of the “National Day of Digital Literacy” (“Giornata nazionale per le competenze digitali”) and the organisation of information and communication campaigns.

In **Germany** through the Federal Development Program (Bundesprogramm Ländliche Entwicklung, BULE), the BMEL is funding the development of digital applications, some of which are explicitly aimed at people in third age, as part of the "Land.Digital" announcement. For example, various apps and platforms are being funded that enable networking and targeted support for elderly people ("DorfWohnen.digital" by Lia LebensForm GmbH, "Mein Rhein-Lahn-Kreis 55plus" by the FernUniversität Hagen, "Smartes Wohnen im Alter" by the Cochem-Zell district administration). In the "DSL" project, the association Ländliche Erwachsenenbildung in Niedersachsen e.V. is developing a care robot as well as digital aids, for reducing age-related loneliness as well as medical and nursing support. The communication platform Vrees is also supported by "Land.Digital": it not only supports the dialog in the village, but also enables people to remain in the village and at home for life through Ambient Assisted Living.

The special BULE project "NeaWiS", in which the Ansbach University of Applied Sciences is developing a platform for better exchange and communication of information between those

affected (seniors and family caregivers) and service providers about existing care structures for people in need of care and assistance (Achter Altersbericht, 2020, p. 14).

The “Digital Angel” promotes participation in social life and enables a self-determined lifestyle in third age. By addressing elderly people personally, it teaches them how to use digital options safely in their everyday lives and how to use digital services and devices competently in almost all areas of life - from online shopping to social interaction to matters of health. A mobile outreach team enters direct and personal dialog with elderly people. The Digital Angel can address specific questions and fears on site and provide suitable solutions and skills. https://www.digitaler-engel.org

The analysis of the existing good practices and projects related to digitalization and people in third age within the Italian but also Greek and German context shows that the majority of the initiatives are of two kinds: those helping the elderly to acquire digital skills (but not specifically related to DHL) and those encouraging health promotion thanks to the use of digital devices (but not considering the DHL skills acquisition). So with DIGIHALL on the one hand we will try to speed up the process of having more people engaged into existing practices and on the other hand we address to domains uncovered by the existing good practices and projects.

DIGIHALL aims at fostering health promotion for the elderly by helping them to acquire specific skills related to DHL: the learning process involves the caregivers, who act as mediators (in fact, as it can be seen at the point 5 of this literature review, caregivers are often facilitators to the use of e-health by older adults).

Results of this review offer clear evidence that DIGIHALL meets the national objectives of promoting the digital inclusion of the elderly and supports them in their DHL skills acquisition and in their use of e-health.

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4 Interviews

4.1 Overview

Based on the results of the literature review and education gap analysis semi-structured interviews in each partner country have been conducted with people in third age, informal and low-trained caregivers, volunteers and also digital health experts. The aim was to fill the gaps that have been identified throughout the literature review and to get a better understanding/overview of the status quo of the digital health literacy among people in third age, especially regarding their needs and how their competencies can be improved - from their concrete everyday life and experiences. Therefore it was important to interview all three target groups in order to get an overall view regarding the topics they find relevant. The purpose of the interviews is to contribute to the needs analysis planned for the stipulation and development of the right educational and training content for the direct users.

The main goal of the interviews with people in third age was to get a deep insight regarding their attitude and current approaches to digital health as well as identifying training needs of DHL agents.

The main goal of the interviews with the low trained / informal /volunteer caregivers was to get a deep insight regarding their own attitude, status and challenges to digital health as well as their didactical skills on one hand and their ideas of how they can strengthen DHL for elderly on the other hand.

The main goal of the interviews with the experts was to identify requirements for the planned training methods and to explore their perspective on the impact of improved DHL skills for people in third age with regards to quality of life or wellbeing.

Data collection

The data (30 interviews) has been collected between June and July 2022 from 4 partners (Wohlfahrtswerk für Baden-Württemberg, Hochschule Esslingen, FRONTIDA Zois, Cooperativa COOSS MARCHE) in 3 countries: Germany, Italy and Greece. The results of the interviews were translated into English by the partners and analysed by Hochschule Esslingen and Wohlfahrtswerk für Baden-Württemberg.

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All together the partners interviewed 9 people of the indirect target group (people in 3rd age), 12 of the direct target group (caregivers/volunteers) and 9 digital health experts. The distribution has been per countries:

Country Semi-structured interviews	Greece	Italy	Germany
Indirect target group (People in 3rd age)	3	3	3
Direct target group (Low-trained caregivers, Informal caregivers, Volunteers)	4	4	4
With digital health experts	3	3	3
Sum	10	10	10

It was important to take the current COVID-19 Situation into account. Therefore, the interviews could be conducted via phone or via online Meeting-platforms. If the partners decided to conduct the interviews face to face, the standards of hygienic measures of the concerning country have been fulfilled.

Participants

Participants in the interviews (people in third age, low-trained/informal caregivers & volunteers and DHL -Experts) were selected through the local network of each project partner.

In general participants were selected by:

- Type (people in third age, low-trained/informal caregivers, volunteer and DHL- Experts)
- Age (people in third age had to be at least 65 years old)

Descriptive data

The detailed tables showing the descriptive data for each country are available in *Appendix II: interview participants*

Direct target group

As volunteers, informal and low-trained caregivers are the direct target group to use the upcoming learning platform; they were interviewed to discover their experiences and opinions on using DHT and also interacting with people in third age. In total, 12 participants (8 female) could be declared as part of the direct target group, including two volunteers, six informal caregivers and four low-trained caregivers. Four of the participating caregivers were under 30 years old, two were between 30-50 years old, three were between 50-65 and one was between 65-74.

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Five interviewee`s have been giving care between 1-5 years. The other participants responded that they gained experiences in giving informal care through their job in either less than 1 year (2 persons) or 11-20 years (1 person).

Indirect target group

Regarding the indirect target group, 9 persons (5 female) over the age of at least 65 years were interviewed to discover their needs and opinions on interacting with DHT. The aim was to strengthen the findings and hypotheses from the literature review. One care receiver was above 85 years old, two participants were between 75-84 and six participants have been between 65-74. Seven of the interviewee´s who actually received care in a certain way, four did so for 1-5 years; all other participants answered that they don't need any support in the current situation.

DHL-Experts

To get an overview of existing and similar projects and to learn from the expertise in the field of DHT 9 DHL-Experts (2 female) have been interviewed. One participant was under 30, four were between 30-50, two were between 50-64 years old and another two were between 65-74 years old.

Ethical issues

Participants had to sign the informed consent after being notified and informed about the scope of the Digihall project and agreed to participate in the project of their own free will. They understood that the agreement involved participation in an interview which aimed to identify the training needs analyses of Digihall project. Participants were informed that they can withdraw their agreement at any time and that they can refuse to answer certain questions during the interview.

4.2 Interview guidelines

An interview is an information-gathering technique particularly useful for getting in-depth information around a topic (e.g. user requirements). In the next lines a guide approach is presented which intended to ensure that the same general areas of information are collected from each interviewee and we gather comparable data; this provides more focus than the conversational approach, but through open-ended questions we will still allow the respondent a degree of freedom to choose how to answer a question, and an adaptability in getting information from the interviewee.

If interested, the exact procedure can be found in Appendix III

4.3 Data analysis

In order to provide comparable data, not only while conducting the interviews, the following aspects were described for all partners.

Transcription: As a general rule interviews are being taped. Transcriptions of thematically relevant passages are a prerequisite for the analysis. A transcription of the whole recording – in contrast to working with biographical interviews – is not standard. The transcription is also less detailed; prosodic and paralinguistic elements are notated only to a certain extent.

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Paraphrase: The sequencing of the text according to thematic units is easily done, as it were, in the manner of common sense reasoning. In order to rule out a narrowing of the thematic comparison of passages from the different interviews – the next but one step in the analysis – and to avoid to "give away reality," the paraphrase should follow the unfolding of the conversation and give account of the interviewee's opinions.

Coding: The next step in condensing the material is to order the paraphrased passages thematically. The interpreter keeps close to the text and adopts the terminology of the interviewee. At best a term or phrase can be used as it is. Whether one or more coding categories are attached to a passage depends on how many topics are addressed. It is allowed and necessary to break up the sequentiality of the text also within passages, since the subject matter of the analysis is not the totality of the individual person's life. The frame of reference at this stage in the analysis still is the single interview; condensations, typifications, abstractions remain within its horizont.

Thematic comparison: From this stage onward the analysis surpasses the single passage in the text. The logic of the procedure corresponds to that of coding, but now thematically comparable passages from different interviews are tied together (cf. Nagel, 1986). Category formation close to the language of data has to be maintained; theoretical abstraction should be refrained from, if possible. Since in the course of the thematic comparison a large amount of data is condensed, it is essential to check and if necessary revise coding decisions. The results of the thematic comparison have continuously to be checked in the light of the other relevant passages in the interviews, to examine whether they are sound, complete and valid.

4.4 Interview Results

Following you find a summary of all interview results. If you are interested in more details from each country you find an overview in Appendix IV.

4.4.1 Direct target group (low-trained, informal caregivers and volunteers)

Perspective I direct target group: status/experience

1. Describe in what way you have contact with people over 65 in your professional or private everyday life, e.g. also in an honorary capacity.
Summary: The interview participants have contact with the indirect target group (people over 65) through their following roles/functions: Volunteer: through alternative civil service or through volunteering. In particular, the interviewees from Germany report that they offer explicit advice to people over 65 on various digital technologies. Informal caregiver: The participants from Greece in particular all four described themselves as informal caregivers who either care for their partner or their parents. Low-trained caregiver: Here the participants report which components their job has: "*I have to listen to the needs, our coordination job is to elaborate these needs*" (IT).

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Overall, parents are also frequently mentioned as points of contact with people over 65 in the private sphere or one's own parents are also cared for, which is not surprising in view of the demographic development in the interview countries.

2. Describe where you have gained professional or private experience with digital health technologies.

Summary:

Some of the participants from Germany, but also Italy, mention the effects of the Covid pandemic as a point of contact with DHT: "*This course [using my tablet] was on how to manage the Covid emergency situation, hygiene and how to dress elderly people without hurting them"* (GR). In Germany, the results show an overall heterogeneous picture: here, apps, e.g. one for navigating the wheelchair including further information on the service status, but also other sensors as well as the internet are mentioned as sources: "*I use the internet if I have a specific question and search for products that assist me in care, where do I get support*" (DE). However, there are also participants who report little to no contact: *"I have no experience with DHT, neither work nor private"* (GR).

3. Which digital offers, technologies and information are you aware of?
   - Which of these do you use yourself?
   - [Note to interviewer: give examples again if necessary, see presentation/explanation of research project].

Summary:

Some of the participants have no or only very basic experience: *"I know some very basic things about these domain"* (GR). In the results from Italy, "websites, simple emails and WhatsApp" are still mentioned, which are also used for communication with the doctor. In addition to the use of social media, e.g. for fitness tips for themselves, extensive experiences are also reported in some cases: *"I am using digital technology to inform myself on various issues including health issues, and I know about assisted living tools, sensors, monitors and applications that can provide data on the vital signs of a person. I am using a smartwatch myself"* (GR).

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Perspective II direct target group: development opportunities, chances, obstacles

4. What exactly do you think are the advantages for you personally in using digital health technologies in your everyday work and life?
Summary: The respondents see the following advantages for themselves personally from the use of digital health technologies in their daily work and life: **Save time:** *"For me, digital health technologies will enable me and my husband to save valuable time in terms of commitments (physiotherapies, kinesiology, medication) around my husband's care and also in terms of bureaucratic matters (GR)". "Things can be done faster and more effectively"* (DE) [and you can] "get a doctor's prescription immediately (IT)". **Increased autonomy:** *"you can stay at home longer"* (DE). **Improved communication:** *"One acquires more knowledge and becomes more skilled in talking to medical staff"* (DE). **Better problem solving/information:** *"I can recognise a problem better. For example, if someone says: I feel dizzy. Then I can think about what help I give him so that he is less afraid of the dizziness? What is the trigger for the dizziness? Medication, not drinking enough, etc. So I gain some knowledge and can find a solution more easily"* (DE). *"(...) any system or tool that allows me to have a direct link with my mother's status and health would give me peace of mind and also valuable ongoing control over her health*" (GR). **Possible barriers/approach points** It is pointed out that it would be helpful to provide information about entitlements and funding channels: *"Ah, do I have an entitlement to this item, health insurance often only reimburses certain aids, this information would be very good on one page. Health insurance often only reimburses certain aids, this information"* (DE). In addition, reference is made to balancing processes to be made: *".... of course your privacy is affected and you are monitored, but you have the freedom to stay at home"* (DE).

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5. What conditions would have to be in place for you to use more digital health technologies in your daily work and private life?
The following things were mentioned as prerequisites for integrating even more digital health technologies in private or working life (DE): ▪ *"It has to become cheaper, more affordable [and] easier"* ▪ *"Data protection must be guaranteed, security"* ▪ *"Wifi needs to be installed and should be accessible everywhere".* In addition, the need for proper training was mentioned: *"There is a need for well-structured, progressive training that sets out the framework in which digital health technology will help carers, and analyses how we can use digital health technology on different occasions and in different circumstances, using clear examples and case studies"* (GR). As well as relevant overviews/introductions to digital health technologies: *"There is also a need for us to familiarise ourselves with existing tools and applications"* (GR). But there are also voices from Italy, be it minor ones, that see no need for further development, either because everything is already known "I think that we don't need to improve more digital health technologies because we are doing great at work" (IT) or with the following reasoning: *"It is difficult to use the new technologies, we prefer to use pen and paper"* (IT).

6. In which areas/in which tasks of your overall work and private life could digital health technologies also be helpful?
Summary The answers show a high range and go from *"I just need to use properly my email"* (IT) to *"The technological progress will continue and there will always be new methods"* (IT). The communication aspect is also mentioned: *"In having a better coordination and effectiveness of my care tasks, based on a more frequent or available support network with the health care staff"* (GR). Reminder functions of apps (e.g. to move more, telemedicine, digital health record) are also mentioned.

7. What prevents you from using digital health technologies?
While two people (from Italy) either do not know the answer or answer *"there are no impediments"* (IT) when asked about barriers to use, otherwise the following answers are given:

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Unclear benefits

“I think the technologies are all interesting, but I don't have a specific need, so I don't use them” (DE).

Privacy concerns and **reliability of information**....

... also play a role "*I am not sure about data protection*" (DE) and *"It is difficult to find good information, even on the internet, which site offers reliable information”* (DE).

As well as, *"The fact that older people are not familiar with the DHT discourages me from using the DHT on them”* (IT). In addition, the following were also mentioned - The lack of public awareness about the digital health framework and the lack of education about the use of digital health systems and tools (GR).

Perspective on people over 65

When you think of older people over 65 with whom you have contact…

8. What opportunities and benefits do you see for them in using digital health technologies?
As far as the indirect target group is concerned, i.e. people over 65, the following advantages are seen: **Strengthening social inclusion**: *"There is no doubt that technology helps them to get out of isolation”* (IT) and [a] *"better and more targeted communication with caregivers"* (GR). Furthermore, increased **safety**, e.g. through automated emergency call functions of a smartwatch or also through tracking technology for people with dementia, are mentioned (DE). Increased **individual freedom** and autonomy and self-management are also mentioned: "*They don't need someone caring for them. People with diabetes for example can monitor their blood glucose and respond to deviations*" (DE). The use of recorded information, e.g. via a smartwatch, also enables **better treatment** (DE) as well as better cooperation between those involved in care/treatment (GR). However, it is also pointed out that the extent of the benefit depends on the individual case and the appropriate training of the elderly (IT).

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9. In which areas/tasks could digital health technologies be helpful for people over 65?
Summary: Possible fields of application for DHT are booking appointments with the doctor (IT) and telemedicine (DE), or the possibility to find needed support faster via app. Another point is the control of the home via apps (e.g. light etc.) (DE). *"Knowing that there is constant support available"* (GR), *"and even the monitoring of vital signs"* (GR) [could have the following consequence]: *"To be more confident and autonomous"* (GR).

10. What do you think is necessary to integrate more digital health technologies into the everyday life of people over 65?
When participants are asked what has to happen to make DHT even more relevant to the everyday lives of people over 65, the answers are as follows: **low-threshold offers** ▪ *"Offers, such as the Internet consultation hour or technology café"* (DE) ▪ outreach services: *"Actually going to the people"* **Suitable educational offers** ▪ ***"****Then they need easy, step by step explanation what they are supposed to do (if they want to use tele-medicine for instance)"* (DE) ▪ ***"****In order to search information for themselves they should be able to use google, what key words should I enter and how do I identify a reliable source"* (DE) ▪ *"I think it is necessary to develop a basic training for elderly people in DHL"* (IT). **Successful communication** ▪ *"Unbiased people who give neutral advise"* (DE) ▪ *"Taking away the fear"* (DE) ▪ *"It is also needed a constant update of the development of health technologies, on their new abilities to serve older people"* (IT) **Secured funding** ▪ *"Ensure that the costs, e.g. for a wearable, are regulated and covered by long-term care insurers"* (DE)

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Technological advancement:

- *"Payers and providers should develop a wearable with an app that cannot be manipulated, updates automatically, and makes information accessible to different groups"* (DE).

As far as the individual factors are concerned, it is particularly clear that the focus here is on basic/low-threshold services.

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11. What do you think is the reason why people over 65 might not use digital health technologies?
The following are possible reasons why people over 65 do not use DHT: **Lack of familiarization of older people to digital technologies** ▪ *"Because they have never used these tools. Moreover, we must consider that a 65-year-old person is certainly a little more independent than an older one"* (IT). **Lack of willingness to learn things about new technologies** ▪ *"Some don´t like changes, they prefer things to stay the same"* (DE) ▪ *"I noticed that some elderly people do not appreciate certain type of technologies. I have noticed that some of them still prefer a face-to-face contact with the doctor"* (IT). **Fear of making mistakes** ▪ *"They are afraid to touch anything in the internet, in case they make a mistake"* (DE) Furthermore, the following are cited (GR): ▪ Lack of awareness on the meaning, tools and benefits of digital health literacy ▪ Lack of digital literacy for a big part of people in third age **Physical limitations** In addition, one interviewee expresses *"I don't think there are particular motivations for which the elderly could not use DHT. Some of them might have sensory difficulties"* (IT).

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12. What would help people over 65 to increase their skills in using digital health technologies? What stands in the way?
According to the interviewees, the following things could help people over 65 to improve their ability to use DHT: **Personal accompaniment** ▪ *"That you help them personally"* (DE) ▪ *"Constant and concrete help is essential to learn effectively"* (IT) **Social embedding** ▪ *"And when you work together, laugh together, that's how we did it in the course and it worked really well"* (DE) ▪ *" (…) apply it [information from applications and tools] in collaboration with the caregiver or the health staff"* (GR) **Didactic approach** ▪ *"Not just showing them how to do it, but really working with them that they have to do it themselves"* (DE) ▪ *"The use of practical examples"* (GR) **Technical framework** ▪ *"Large, large fonts for people who no longer see well"* (DE) ▪ *"And good audio so also for listening"* (DE) ▪ *"Apps in this area are definitely more suitable for a tablet than for a smartphone then"* (DE) ▪ *"Well structured and user-friendly applications and tools so for older people to be able to read the information and apply it (…)"* (GR)

Training/level of didactic knowledge

Imagine training people over 65 in the use of digital health technologies…

13. What general conditions would be needed for you to succeed in this?
The following things are mentioned by the direct target group of carers that would be necessary for them to successfully train people over 65 in the use of DHT: **Personal preparation/pre-requisite of the trainer:** ▪ *"I need to go through the steps myself first, when I know the scenario (…of online consultation, tele-medicine) I can explain it better"* (DE) ▪ *"Good knowledge upon the application of digital health technologies"* (GR)

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Prerequisite for people over 65

- *"The availability and disposability of the older person. Many times it is difficult for an older person that lives with the burden of a chronic disease to find the time and the right mood to follow such lessons"* (GR)
- *"pre-condition is that the person knows how to handle a smartphone or has some basic skill regarding technology"* (DE)
- *"Or you have to divide between beginner and more advanced. So people without any knowledge can start with the basics about tablets, smartphones and also apps and then later you can specify on healthcare apps"* (DE)

Didactics/methodology

- *"Take time for each persons questions and let them try out for themselves"* (DE)
- *"You have to fit into the generation, always look at each person individually, adjust to their needs and competences then it will be successful"* (DE)
- *"Bring the technology closer, inform, explain, show personal advantages, benefits best associated with already known examples (emergency call button), establish trust, give security"* (DE)
- *"A very simple written guide and a mentor teaching me are important"* (IT)
- *"Mutual understanding and trust between the Caregiver and the Elderly person"* (IT)
- "refresher courses" (IT)
- *"An idea could be to work with rewards (…small medals and also other gifts)*" (DE)
- *"I think in person meetings are better especially in the beginning so the participants can have some exchange. Zoom-Meetings could be the 2nd or 3rd step when they have some experience"* (DE)

Technology/social environment

- *"And the important thing for me is, that everyone really uses it [DHT]. Regarding the E-file or wristband all healthcare services should use it, so that the data is bundled there"* (DE)

- *"Small groups max. 5 persons; short interventions max 30 minutes"* (DE)

Together, the above results show that it is not "just a matter of putting an e-learning platform online". Instead, there needs to be appropriate involvement, selection and preparation of both mentors and people over 65.

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14. What skills and methods would you like to learn or develop in order to train people over 65 in the use of digital health technologies?
The mentors would like to further develop the following skills and methods in order to optimally support people over 65: **Communication/interaction with the target group** ▪ *"Communication is an important aspect, how do I talk to them*?" (DE) ▪ *"Someone who explains me how to teach in a simple and clear way"* (IT) ▪ *"How to talk with them, look at them, trying to have eye contact, to speak loud, clear, slow"* (DE) ▪ *"You need patience with older people"* (DE) ▪ *"To be able to use simple, easy to use, applicable training material"* (GR) In addition to these aspects, the need *"to learn well the function of the platform, to learn well the current issues on DHL"* (GR), as well as *"acquiring experience with DHT and knowledge about the recent developments"* (IT) were also mentioned. Furthermore, participants also mention the need to develop *"better digital literacy skills"* (GR) themselves or do not see themselves in a position to take on the tasks of a mentor at all: *"I do not think I am capable of doing this"* (GR). Reference was also made to English as a technical language in the field of DHT: *"English language skills can be useful to find more content in google or to find it easier/faster"* (DE)

15. What exactly would training to become a mentor for digital health technologies look like that would make you want to participate in it? a. In general, do you remember a training you attended that was particularly great? b. If yes, what did it look like? c. Can you describe what impressed you there?
Summary: In the view of the interview partners, a successful online training for mentors would be designed as follows: **Structure and content** ▪ *"Small units"* (DE) ▪ *"Preferably during the day, during working hours"* (DE) ▪ Good practice: *"Sometimes we had to listen, then we had to work on our own, then we were able to ask questions"* (DE) ▪ *"Have a clear learning structure and learning objectives"* (GR) ▪ *"acquire a better knowledge about DHT and to practice"* (IT)

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- *"Expert or specialist knowledge must definitely be present, must be in there"* (DE).
- *"A course for learning how to deal with people, so how to deal with really all kinds of patients and residents, because there are various"* (DE)
- *"Maybe you can also show people how to google properly, that you have to search further down, that you have to look in forums"* (DE)
- *"The language has to be comprehensible"* (IT)
- *"ability to transfer the knowledge acquired"* (IT)

Place/type of presentation

- *"Partly via Zoom invitations, then of course send them to different homes, also for the older generation. But also for people who want to talk to people, on the spot or don't have the technical possibilities, like a camera (…)"* (DE)
- *"would try both ways in person and digital, so maybe trying hybrid"* (DE=
- *"face-to-face course"* (IT)
- *"the more personal someone makes a lecture or a training session, the more pleasant it is for me"* (DE)
- *"(…) someone who is very enthusiastic helps as well"* (DE)
- *"Have a constant support available"* (GR)
- *"The training course should be simple and clear, so you can learn step by step"* (IT)
- *"And explain that other people also have the same problem as you have, so they do not feel alone"* (DE)

16. The DigiHall-project will develop an e-learning platform. Do you already have experience with this kind of learning environment? If yes, please describe your experience.

    a. Do you remember an e-learning training you attended that was particularly great?
    b. If yes, what did it look like?
    c. Can you describe what impressed you there?

With regard to an e-learning platform, the participants have already had the following experiences:

- *"(…) what I liked most was the opportunity I had to study when I was available, and the direct connection I had with the supervisor and the other learners"* (GR)
- *"(…) What I liked most was the variety of the applications of the training material which make the learning much enjoyable and more experiential"* (GR)
- *"(…) At the beginning I had to be educated and get accustomed to the learning platform (MOOC)"* (GR)

Structure and content

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- *"A nice design, nice colours, a good structure"* (DE)
- *"No advertisement, a certain professionalism in programming"* (DE)
- *"I also like a nice design in a way, that also entices you to open the app. A simple operation. And e.g. also important is a password storage at the beginning. Not that every time you log in, you have to enter a lot every time you log in to the app. Then people don't feel like it, because I don't either. And then I don't open that app anymore"* (DE)
- *"I like animations and small games, working with rewards in one app you received a flower and if you answered correct the plant"* (DE)

Place/type of presentation

- *"A face-to-face course is more detailed, in my opinion. But, if there were not the conditions for a face-to-face course, it would be ok an online one"* (IT).
- *"Online, it really needs a topic where I absolutely want to learn about it"* (DE)
- *"In my case I also have participated in some distant learning courses, and I prefer them in comparison to face learning sessions"* (GR)

Social embedding

- *"I remember with pleasure some face-to-face meetings: I liked the interaction between the participants and the possibility to express yourself"* (IT).

Technology

- *"It might be helpful to secure the tablet, to change the seetings in such a way that they are not able to do everything, in order to give more security"* (DE)

Review

17. Looking back on the course of our conversation, is there anything else you think we should know or consider with regard to this goal?

Selection of mentors and didactics

- *"You need open people; you need to make sure that they are people who speak clearly, loudly and kindly enough to people"* (DE)
- *"You should definitely consider the particular abilities and learning needs of the people who will be participating in the training"* (GR)

Social embedding

- *"Organize meetings for the mentors so they can have an exchange"* (DE)
- *"Address the relatives more actively and offer more information, provide more knowledge"* (DE)

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Content

- *"And my idea would also be, with regard to all these aids, that there is also a clear examination by experts and that you have digital pages where it is precisely listed: There is this, this and this"* (DE)

Type of presentation

- *"a video helps because it also ultimately bypasses language barriers. You can also watch it several times and not only once, I can lay the tablet or smartphone next to me and watch the video to follow the explanation"* (DE)
- *"Variety is always good, the less text the better. I hate reading texts, so I personally am rather visual and audio"* (DE)
- *"Reflect everyday life, in videos show not only young, slim, athletic people"* (DE)

18. Additional question for evaluation (was not included in the interview guide): Did you, as the evaluator of the interviews, have any other findings from the interviews that have not been mentioned so far and that are important/ relevant for the further implementation of the project?
Results: Empty for Greece, Italy and Germany

4.4.2 Indirect target group (people in third age)

Perspective I indirect target group: status/experience

1. Describe if and where you have gained professional or private experience with digital health technologies.
Summary: The first question was about the amount of experience people in third age have gained with digital health technologies in a private or professional context. Most of the interview partners from Germany, Italy and Greece didn't have extensive knowledge or experience with digital health technologies. Some common applications or technologies like mobile phones, sometimes even smartphones and computers are known, but not their exact capacity. For the most part, respondents were already retired when technology was introduced into their daily work lives. In some cases, the level of experience is very heterogenous. One of the interview partners showed more advanced experience: *"I do everything by myself; no one taught me how to use them. They (he/she refers to doctors, etc.) indicated me to use these technologies in order to download the blood tests. They told me: 'you have to do in this way, there is a code, a password, and you can download them'. It occurred the same situation with the electrocardiogram. I book the medicaments, but I learnt everything by myself" (IT).*

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Another partner, on the other hand, showed no experience at all and told us that:

“Only newspapers!“(DE).

Where the type of media that would be used.

2. Which digital offers, technologies and information are you aware of?
   - Which of these do you use yourself?
   - How often do you use those things?
   - What is the main motivation/goal you want to achieve by using digital health technologies?
   - Do you/did you use information to make concrete decisions about your own health behaviour? If yes, what was the decision/behavior?

Are you interested in specific topics or technologies?

Summary:

The main focus in usage of digital technology is in gathering health related information. It hasn’t been used by the respondents a lot for maintaining health so far. Mostly health information has been gathered on the internet via a computer or mobile phone.

“I often use the mobile phone to look up diseases or to contact the doctor. I use the mobile phone especially. I use it every day. I would like to seek medical information and to keep my health under control. I used this type of information, but I always consulted the doctor before making decisions on information found on the Internet. I am not particularly interested in specific technologies or topics. I feel good with the mobile phone” (IT).

Specific digital health technologies aren´t that known. Some respondents know smartwatches or the possibility to get an e-prescription, but don´t have a lot of experiences. Just in one interview a respondent used an app to get ready for a surgery. It was prescribed by a doctor and seemed to be helpful at the moment (DE).

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Perspective II indirect target group: development opportunities, chances, obstacles

3. What exactly do you think are the advantages for you personally in using digital health technologies in your everyday work and life?
Summary: Although respondents do see a lot of opportunities in the usage of digital health technologies the answers go from *"none"* (DE) to *"using digital health technologies in my everyday work and life improves my general health condition and I can take under control all the visits I booked"* (IT). The main response is that digital health technologies is helpful in terms to know more about the own health and health issues. The fact to be informed and to know what to do has been seen as the main chance and opportunity. *"We can have more information regarding the course of our health, and we can arrange better our daily living in relation with the doctor's guidelines. We anticipate a feeling of a more concrete management of our health based on the use of digital technology tools and applications in the future"* (GR).

4. In which areas/in which tasks of your life could digital health technologies also be helpful?
Summary: Most answers were about communication with medical staff or information gathering. But also to track the own fitness (DE). Also in terms of communication with the doctor. *"In our daily living regarding the continuously updated knowledge of what we can or we are allowed to do"* (GR).

5. What conditions would have to be in place for you to use more digital health technologies in your daily life?
Summary: On the one hand: *"I do not think there are particular situations. Now I am old and I do not think I will use them better than now"* (IT). On the other hand, most rated conditions were:

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- It has to be easy to use.
- There must be somebody who is there to show how it works.
- The tools have to match the individual needs.

The price shouldn´t be too high.

6. What prevents you from using digital health technologies?
Summary: Digital texts are often small and hard to read or too complicated for elderly people. Also, there is fear of data leaks or fraud. *"I am thinking about the possibility of mistakes by the technology that can prove to be crucial for my health"* (GR). *"The vocabulary used may prevent me from using digital health technologies because English is used for everything (also in health terminology). I must know this new vocabulary, which is neither English, because it is often Italianized"* (IT).

Perspective: Learning

7. What was your first approach towards the usage of digital technologies concerning your health?
Summary: Most given answer is the approach caused by a medical issue, a surgery or other health problems. *"In the past, I was really sick and I had to approach digital health technologies"* (IT).

8. What would help you and people over 65 in general to increase their skills in using digital health technologies? a. What skills would you like to improve? b. What stands in the way?
Summary:

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Some do not need it at all. Others would like quick-courses and more practice in their everyday life.

I think some quick-courses could help. I would like to find Italian terms, because English is used for everything. It is important that the language is comprehensible also for the elderly. I often need to look words up in a dictionary. For me, it might be an obstacle the fact that I do not know this kind of vocabulary, which many times consists of English/Italianized terms" (IT).

9. Which device do you prefer to use (tablet, mobile, desktop pc)?
Summary: Most given answer is the mobile phone or the computer because it is easier to use. *"I prefer the PC, because it is large (for the screen's and keys' dimension). It is easy to bring the tablet with me (I bring with me also the notebook, I put it in a bag"* (IT). Some also use a smartphone or wearables.

10. What is important to you with regard to the handling of your technological devices?
Summary: It has to be easy to use and there must be somebody who is there to show how it works. The tools have to match the individual needs and it should be affordable

Perspective: Training/level of didactic knowledge

Imagine a mentor will teach you and others over 65 in the use of digital health technologies…

11. What general conditions would be needed to succeed in this?
Summary: The training needs to be in person – and the person who is teaching needs to be patient and spe an understandable way. *"He/she should always be available to come to my home in order to give me the explanations"* (IT).

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12. How can a mentor support you in using digital health technologies?
Summary: The mentor should be patient and teach the way of using digital health technology step by step. The responds weren´t very specific from each country. Interview partners from Greece did not give any answer.

13. What skills and methods do you think are necessary in order to train you and other people over 65 in the use of digital health technologies?
Summary: A lot of respondents did not give an answer to this question. Patience, a simple language and teaching in small groups were considered as helpful.

Review

14. Looking back on the course of our conversation, is there anything else you think we should know or consider with regard to this goal?
Summary: One idea mentioned was: *“There could be a test in which you can prove your ability to use digital technology and also see what you are missing”* (DE).

15. Additional question for evaluation (was not included in the interview guide): Did you, as the evaluator of the interviews, have any other findings from the interviews that have not been mentioned so far and that are important/ relevant for the further implementation of the project?
Summary: The setting of the different people seems to be very important: how much help do they have in their everyday life, do they live at home and how good is the internet connection, how close are they with their children etc. It seems like the setting is quite important weather they are using digital technology or not.

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4.4.3 DHL-Experts

Status/experience

1. Describe in what way you have contact with people over 65 in your professional or private everyday life, e.g. also in an honorary capacity.
Summary: It depends on the professional context: Many have contact with their relatives. Parents and grandparents. Others work with the elderly for social services. Summarized, it is private or professional contact. *"I work in an organization for older people with MCI or dementia, and I also am doing consulting sessions with care givers of older people"* (GR).

2. Describe where you have gained professional or private experience with digital health technologies.
Summary: The usual technologies like the internet, smartphones, wearables etc. are used for health matters. In a professional context the respondents have a lot of experience with very specific digital health technologies like telemedicine, communication tools in a medical field, European research projects or contribution to the training of health ambassadors. *"I have been interested in telemedicine for years. I started with a Teleconsultation project, a diagnostic support for hospitals outside the Marche region"* (IT).

3. From experience in the past and present: What are the main topics/developments regarding digital health technologies and people over 65?
Summary: Improving the ability of the own health and illness management and monitoring via apps, telemedicine, data management and digital social participation. "*Social participation as a very important aspect for older people (there are more and more older people who live alone), this also includes digital sovereignty, some social discussions only take place via social media"* (DE). Especially elderly people benefit from digital health technologies because it allows them to get information or help without deplacement. "*People over the age of 65 are largely not familiar with digital health technologies and consider only a visit to the specialist to be acceptable. In order for this to change it is needed an awareness and information campaign based on customized training and*

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education material that can persuade and motivate older people, offering them tangible benefits and solutions to their health problems" (GR).

Perspective on people over 65

When you think of older people over 65 with whom you have contact…

4. What opportunities and benefits do you see for them in using digital health technologies?
Summary: Access to information, help and medical advice from home. Daily health or illness monitoring and tracking of symptoms – the data is sent to a doctor, which can be a huge benefit for elderly people when it comes to managing symptoms, medication and illness alone at home. **"***Avoidance of treatment errors/polypharmacy through shared access to a document or cloud by the treating physicians. Reduction of hospital admissions. Possibility to influence one's own health more (and to get more responsibility in one's own hands). Lower entry threshold, e.g. to take part in a health course, if this can also be done digitally from home. Lower waiting times/reduced travel times if, for example, video consultation is used. Use of health data to preventively recognise possible questionable developments"* (DE).

5. In which areas/tasks could digital health technologies be helpful for people over 65?
Summary: The main focus would be on home assistance and health monitoring, as previously mentioned. Therefor telehealth, telemonitoring, teleassistance is needed. But also providing elderly people with information, participation options and guidance. *"Digital Health Technologies could be used for people with chronic diseases, frailty, and for people with neurocognitive disorders (e.g. Alzheimer's) specifically through mental empowerment applications in order to reduce the progression of the disease and maintain functionality. Also, through the application of sensors, that can monitor the daily course of the person's health in order to prevent further deterioration"* (GR).

6. What do you think is necessary to integrate more digital health technologies into the everyday life of people over 65?
Summary: First of all: knowledge. Elderly people need to know how to use digital health

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technologies. Part of it would be:

- *How do I use these offers?*
- *How can I order them online?*
- *Where can I find providers?*
- *Where can I perhaps try this out?*
- *For services, the question would be via which platform, which app do I need to download?*

(DE).

And:

"*Simplifying the instructions and how to use them in order to familiarize older people with them. Informing people about the use of technologies by health professionals (e.g. Personal Doctors) who can help to increase the elderly's confidence in the use of similar technological applications"* (GR).

7. What do you think is the reason why people over 65 might not use digital health technologies?
Summary: All interview partners agreed on the fact that one of the biggest problems is the lack of knowledge. Digital health technologies often are too complicated, not known enough or the importance / benefit of their usage is not clear. *"Too complicated (if you buy a smartphone today, the first thing you have to do is create an account and have an email address = insurmountable hurdle for some)"* (DE).

8. What would help people over 65 to increase their skills in using digital health technologies? What stands in the way?
Summary: The following sentence / respond summarized well the concept of lifelong learning: *"After the first approach to DHL, the over-65 needs daily practice in the use of new technologies because they lack of constancy in applying new technologies"* (IT). On the one hand it is important to actively seeking out the target group and to provide a long-term support in the use of these technologies. On the other hand a permanent contact person to help with problems and questions is needed and instructional videos can be helpful.

Perspective direct target group/future mentors: development opportunities, chances, obstacles

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Imagine training people over 65 in the use of digital health technologies…

9. What is your perception regarding the current status of digital health literacy of informal, low trained caregivers or volunteers?
Summary: It depends on their age and usage of digital health technologies in everyday life. "*There is a high knowledge of basic technologies among young, low trained caregivers. In the under-50 age group, knowledge is almost 100% but, unfortunately, above this age it drops by half"* (IT). Digital health literacy does not only mean to know how to use digital devices but also which information is serious and which is not.

10. How can informal, low trained caregivers and volunteers strengthen older adults to adopt new technologies?
Summary: Trough courses: A small group size has been mentioned as an important component. Also lessons, which aren't too long, with a lot of repetition instead. The introduction should be very practical and in a simple language. *"Through training, being aware of the benefits of new technologies, and of modern tendencies. Also, the practical application of technologies by health professionals (doctors, nurses, social workers, etc.) in the homes of the elderly in the presence of caregivers would help to better understand their use and would give additional motivation for their application on a daily basis"* (GR). One respond was that digital health technologies need to be more adapted to elderly people first – or at least, apps especially for elderly people should be used in the trainings.

11. What do you think are the advantages of educating mentors to support people over 65 in the usage of digital health technologies in their everyday life
Summary: It is very important that "a real person" teaches elderly people because the direct contact would be the easiest and most comfortable way for elderly people to learn. For people in third age the benefits of using digital health technology correctly are the general improvements in quality of life and health. "*The training of informal caregivers to act as mentors on the use of DHT has a clear advantage for them since it enables people who have the daily role of caring for the elderly to familiarize themselves with the use of these technologies, understand their*

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positive effect and then motivate more efficiently in this direction the people they care for" (GR).

Training/level of didactic knowledge

Imagine a training designed for people over 65 in the use of digital health technologies…

12. What general conditions would be needed to succeed in this?
Summary: A small group size has been mentioned as an important component. Also, lessons, which aren't too long, with a lot of repetition instead. The introduction should be very practical and in a simple language. An easy access and data security. "*Presentations with small text and legible letters (easy reading) using photos and videos to understand the material. Practical application of technologies for better understanding of knowledge and familiarity with applications"* (GR).

13. What skills and methods are needed in order to train people over 65 in the use of digital health technologies?
Summary: A mentor should be enthusiastic, patient and committed. He or she should be able to work well with seniors and have knowledge regarding digital health technology. Such as media education skills, basic digital competence, but no programming skills. Videos and working with pictures can be helpful. *"The training should be done by people who have a clear knowledge of the special issues that people over 65 face, and of how they should be introduced to them for learning new skills and applying them in daily practice"* (GR).

14. What should we consider in online training (via an e-learning platform) educating mentors for digital health technologies for people over 65? ○ In general, do you remember a training you attended/designed that was particularly great? ○ If yes, what did it look like? ○ Can you describe what impressed you there?
Summary: Teaching materials available online, a section of the platform where caregivers can

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contact a DHL expert in case of need and online tutorials that can be repeated.

"*In these trainings the main characteristic was the simplified manner of analysis of the function, as well as the connection of the application's function with the needs and requirements of the care receivers"* (GR).

Other projects/further comments

15. Do you know other projects connected to DHL?
    - What should we be aware of?
    - How can we compliment to these projects?

Summary:

In all three countries similar projects are known, which concern digital health technologies or literacy regarding seniors / elderly people. Also a few training programs for nurses and volunteers are known.

"*Kompetenzzentrum digitales Lernen*" (DE)

"*AMMA Association Molisana Alzheimer's Patients- training for caregivers who have to deal with Alzheimer's patients*" (IT).

"TECH CARE Erasmus plus project, is a project that in essence tried to map the path towards the Digital literacy for informal caregivers and older people in need of care" (GR).

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Review

16. Looking back on the course of our conversation, is there anything else you think we should know or consider with regard to this goal?
Summary: "*Do not lose sight of the fact that people really often start where you turn a device on and off"* (DE). The whole subject needs to be presented and taught positively. Elderly people need to see it as an advantage to learn about digital health technologies. Also the courses need to be customized to their target group – depending on the skills, they already have.

17. Additional question for evaluation (was not included in the interview guide): Did you, as the evaluator of the interviews, have any other findings from the interviews that have not been mentioned so far and that are important/ relevant for the further implementation of the project?
Summary: Applications to increase social participation. Mental health needs to be focused on too. The components sustainability and legal and ethical aspects need to be looked after too. *"Train the trainer was also recommended. Does this mean for us that, under the keyword "sustainability", each country must consider for itself how it can ensure that the learning platform is actually used and that seniors are really supported through it*" (DE).

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5 Case studies

The results of the previous tasks, especially the interviews, formed the base for the following case studies.

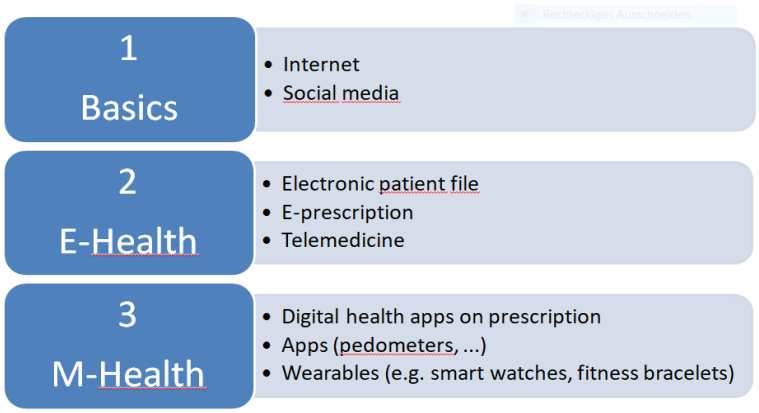
Compilation of persona and interactions (case studies)

The aim of the DigiHall project is to develop a simply innovative and easily accessible e-learning platform and mobile application. The chosen approach combines the requirements that the offer should be low-threshold on the one hand, but on the other hand still innovative and clearly focused on the issue of digital health literacy (not "only" digital literacy). This leads to the following conclusions, also for the platform: it is not suitable for people who already lack basic digital competence ("how do I use a tablet, how do I even get an internet connection?"). For these, we will provide links to other reliable websites or projects that offer these trainings as well as an invitation to visit our learning platform again afterwards. For those who already have an expert level in digital health literacy, they are also not the target group of our offers. This is also reflected in the following case studies.

The case studies developed represent a condensation of the results of the interviews conducted. With the help of the following matrix, the different functional dyads (care receiver - caregiver) and their different manifestations in the relevant characteristics were analysed/compiled.

		Persona Caregiver				
		Didactic skills	**Digital literacy**	**DHL - basics (internet & Social Media)**	**DHL - E- Health**	**DHL - Mobile Health**
Persona 3rd age	**Motivation**	low, medium, high	low, medium, high	low, medium, high	low, medium, high	low, medium, high
	Digital literacy	low, medium, high	low, medium, high	low, medium, high	low, medium, high	low, medium, high
	DHL - basics	low, medium, high	low, medium, high	low, medium, high	low, medium, high	low, medium, high
	DHL - E- Health	low, medium, high	low, medium, high	low, medium, high	low, medium, high	low, medium, high
	DHL - Mobile Health	low, medium, high	low, medium, high	low, medium, high	low, medium, high	low, medium, high

The following categorisation of Digital Health Literacy was applied:



The aim was to identify possible scenarios illustrating the main challenges, that can should be addressed throughout the project. These case studies show the needs and attitude of a person in third age and or caregiver regarding digital health literacy.

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Case 1: Communication is everything - limited time & lost in (the) world wide web – INFORMAL CAREGIVER / CARING RELATIVE

Care receiver:

- Age: 76 / 78
- Gender: female / male
- Relevant medical history/conditions: Mrs Tasia has arthritis and hypertension, Mr. Panagiotis has arrythmia and hypertension

Caregiver:

- Age: 47
- Gender: female
- Relevant medical history/conditions: -
- Relevant characteristics: basic DHL (Internet) | intermediate digital skills | caring relative

Current life style, routines and care arrangements:
Olympia is 52 years old and is taking care of her parents Mrs. Tasia and Mr. Panagiotis 76 and 78 years old respectively. Both her parents face health problems, her mother has arthritis and hypertension, while her father has arrhythmia and hypertension. Olympia works at the Patras municipality. She is married and a mother of two girls 14 and 16 years old.

Despite the many hours she needs to work and be with her family, Olympia is able to visit her parents 4-5 days per week, and so she has a very good overall control of her parent's problems and health status. She has several times raised the issue of hiring a caregiver to spend at least some hours per day taking care of both her parents and mostly her father, as her mother is beginning to have less physical strength to service Mr. Panagiotis. Nevertheless, Mr. Panagiotis is absolutely negative of having a caregiver; he thinks that they can manage their life just fine.

Regarding the different health related obligations and tasks; Olympia many times is overloaded as she has to drive her parents to the different medical appointments, and also to take care of their medicine lists. As she has a lot of obligations and her time is limited, it would be very important to her if she could save time, especially with bureaucratic matters (making doctor's appointments, collecting prescriptions...). Olympia is adequately digitally literate as apart from her smartphone she uses pc in her job and because she works in the social prone sector of the municipality, she had the chance to hear some basic things about digital health literacy and the benefits it might bring. During the pandemic she had the chance to easily arrange the appointments for the vaccination of her parents, and this was her first very helpful acquaintance with a DHT application.

As far as caring for and supporting her parents is concerned, she sometimes searches for relevant information about the medical conditions on the internet. However, the large amount of pages on the subject overwhelms her, as does the difficulty in assessing which of the sometimes contradictory information she can trust. At the same time, however, such information would help her to be more articulate in her dealings with medical staff.

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Olympia's needs for intervention:

1. Save valuable time regarding obligations (Arranging medications, contact to doctor…): E-prescription/Telemedicine
2. Data/Critical literacy: implement effective search strategies, identify reliable source
3. Direct and targeted communication with medical staff

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Case study 2: Low motivation meets low didactic skills – VOLUNTEER

Care receiver:

- Age: 76 / 78
- Gender: female
- Relevant medical history/conditions: Diabetes, chronic obstructive pulmonary disease
- Relevant characteristics: Low motivation to learn about DHL | basic digital skills

Caregiver:

- Age: 63
- Gender: male
- Relevant medical history/conditions: -
- Relevant characteristics: basic DHL (Internet) | high digital skills |low didactical skills | volunteer

Current life style, routines and care arrangements:

Mr Hofmann worked as an IT specialist in his professional life. His recent retirement gives him the freedom to do the things he wants to do. In the process, he felt the desire to support older people in benefiting from the possibilities of digitalisation. As part of his voluntary work, he now advises senior citizens on relevant issues.

Mrs Wagner, among others, also uses this option. With the help of Mr Hoffmann, she has already installed her internet at home. She uses her mobile phone mainly to communicate with her distant family via Whats App. Due to her age, she is severely limited in her ability to move around; she usually uses her rollator, but recently she has started to use her electric wheelchair more. She also has a diabetic disease and, as a long-time smoker, chronic obstructive pulmonary disease. Especially because of the latter, she belongs to the corona risk group, which is why she worries about long contacts in closed rooms (such as in her doctor's waiting room). In the course of her recurring contacts, Mr Hofmann had the idea that Ms Wagner could also ideally benefit from the possibilities of digital health technologies. He therefore advised her to make more use of telemedicine or mobile applications, such as the digital measurement of blood sugar.

However, Mrs Wagner regularly counters his advice with objections such as "I'm too old for that" or "I've managed like this so far". Since Mr Hofmann is convinced that the use of DHT would greatly improve Ms Wagner's quality of life and autonomy, but at the same time he senses her resistance, he is increasingly frustrated and reacts with growing irritation at the joint meetings.

Mr Hofmann´s needs

1. Better understand how to communicate the opportunities of digital offers around the topic in a better and age-appropriate way.
2. Reflect appropriately on one's own attitude

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Case study 3: the nurse as scientist/manager (empirically based care) – (LOW TRAINED) CAREGIVER

Care receiver:

- Age: 75
- Gender: male
- Relevant medical history/conditions: stroke incident, high blood pressure, thrombosis
- Relevant characteristics: no experience with DHT | basic digital skills | intermediate motivation to learn new things

Caregiver:

- Age: 36
- Gender: female
- Relevant medical history/conditions: -
- Relevant characteristics: advanced DHL (Internet, Social Media, E-health [telemedicine, electronic patient file, e-prescription] | high digital skills |low didactical skills | low-trained caregiver

Current life style, routines and care arrangements:

Konstantina 36, she is household assistant who visits for three times per week Mr. Nikos (75 years old), who about a year ago had a stroke incident he managed to overcome without any significant repercussions.

Mr Nikos has a son who is married and lives in Athens 250 km away from Patras where is the residence of Mr. Nikos. His wife passed away 1,5 years ago. About half a year later Mr. Nikos who was living alone had a very worrying incident of falling down and loosing contact with the environment for a few hours. During that time he lost his self-awareness, he couldn't utter normally his words and was addressing meaningful proposals. All the meticulous medical examinations including MRI and triplex showed nothing. Doctors assumed a mild stroke incident and instructed him to leave his work so to avoid the tense situations and they also prescribed him a complex medication to balance high blood pressure and antithrombotic treatment.

Konstantina has assumed most of the health monitoring of Mr. Nikos, with the help of his brother who usually is the one driving him to the medical and doctor appointments. She has high digital literacy competences; she uses her smartphone and the computer in her work, where she can report her visits and all details for each case she takes care of. She knows well about application of search strategies to find valuable information in the internet. She is also already familiar with the advantages/handling of e-prescription and telemedicine. Even if she has already heard about it, she does not yet have that much experience with the possibilities and fields of application of mobile applications.

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Konstantina sees the need for Mr. Nikos and herself, especially as years pass, to have a more constant surveillance. Her goal is to better understand the physical condition of the person she´s taking care of. That's why she always keeps her eyes open for systems/tools that give her reassurance via direct connection with her clients' status and health condition. She wants to have valuable information as a warning (prevention), and to identify problems better (for example connections between medication and dizziness)

Mr. Niko has no experience with DHT so far. He uses every day the smartphone for sending/receiving messages and for calling relatives. Moreover, he uses the Internet only to search for medical information. He also thinks that he could have advantages in using technologies related to medical aspects (for example, it is possible to book a visit, reserve some prescriptions at the pharmacy, etc.). In general, he is interested in learning more about DHT, but he thinks that the technologies must be easy to use/access in order to understand them. Also, a very important point is to have someone who can explain how to use DHT (because he is afraid of making mistakes and because he knows little about DHT).

Konstantina's needs:

1. Constant monitoring for avoidance of risky and life-threatening situations
2. Monitoring of vital signs in different activities
3. Learn more about mobile health applications
4. More didactical skills to train/help Mr. Nikos

Mr. Niko´s needs:

1. Get an overview of digital health technologies
2. To have someone who can explain how to use DHT

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Case study 4: taking care of yourself/autonomy is everything – THIRD AGE

Care receiver:

- Age: 65
- Gender: male
- Relevant medical history/conditions: stroke incident, high blood pressure, thrombosis
- Relevant characteristics: some experience with DHT | basic digital skills | high motivation to learn new things

Caregiver:

- Age: 40
- Gender: female
- Relevant medical history/conditions: -
- Relevant characteristics: advanced DHL (Internet, Social Media, E-health [telemedicine, electronic patient file, e-prescription] | high digital skills |low didactical skills | relative

Current life style, routines and care arrangements:

Mr. Lombardi has already some experience with DHT. He uses every day the smartphone and the PC (but more often the PC because it is easier to read texts on the big screen) for searching information on medical treatments and health information. If he needs further help, his daughter, Mrs. Rizzo, usually supports him. As she has recently changed her job, her time has recently become very limited. For this reason, and because autonomy has always been very important to Mr Lombardi, he decides that he would like to take the subject of health and the corresponding digital possibilities more into his own hands. He hopes to improve both his quality of life and that of his supportive daughter, and also to discuss his health issues more collaboratively with medical staff.

He also thinks that it could be useful to have a mentor who explains the importance of DHT. This mentor should be very patient and should come to his home to explain those things. He also wants to practice in order to understand better DHT. In general, he is interested in DHT, but afraid of being frauded and/ or of not understanding something which is important.

Mr. Lombardi´s needs:

1. get an overview of digital health technologies
2. to have someone who can explain how to use DHT
3. being able to adequately assess possible dangers of using digital health services and prevent corresponding risks.

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6 Guidelines for DigiHall

6.1 Conclusions and guidelines from literature review

As digital health literacy is a huge opportunity, both to develop efficient welfare skills and to receive reliable information. It's a first step to seek help in territory and to find a concrete support for informal caregivers that have the possibility to relieve loneliness and create interesting solutions even outside the domestic context. Informal caregivers should be supported in their choices and involved during the implementation and also during the device design to have an effective awareness of the instrument that they will use to assist (e.g. elderly people).

The use of technological tools is now fundamental for the user because, in the social and relational context, they promote the maintenance of his well-being. An acceptable level of digital literacy is now indispensable for caregivers, be they formal or informal. Allowing the patient to make the most of all the services offered in the national healthcare panorama cannot ignore a concrete digital competence on the part of the caregiver. An example: the request for transport by ambulance that is made by e-mail or the use of the SPID (in Italy) which has become fundamental for the whole society today.

So, taking the literature review into account the Digihall project and especially the e-training needs to consider specific barriers and facilitators that influence the use of e-health by older adults. This is critical to improve their use of e-health programs, and to realise the potential of technology to ameliorate the challenges associated with traditional healthcare for this group. Findings from relevant reviews suggest that older adults are more likely to use e-health services that are cognizant of their physical and functional needs, provide appropriate education and training to engage with e-health, address previous negative experiences of, and misconceptions about, digital health technologies; and employ strategies to enhance the perceived trustworthiness and credibility of e-health.

Intrinsic barriers mainly include physical, sensory, intellectual ability, and motivation. Physical ageing is the most prevalent barrier to accessing e-health, with hearing and sight limitations being the most common. Concerns also refer to memory particularly with remembering passwords, and the acquisition of new information. Additionally, the reduction of fine motor control (i.e., trembling hands) makes it difficult to interact with devices, particularly those with small screens. Perceived self-efficacy regarding the use of technology focuses on:

- the difficulties of using technology and e-health;
- concerns about the use of digital mental health technologies; and
- feelings of incompetence

Additionally, some other internal barriers exist, such as computer anxiety, lack of self-esteem, lack of self-efficacy, lack of personal motivation, lack of computer interest and efficacy, and attitudes towards the aging experience regarding psychosocial loss and psychological growth, poor acceptance and compliance, reliance on health professionals for information, emotional barriers (shock, fear, anxiety), and avoidance of information.

People in this age group tend to experience more stress and anxiety regarding the learning process than the younger generation. Physical barriers, such as vision or hearing problems,

were identified as other challenges faced by elderly people. Moreover, a low level of education among the geriatric population represents another important limitation in their efforts to deal with e-health, m-health, or other digital health services.

Intrinsic facilitators highlight a willingness and desire to learn, finding that participants who articulated an innate sense of curiosity and interest in technology were more willing to use e-health, and more likely to engage and explore various e-health platforms. Other facilitators were a motivation and desire to make a lifestyle change and a desire to contribute to scientific progress by trialling e-health programs in the context of research.

Extrinsic barriers (external factors outside the individual) include:

- Inexperience with e-health or with computers/technology in general and an overall lack of awareness of e-health opportunities
- previous negative experiences or unmet expectations in relation to e-health services; a preference for traditional health care services; or a genuine fear that, if unused, traditional health services may cease to exist
- stigma around e-health services may be extended to a disbelief in the reported advantages of technology, lack of confidence in the use of technology as a health service, and a belief that telephones (smart phones) are for telephone communication only and not for health services
- perceived lack of routine and structure (external accountability) provided by e-health services may create a barrier to incorporate e-health into daily routines, and a perception that learning to engage with e-health involves more effort than reward
- cultural barriers, including second language difficulties and the cultural value of technologies detracting from time with family were also noted
- that elderly people require more time to learn than younger people, and in the case of using digital health services this required time is expected to be much more
- a lack of suitably trained staff to provide training, and a lack of support to design and implement an intervention programme for elderly individuals
- that elderly people had limited access to computers, relatively few resources to obtain reliable information on many subjects, and a lack of ability to find and evaluate reliable information on the internet

Extrinsic facilitators include:

- perception that e-health services are of benefit and have the potential to support health care management, independent living, and self-managed care

- convenience afforded by e-health programs, allowing participants to progress their care at their own pace and accommodating issues such as reduced mobility

- ability to incorporate e-health into participant routines facilitated their use of these services.

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Technical needs and wishes are:

- Low-threshold access to electronic aids.
- Target group specific and individual offers.
- Involving the target group in technical development (AOK Study, 2020).

Content-related needs and wishes are:

- Access to evidence-based services.
- Considering an easy and barrier-free comprehensibility (easy language).
- Involving the target group in the development of content.
- Measures to increase adherence. (AOK Study, 2020)
- Acquiring the necessary knowledge about searching and assessing online health information
- Identifying reliable information sources

Summarized we should consider:

1. Making easy training materials in order to be clear and give the opportunity to understand well the meaning of DHL.
2. Insert examples and practical exercises that could be repeated by people in third age when they are alone.
3. Making training-videos that could be seen with people in third age. Videos are easy to understand and could be played more time.
4. Regarding previous studies, interventions (training programmes) mitigate the effects of low literacy skills (Sheridan et al., 2011), or, in other words, health literacy intervention affects overall health positively by enhancing people's abilities to assimilate and absorb health information
5. The results show that four different intervention methods could be used to increase elderlies' health literacy skills in the case of using digital health services.
6. Besides, before implementing any training sessions, barriers of learning shall be identified and tackled.
7. The main five intervention methods are
    - tailored (individualistic) intervention
    - collaborative learning
    - the teach-back method
    - hands-on learning,
    - and multi-method intervention.

8. In order to provide a meaningful starting point for e-training, we should start from concrete problems, based on the concept of problem-based or research-based learning. For this purpose, the case studies were designed and a framework for the development of the training but also for the learning activities. Working with real-life case studies is particularly suitable for linking theory and practice and for promoting reflection and analysis skills.

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6.2 Conclusions and guidelines from the interviews and case studies

Below are the guidelines that can be derived from the statements of the interview partners. The source is always marked with DTG (=Direct target group), ITG (=Indirect target group) and DHL-E (Digital health literacy Expert).

The following categories are analyzed in turn:

- **Didactics of the e-learning platform and app**
- **Consider motivational factors**
- **Content and structure of the e-learning platform and app**
- **Methods/modes of presentation of the e-learning platform and app**
- **Technological requirements/framework**
- **Social embeddedness**
- **Political lobbying**

Didactics of the e-learning platform and app

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Guideline	Source (Q = Question)	Content of Source (example)
▪ When it comes to linking to participants' **prior knowledge and experience with DHT** (Prior knowledge as a strong predictor of future learning success), it might be helpful to make a reference to the requirements during the Corona pandemic ▪ As for those over 65, a **specific disease** might be relevant as a trigger for engagement with DHT that could be referenced.	DTG (Q2), ITG (Q6)	Some of the participants from Germany, but also Italy, mention the effects of the Covid pandemic as a point of contact with DHT: "This course [using my tablet] was on how to manage the Covid emergency situation, hygiene and how to dress elderly people without hurting them" (GR). Most given answer is the approach caused by a medical issue, a surgery or other health problems. "In the past, I was really sick and I had to approach digital health technologies" (IT).

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▪ Since prior experience on the topic of digital HEALTH technologies differs even among participants who have basic digital competencies, there is a need for **differentiation within the learning pathways** (e.g., basic level, basic level, expert level): "how can I "take a shortcut" if the basic level is too low for me?", "how can I assess what level I am at?", "where can I find a harder task if I already have some prior knowledge?"	DTG, Q2, Q3, Q12, DHL-E (Q9, Q16)	"*I use the internet if I have a specific question and search for products that assist me in care, where do I get support*" (DE). However, there are also participants who report little to no contact: *"I have no experience with DHT, neither work nor private"* (GR). ▪ *"pre-condition is that the person knows how to handle a smartphone or has some basic skill regarding technology"* (DE) ▪ *"Or you have to divide between beginner and more advanced. So people without any knowledge can start with the basics about tablets, smartphones and also apps and then later you can specify on healthcare apps"* (DE) "There is a high knowledge of basic technologies among young, low trained caregivers. In the under-50 age group, knowledge is almost 100% but, unfortunately, above this age it drops by half" (IT). "*Do not lose sight of the fact that people really often start where you turn a device on and off*" (DE).

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▪ The aim of knowledge/competence transfer should be, in the sense of the specific Digital Health Literacy (Kolpatzik, K., Zeeb, H. and Sörensen, K., 2020) and in line with the subscale "Data literacy", to **promote** the Ability to collect, manage, evaluate and apply data with **a critical mind** and not "to do pure marketing".	Literature Review + DTG, Q4, Q10, DHL-E (Q17)	In addition, reference is made to balancing processes to be made: "... of course your privacy is affected and you are monitored, but you have the freedom to stay at home" (DE). *"In order to search information for themselves they should be able to use google, what key words should I enter and how do I identify a reliable source"* (DE) "Unbiased people who give neutral advise" (DE) The components sustainability and legal and ethical aspects need to be looked after too.
▪ Wherever possible, a "**hands-on approach**" should be used to impart knowledge and skills, and participants should actively do and try out as much as possible themselves.	DTG, Q5, Q12	*"There is also a need for us to familiarise ourselves with existing tools and applications"* (GR). *"Not just showing them how to do it, but really working with them that they have to do it themselves"* (DE) *"The use of practical examples"* (GR)
▪ **Problem-based learning**: Concrete questions with case studies from everyday life form a good starting point for acquiring new knowledge/skills.	DTG, Q5, Q10	*"There is a need for well-structured, progressive training that sets out the framework in which digital health technology will help carers, and analyses how we can use digital health technology on different occasions and in different circumstances, using clear examples and case studies"* (GR).

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		***"**Then they need easy, step by step explanation what they are supposed to do (if they want to use tele-medicine for instance)"* (DE)
▪ It should be made clear that the content of the e-learning platform and app is also subject to constant change. Accordingly, it is necessary to find the **balance between teaching BASIC competencies** (whose expiration date is shorter) **and the need for very CONCRETE application** examples/instructions.	DTG, Q6	*"The technological progress will continue and there will always be new methods"*
▪ It is not enough to simply "put an e-learning platform online"; instead, the target groups must be **actively addressed** within the scope of the available possibilities, ideally through accompanying **low-threshold** face-to-face offers. There needs to be appropriate involvement, selection and preparation of both mentors and people over 65.	DTG (Q10, Q13, Q15)	▪ *"Offers, such as the Internet consultation hour or technology café"* (DE) ▪ outreach services: *"Actually going to the people"* ▪ *"I think in person meetings are better especially in the beginning so the participants can have some exchange. Zoom-Meetings could be the 2nd or 3rd step when they have some experience"* (DE) ▪ "Partly via Zoom invitations, then of course send them to different homes, also for the older generation. But also for people who want to talk to people, on the spot or don't have the technical possibilities, like a camera (…)"

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		(DE) ▪ "would try both ways in person and digital, so maybe trying hybrid" (DE)
▪ If necessary, **motivational incentives** can be provided. Note: here it is important to weigh the extent to which extrinsic reward and intrinsic motivation might conflict with each other.	DTG (Q13)	▪ *"An idea could be to work with rewards (…small medals and also other gifts)*" (DE)
▪ Promote/provide sustainable learning and practice opportunities.	DHL-E (Q8)	*"After the first approach to DHL, the over-65 needs daily practice in the use of new technologies because they lack of constancy in applying new technologies" (IT).*

Consider motivational factors

Guideline	Source	Content of Source (example)
▪ To ensure stakeholder motivation, there needs to be evidence of very tangible benefits among target groups that result from the use of Digital Health Technologies. These points are described below and should be taken into account, for example, when creating scenarios (problem-based learning):	DTG (Q4, Q9), ITG (Q2, Q3),	▪ The whole subject needs to be presented and taught positively. Elderly people need to see it as an advantage to learn about digital health technologies. ▪ "For me, digital health technologies will enable me and my husband to save valuable time in terms of commitments

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○ Save time ○ Increased autonomy ○ Improved communication ○ Better problem solving/information ○ Strengthening social inclusion ○ Increased safety ○ Increased individual freedom and autonomy and self-management ○ Better “date-based” treatments ○ know more about the own health and health issues. ○ Access to information, help and medical advice from home. ○ Daily health or illness monitoring and tracking of symptoms – the data is sent to a doctor, which can be a huge benefit for elderly people when it comes to managing symptoms, medication and illness alone at home. ○ Mental Empowerment	DHL-E (Q3, Q4, Q5, Q16)	(physiotherapies, kinesiology, medication) around my husband's care and also in terms of bureaucratic matters (GR)". "Things can be done faster and more effectively” (DE) [and you can] “get a doctor's prescription immediately (IT)". ▪ booking appointments with the doctor (IT) and telemedicine (DE), or the possibility to find needed support faster via app. ▪ Most answers were about communication with medical staff or information gathering. ▪ "you can stay at home longer” (DE) ▪ Especially elderly people benefit from digital health technologies because it allows them to get information or help without deplacement. ▪ Another point is the control of the home via apps (e.g. light etc.) (DE). ▪ "One acquires more knowledge and becomes more skilled in talking to medical staff” (DE). ▪ "I can recognise a problem better. For example, if someone says: I feel dizzy. Then I can think about what help I give him so that he is less afraid of the dizziness? What is the

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		trigger for the dizziness? Medication, not drinking enough, etc. So I gain some knowledge and can find a solution more easily" (DE). ▪ "(...) any system or tool that allows me to have a direct link with my mother's status and health would give me peace of mind and also valuable
▪ In order to ensure the motivation of those involved, on the one hand **possible barriers should be pointed out or "cleared out of the way"**. The following were mentioned in the interviews: ○ It is pointed out that it would be helpful to provide information about entitlements and funding channels ○ Be able to evaluate/ensure data protection ○ Unclear benefits ○ Fear of making mistakes	DTG (Q4, Q5, Q10); ITG (Q5)	▪ *"It has to become cheaper, more affordable [and] easier"* ▪ "Data protection must be guaranteed, security" ▪ "I am not sure about data protection" (DE) and "It is difficult to find good information, even on the internet, which site offers reliable information" (DE). ▪ "I think the technologies are all interesting, but I don't have a specific need, so I don't use them" (DE). ▪ *"Taking away the fear"* (DE) ▪ I am thinking about the possibility of mistakes by the technology that can prove to be crucial for my health" (GR).

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▪ It should be noted that potential participants may not see any benefit at all in using DHT or, in the other extreme, may somewhat overestimate their current abilities. It might be a good idea to create a "cognitive conflict" here (according to Piaget), which puts one's own highly rated abilities to a practical test.	DTG (Q5), ITG (Q4, 7), DHL-E (Q3)	▪ "I think that we don't need to improve more digital health technologies because we are doing great at work" (IT) or with the following reasoning: "It is difficult to use the new technologies, we prefer to use pen and paper" (IT). "Now I am old and I do not think I will use them better than now" (IT). Some say they don't need it at all. "People over the age of 65 are largely not familiar with digital health technologies and consider only a visit to the specialist to be acceptable. In order for this to change it is needed an awareness and information campaign based on customized training and education material that can persuade and motivate older people, offering them tangible benefits and solutions to their health problems" (GR).

Content and structure of the e-learning platform and app

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Guideline	Source	Content of Source (example)
▪ An overview of (the state of) DHT should be provided.	DTG (Q13, Q14, Q17); ITG (Q1, Q6)	▪ “Good knowledge upon the application of digital health technologies” (GR) ▪ “to learn well the function of the platform, to learn well the current issues on DHL” (GR) ▪ as “acquiring experience with DHT and knowledge about the recent developments” (IT) ▪ “And my idea would also be, with regard to all these aids, that there is also a clear examination by experts and that you have digital pages where it is precisely listed: There is this, this and this” (DE) ▪ Specific digital health technologies aren´t that known knowledge. Elderly people need to know how to use digital health technologies. Part of it would be: o how do I use these offers? o how can I order them online? o Where can I find providers? o Where can I perhaps try this out? o For services, the question would be via which platform, which app do I need to download?

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▪ Mentors must also be provided with **didactic knowledge/**competencies and should be selected appropriately	DTG (Q14, Q15, Q16), ITG (Q11, Q12), DHL-E (13)	▪ "Communication is an important aspect, how do I talk to them?" (DE) ▪ "How to talk with them, look at them, trying to have eye contact, to speak loud, clear, slow" (DE) ▪ "You need patience with older people" (DE) ▪ *"A course for learning how to deal with people, so how to deal with really all kinds of patients and residents, because there are various"* (DE) ▪ "You need open people; you need to make sure that they are people who speak clearly, loudly and kindly enough to people" (DE) ▪ The mentor should be patient and teach the way of using digital health technology step by step. The responds weren´t very specific from each country. Interview partners from Greece did not give any answer. ▪ A lot of respondents did not give an answer to this question. Patience, a simple language and teaching in small groups were considered as helpful. ▪ A mentor should be enthusiastic, patient and committed. He or she should be able to work well with seniors and have knowledge regarding digital health technology. Such as

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		media education skills, basic digital competence, but no programming skills. Videos and working with pictures can be helpful. ▪ *"The training should be done by people who have a clear knowledge of the special issues that people over 65 face, and of how they should be introduced to them for learning new skills and applying them in daily practice"* (GR).
▪ Is it possible to derive a "guideline" for the content from the requirements on the right?	DTG (Q14), ITG (Q5)	▪ *"English language skills can be useful to find more content in google or to find it easier/faster"* (DE) ▪ "The vocabulary used may prevent me from using digital health technologies because English is used for everything (also in health terminology). I must know this new vocabulary, which is neither English, because it is often Italianized" (IT).
▪ Provide test for **self-assessment**		▪ *"There could be a test in which you can prove your ability to use digital technology and also see what you are missing"* (DE).
▪ Teach **reliable search strategies**	DTG (Q15)	▪ *"Maybe you can also show people how to google properly, that you have to search further down, that you have to look in forums"* (DE)

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▪ Address not only physical but also **mental health.**	DHL-E (Q3, Q17)	▪ *"Social participation as a very important aspect for older people (there are more and more older people who live alone), this also includes digital sovereignty, some social discussions only take place via social media" (DE).* ▪ Applications to increase social participation. Mental health needs to be focused on too.
▪ A **clear structure** and **defined goals** support the learning success	DTG (Q14)	▪ "*Small units" (DE)* ▪ *"Have a clear learning structure and learning objectives"* (GR) ▪ *"The training course should be simple and clear, so you can learn step by step"* (IT)

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▪ Create small **groups** and provide short interventions	DHL-E (Q10, 12)	▪ *"Small groups max. 5 persons; short interventions max 30 minutes"* (DE) Trough courses: A small group size has been mentioned as an important component. Also lessons, which aren't too long, with a lot of repetition instead. The introduction should be very practical and in a simple language. ▪ A small group size has been mentioned as an important component. Also, lessons, which aren't too long, with a lot of repetition instead. The introduction should be very practical and in a simple language. An easy access and data security.
▪ Contact Expert	DHL-E (Q14)	*Teaching materials available online, a section of the platform where caregivers can contact a DHL expert in case of need and online tutorials that can be repeated.*

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Methods/modes of presentation of the e-learning platform and app

Guideline	Source	Content of Source (example)
▪ Provide a handout	DTG (Q13)	▪ *“A very simple written guide and a mentor teaching me are important”* (IT)

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▪ Use a variety of methods to present the learning content	DTG (Q16, Q17), DHL-E (Q12)	▪ *"(…) What I liked most was the variety of the applications of the training material which make the learning much enjoyable and more experiential"* (GR) ▪ *"I like animations and small games, working with rewards in one app you received a flower and if you answered correct the plant"* (DE) ▪ "a video helps because it also ultimately bypasses language barriers. You can also watch it several times and not only once, I can lay the tablet or smartphone next to me and watch the video to follow the explanation" (DE) ▪ "Variety is always good, the less text the better. I hate reading texts, so I personally am rather visual and audio" (DE) ▪ "Reflect everyday life, in videos show not only young, slim, athletic people" (DE) ▪ "*Presentations with small text and legible letters (easy reading) using photos and videos to understand the material. Practical application of technologies for better understanding of knowledge and familiarity with applications"* (GR).

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Overall, the interviews indicate that there are starting points or a need for action for all the influencing factors also mentioned in the definition of Griebel et al. quoted after, Samerski & Müller 2019, p.43 (“eHealth literacy includes a dynamic and context-specific set of **individual** and **social** factors as well as **technology** constraints (…)”, cf. chapter Definitions and conceptual frameworks).

The setting of the different people seems to be very important: how much help do they have in their everyday life, do they live at home and how good is the internet connection, how close are they with their children etc. It seems like the setting is quite important weather they are using digital technology or not (ITG, Q15). These things are now presented below.

Technological requirements/framework

Guideline	Source	Content of Source (example)
▪ Technical restrictions should be observed and eliminated where possible.	DTG, Q5, Q10, Q16, DHL-E (Q7)	Wifi needs to be installed and should be accessible everywhere „Payers and providers should develop a wearable with an app that cannot be manipulated, updates automatically, and makes information accessible to different groups” (DE). „Payers and providers should develop a wearable with an app that cannot be manipulated, updates automatically, and makes information accessible to different groups” (DE). “It might be helpful to secure the tablet, to change the seetings in such a way that they are not able to do

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		everything, in order to give more security” (DE) Digital health technologies often are too complicated, not known enough or the importance / benefit of their usage is not clear. “Too complicated (if you buy a smartphone today, the first thing you have to do is create an account and have an email address = insurmountable hurdle for some)” (DE).

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▪ Where influenceable, technology should be adapted to age-specific requirements/restrictions.	DTG, Q12, Q14, DHL-E (Q10)	▪ "*Large, large fonts for people who no longer see well"* (DE) ▪ *"And good audio so also for listening"* (DE) ▪ *"Apps in this area are definitely more suitable for a tablet than for a smartphone then"* (DE) *"Well structured and user-friendly applications and tools so for older people to be able to read the information and apply it (…)"* (GR) ▪ *"The language has to be comprehensible"* (IT) ▪ One respond was that digital health technologies need to be more adapted to elderly people first – or at least, apps especially for elderly people should be used in the trainings.

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▪ secure low threshold access	DTG (Q16)	▪ "*And e.g. also important is a password storage at the beginning. Not that every time you log in, you have to enter a lot every time you log in to the app. Then people don't feel like it, because I don't either. And then I don't open that app anymore"* (DE)
▪ Select suitable devices and recommend them if necessary?	ITG (Q8)	▪ *Most given answer is the mobile phone or the computer because it is easier to use.* ▪ *"I prefer the PC, because it is large (for the screen's and keys' dimension). It is easy to bring the tablet with me (I bring with me also the notebook, I put it in a bag" (IT).* ▪ *Some also use a smartphone or wearables.*

Social embeddedness

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Guideline	Source	Content of Source (example)
▪ Appropriate ways to socially embed learning should be sought. These could be, for example, personal contacts/relationships or learning in groups.	DTG (Q12), ITG (Q4, Q9, Q10), DHL-E (Q8, Q11, Q17)	**Personal accompaniment** ▪ "That you help them personally" (DE) ▪ "Constant and concrete help is essential to learn effectively" (IT) ▪ The training needs to be in person – and the person who is teaching needs to be patient and speak in an understandable way. ▪ "He/she should always be available to come to my home in order to give me the explanations" (IT). **Social embedding** ▪ "And when you work together, laugh together, that's how we did it in the course and it worked really well" (DE) ▪ " (…) apply it [information from applications and tools] in collaboration with the caregiver or the health staff" (GR) ▪ There must be somebody who is there to show how it

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		works. ▪ It has to be easy to use and there must be somebody who is there to show how it works. ▪ On the one hand it is important to actively seeking out the target group and to provide a long-term support in the use of these technologies. On the other hand a permanent contact person to help with problems and questions is needed and instructional videos can be helpful. ▪ It is very important that “a real person” teaches elderly people because the direct contact would be the easiest and most comfortable way for elderly people to learn. For people in third age the benefits of using digital health technology correctly are the general improvements in quality of life and health. ▪ “Train the trainer was also recommended. Does this mean for us that, under the keyword "sustainability", each country must consider for itself how it can ensure that the learning platform is actually used and that seniors are really supported through it” (DE).

Political lobbying

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Guideline	Source	Content of Source (example)
▪ Refinancing of digital health offerings should be ensured.	DTG (Q10), IDT (9)	*"Ensure that the costs, e.g. for a wearable, are regulated and covered by long-term care insurers"* (DE) The tools have to match the individual needs and it should be affordable

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6.3 Summary and outlook

In this guidelines report we have included the findings of literature reviews from Italy, Greece and Germany and summarized the conclusions in chapter 7.1. To verify these results and also get deeper and more personal details we also conducted interviews in these countries with three different participant groups. The main results and important aspects were described in the previous chapter. In order to define the target group and the setting of the DIGIHALL project and platform more specifically we created the case studies which describe a concrete scenario where the DIGIHALL training can meet the needs and improve the necessary skills.

We have gathered a lot of valuable information especially regarding the needs and requirements which form the above guidelines. The next step is to evaluate and prioritize these as not all of them can be met within the project. On the one hand some needs cannot be met due to technical restraints others cannot be met due to time or personnel resources. As we also found other projects and best practices we already looked into them and started networking in order to be complementary. Generally speaking, our approach to this complementarity is as follows: on the one hand, we will accelerate the process of involving more people in existing practices on the other hand, we will address areas or sections that are not covered by existing good practices.

Then we will transfer the needs and requirements into competences and learning objectives (PR2) so we will be able to develop the learning materials and decide on the platform design.

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Appendix I: Overview of target groups and terms

				Assistant in Care
				Assistant in everyday living
				informal caregiver = family, friends, neighbors
				Volunteers
Country	**Name**	**Original name**	**Possible translation**	**characteristics / educational backround**
Germany	low-trained caregivers	Pflegehelfer*in	Nursing assistent/aids	Assistant in nursing, 1 year of training
Germany	low-trained caregivers	Servicehelfer*in	service assistent/aids	Assistant in household, training on the job, vocational training, 2 years
Germany	low-trained caregivers	Alltagsbegleiter*in	Trained every day companion	2 years of training (in BW)
Germany	low-trained caregivers	Betreuungskraft nach §43b / §53b		160h plus 2 weeks practice
Germany	Informal Caregivers	Informelle Pflegende, nicht professionell Pflegende	Informal caregivers, non professional caregivers, relatives	non professional caregivers
Germany	Volunteers	Ehrenamtliche Mitarbeitende	Volunteers	no or minimal training
Greece	low-trained caregivers	Γηροκόμοι	Geriatric carers	Vocational education, 2 years of training, also social tasks
Greece	low-trained caregivers	Βοηθοί νοσηλευτή	Nursing aides	Vocational education, 2 years of training
Greece	Informal Caregivers	Άτυποι φροντιστές, συγγενείς	Informal caregivers, relatives	None
Greece	Volunteers	Εθελοντές	[TRANSLATION]	[Charasteristics]
Italy	low-trained caregivers	Operatotre Socio Sanitario (OSS)	Nursing assistant	1010h course (550h lessons; 450h internship; final exam) 1 year of training
Italy	low-trained caregivers	Operatore Socio Sanitario Specializzato (OSSS)	Specialised Nursing assistant	OSS qualification + specializing course
Italy	low-trained caregivers	Assistente Familiare qualificato	Qualified in-home care attendant for elderly	≥500h course. Also partly take over nursing/hygiene activities
Italy	no-trained caregivers	Assistente Familiare	In-home care attendant for elderly (without qualification)	no qualification. less in the area of care/hygiene.
Italy	Informal Caregivers	Familiari	Family Members	no qualification
Italy	Volunteers	Volontari	Volunteers	no qualification
Italy	Volunteers	Volontari del Servizio Civile Universale	Alternative Civilian Service	8-12 months of training, mainly assistant and daily activities, similar to BUFDI in Germany

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Appendix II: Interview participants

Summary of descriptive data from Germany, Greece and Italy

Indirect Target Group

Participant Code	Age	Sex	Labour Situation	Care Situation: care receiver	Time receiving care
G30062022T	between 65-74	male	Pensioner	None care receiving	
M09062022S	between 75-84	female	Pensioner	family members help out by household tasks if needed, and if there are questions about the use of new technologies	1-5 years
Z14062022F	Above 85	male	Pensioner	resident of a nursing home, mostly independent/self-determined, still capable of doing anything	1-5 years
M060622P	between 65-74	female	Housekeeper	Living in her own home needing help with errands	
V190622P	between 75-84	female	Housekeeper	Living in her own home, needing help for the heavier household tasks	

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A080622P	between 65-74	female	Pensioner	Living in her own home, needing mostly psychological help and company	
F01072022J	between 65-74	female		Just help with new tecnologies (PC or tablet issues)	1-5 years
G01072022J	between 65-74	male		Just help with new technologies (PC or tablet issues)	1-5 years
G07072022J	between 65-74	male		No support needed	

Direct Target Group

Participant Code	Age	Sex	Labour Situation	Care Situation: Caregiver	Time giving care
A19062022D	between 65-74	female	Housewife	informal caregivers	1-5 years
K14062022F	under 30	male	Social Worker in training	Low-trained (until graduation)	1-5 years
W22062022S	under 30	female	Voluntary year of Social Service	volunteers	less than 1 year (job experience)

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B29062022S	under 30	male	Technical Service Assistant	Low-trained	1-5 years
H120622P	between 50-64	male	University degree; Biologist	informal caregivers	
E130622P	between 30-50	female	University degree; Physiotherapist	informal caregivers	
P140622P	between 50-64	male	University degree, Teacher	informal caregivers	
S070522P	between 75-84	female	Primary school, Housekeeper	informal caregivers	
M13062022J	under 30	female	Alternative Civil Service	volunteer	1-5 years
S23062022A	between 50-64	female	Qualified in home care attendant for elderly	Low-trained	11-20 years (Job experience)
M23062022A	between 50-64	female	Family members: Taking care of 90 y.o father	informal caregivers	1-5 years
S23062022J	between 30-50	female	Nursing assistant	Low-trained	less than 1 year (job experience)

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DHL-Experts

Participant Code	Age	Sex	Labour Situation	Job Experience
J30062022E	under 30	female	Consultant hospital company of Baden-Württemberg	less than 1 year (job experience)
D22062022S	between 50-64	male	Project Management at the Department for digital and social Participation	1-5 years
V24062022S	between 30-50	male	Project Management at the Wohlfahrtswerk	11-20 years
M040722P	between 30-50	female	Psychologist	6-10 years
P300622P	between 30-50	male	Social worker	6-10 years
D280622P	between 30-50	male	Social worker	11-20 years
S04072022J	between 65-74	male	Head of Digital Transition of the Municipality of Frosinone (Rome)	1-5 years
M27062022J	between 65-74	male	Head of the department of cardiology and cardiac surgery of Ancona	11-20 years
D06072022A	between 50-64	male	Qualified IT Teacher recognized by Marche Region	11-20 years

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Appendix III: Interview Guidelines

Preparation for interviews

- First, translate the interview template into your own language. This way you will not lose the meaning of the question.
- It is preferable do a test interview. Read all questions carefully, to keep clear focus on the intention, and test the environment/technological equipment.
- Plan some additional time before the interview. Leaving a few moments before starting helps the interviewee to adapt the situation.
- Choose a setting with no distraction yourself and ask the participant to do the same. Avoid noises, ensure that the interviewee is comfortable (you might ask them if they are), etc. Often, they may feel more comfortable at their own places of work, rehabilitation or homes.
- Explain the purpose of the interview and explain what the information will be used for, within the project.
- Address terms of the free and voluntary nature of the participation.
- Remind the interviewee that they don't have to say or register their name. The interview and the recording will start only after verbal approval from them and the interviewers. We will use the following code:

What?	**What exactly?**	**Example**
Name	first letter of your Name	**R**uth
Date	Date of Interview	01.02.2021
City	first letter of the city you life in	**S**tuttgart
Code		R01022021S

- Note any terms of confidentiality. Explain who will get access to their answers and how their answers will be stored and analysed. It is the researcher's responsibility to protect interview participants and the information they provide. Let them know the confidentiality of their identity and that they can withdraw from the interview anytime they want. Informed consent and information sheet will be provided and signed at this point.

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- Explain the format of the interview. Explain the type of interview you are conducting and its nature. If you want them to ask questions, specify if they're to do so as they have them or wait until the end of the interview.
- Indicate how long the interview usually takes.
- Tell them how to get in touch with you later if they want to.
- Ask them if they have any questions before you both get started with the interview.
- Don't count on your memory to recall their answers. Ask for permission to record the interview.

Conducting interviews

- Occasionally verify your recorder tools (e.g. camera, voice recorder) are working.
- Ask one question at a time.
- We should listen carefully to the response of the participant.
- Attempt to remain as neutral as possible. That is, don't show strong emotional reactions to their responses. Try to act as if "you've heard it all before."
- Encourage responses with occasional nods of the head, "uh huh", etc. Remember we want to obtain specific data but also significant personal information.
- Do not try to predict what kinds of responses we might get.
- Provide transition between major topics, e.g., "we've been talking about (some topic) and now I'd like to move on to (another topic)".
- "Don't lose control of the interview. This can occur when respondents stray to another topic, take so long to answer a question that times begins to run out, or even begin asking questions to the interviewer".

Immediately after interviews

- Verify if your recorder tools worked throughout the interview. Store the record safely.
- Write down any observations made or events happening during the interview. Please make sure to forward this information together with the transcript (English version) of the interview.

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Appendix IV: Interview summary by country & target group

The color yellow stands for Germany, red for Italy and green for Greece.

Direct target group (low-trained, informal caregivers and volunteers)

Perspective I direct target group: status/experience

16. Describe in what way you have contact with people over 65 in your professional or private everyday life, e.g. also in an honorary capacity.
Private: with parents, grandparents, neighbours, mother in law, landlady, seniors from church Professional: Advising older people on technologies, answering questions regarding smartphone, tablet or different apps etc. Offering different activities and care for older people in a nursing home 3 days a week Caring for mother and mother in law
M23062022A - I coordinate the home assistance service, so I am in contact with people who needs assistance. I have to listen the needs, our coordination job is to elaborate these needs. I and my colleagues have greater contact with users, we listen to them and take action regarding their requests. As for my private life (in relation to my father), I take care of the whole organization behind all the medical issues: medical visits and checks, programmed home visits, etc. **S23062022A** – I'm working with them because I am in-home care attendant for elderly people. **S23062022J -** I'm working especially with people with Alzheimer's and dementia so generally they're over 65. **M13062022J -** I get in touch by talking with them, it is a way to start a general conversation. My frist approach with them was through the alternative civil service.
1. I work at the Patras municipality as biologist. I am informal caregiver taking care of my mother who has Parkinson disease. 2. I am physiotherapist in a social welfare organization. I am informal caregiver for my husband who he is a person with disabilities. 3. I am physical education teacher in a public school in primary education and I am taking care of my mother who she has α chronic disease and mobility problems. 4. I am housekeeper and informal caregiver of my husband who has cardiovascular

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disease.
Summary: The interview participants have contact with the indirect target group (people over 65) through their following roles/functions: Volunteer: through alternative civil service or through volunteering. In particular, the interviewees from Germany report that they offer explicit advice to people over 65 on various digital technologies. Informal caregiver: The participants from Greece in particular all four described themselves as informal caregivers who either care for their partner or their parents. Low-trained caregiver: Here the participants report which components their job has: "*I have to listen to the needs, our coordination job is to elaborate these needs*" (IT). Overall, parents are also frequently mentioned as points of contact with people over 65 in the private sphere or one's own parents are also cared for, which is not surprising in view of the demographic development in the interview countries.

17. Describe where you have gained professional or private experience with digital health technologies.
During Covid we tried out a smartwatch to keep track on the steps, mobility and burned energy each day. So we could adjust our diet or went out for a walk. Using the **App** "**Digital Wellbeing**" to have an overview on the mobile phone use and being able to realize an increase and do s.th. Within a project older people receive a smartwatch and other sensors. These data is gathered and provided in an app and online platform for the seniors but also for healthcare professionals With colleagues and friends we discussed the e-prescription and tele-medicine One senior had an App for his wheelchair which he could use to navigate but also to see the air pressure on the wheels or to tell when a reparation or regular service was needed, etc. Covid Warning App or during covid when people went to a pcr test they often needed to scan a QR code with their mobile I did not, really, I search some things in the internet but I don´t use an app except counting the steps. One senior had an app for his wheelchair, with this he knew the exact pressure in the wheels, when to go to the service or reparation was needed, the status of batterie

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and he could navigate with it.

I also had to explain the Corona Warning App to many seniors. Many just bought a smartphone only to have this warning app and so I explained them how to use it. Especially how to scan the QR code.

I use the internet if I have a specific question and search for products that assist me in care, where do I get support…

M23062022A - I have no experience with DHT, neither work nor private.
S23062022A- Both in the workplace and in the private sector. I also attended a course using my tablet (a couple of months ago). This course was on how to manage the Covid emergency situation, hygiene and how to dress elderly people without hurting them.
M13062022J – I attended a course in digital communication. After that I worked for a communication agency.
S23062022J - I don't have any experience with DHT.

1. I have gained such experience through the latest developments concerning the e-prescription applications which I use for myself and my children.

2. Through e-prescription

3. Through e-prescription

4. I have not such an experience yet.

Summary:

Some of the participants from Germany, but also Italy, mention the effects of the Covid pandemic as a point of contact with DHT: "*This course [using my tablet] was on how to manage the Covid emergency situation, hygiene and how to dress elderly people without hurting them"* (GR). In Germany, the results show an overall heterogeneous picture: here, apps, e.g. one for navigating the wheelchair including further information on the service status, but also other sensors as well as the internet are mentioned as sources: "*I use the internet if I have a specific question and search for products that assist me in care, where do I get support*" (DE). However, there are also participants who report little to no contact: *"I have no experience with DHT, neither work nor private"* (GR).

18. Which digital offers, technologies and information are you aware of?
    - Which of these do you use yourself?
    - [Note to interviewer: give examples again if necessary, see presentation/explanation of research project].

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Social media like TikTok or Instagram or Facebook to get some fitness or diet tips

Learning App “Beginners support- digitally included“ in German (**Die Lern-App “Starthilfe - digital dabei“)** available in app stores. Especially older people are introduced to the first steps on a smartphone or tablet.

I have my insurance in the online portal where I then put my sick notes when I need some. Or send and I take a picture of it.

There are apps to track menstruation but you need to be careful with dataprotection

Smartwatches, apps and other programs included in fitness equipment to measure heartrate, steps etc.

Emergency button, device to take the bloodpressure electronically

electronic health record

sleeping mattress that measures the heartrate, sleeping phases, oxygen, snoring etc.

Using google to search for information

M23062022A - I don’t have experience.
S23062022A - I mainly use my tablet rather than my phone.
M13062022J - Websites, simple emails and WhatsApp. They are very useful, for example if the doctor has to send some important information, he uses it. An elderly person is obviously unfamiliar, so it often happens that you have to help out.
S23062022J - In the training course to become an OSS (Social sanitary Operator) we attended an IT classroom.

1. I am using digital technology to inform myself on various issues including health issues, and I know about assisted living tools, sensors, monitors and applications that can provide data on the vital signs of a person. I am using a smartwatch myself.

2. I know as well about digital tools and applications that enhance the autonomy and ageing well of people in third age. I also have a smartwatch.

3. I am not very familiar with these technologies, but I have heard about these systems.

4. I know some very basic things about these domain.

Summary:

Some of the participants have no or only very basic experience: *"I know some very basic things about these domain”* (GR). In the results from Italy, "websites, simple emails and WhatsApp" are still mentioned, which are also used for communication with the doctor. In addition to the use of social media, e.g. for fitness tips for themselves, extensive experiences are also reported in some cases: *“I am using digital technology to inform myself on various issues including health issues, and I*

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know about assisted living tools, sensors, monitors and applications that can provide data on the vital signs of a person. I am using a smartwatch myself" (GR).

Perspective II direct target group: development opportunities, chances, obstacles

19. What exactly do you think are the advantages for you personally in using digital health technologies in your everyday work and life?
It is the future, you can stay at home longer because these technologies provide a certain control you can stay at home at via tablet you have contact to a person regulary, you can have cameras at home, a watch measuring the heartrate, of course your privacy is influenced and you are monitored but you have the freedom to stay at home things can be done faster and more effective you can get more information in a shorter time, you can get an overview and prepare yourself for example to talk to the doctor you gain more knowledge and become more qualified to talk with healthcare professionals I can identify a problem better. For example when someone says: I feel dizzy. Then I can think about what aids I give him so that he is less afraid with the dizziness? What triggers the dizziness? Medication, not drinking enough, etc. So I gain some knowledge and therefore find a solution more easily. It would have been very helpful if there had been a page where you could have read about it: What a general practitioner is allowed to prescribe for a patient covered by the health insurance system and what else the patient or the person to be cared for has to pay for himself? I would also use the tablet to talk to doctors. So for me personally now I would use something like that. I would also send the medications and the sick notes, you could send everything already online, you would no longer have to drive here to the mailbox and post it in. E-prescription? In principle, yes it would be a huge benefit, but that would mean, I should have known from the outset: Ah, do I have a right to this item, KK often reimburses only certain aids, this information would be very good on a page.
M23062022A – Checking medical prescription the doctor send by email. **S23062022A -** I find them quite useful, get immediately a medical prescription is an example, this circumstance happened to me recently. I don't need a tablet for my job, I use this kind of instrument for personal things. **M13062022J -** The benefit is that you can communicate in a very fast way. You can

book an appointment in just 3-4 clicks.
S23062022J - I think that medical recipes are used more by nurses. The Whatsapp group we have among colleagues helps us a lot to get in touch very fast. For example, I'm following a boy with Down syndrome at home and undoubtedly the possibility to consult immediately the web is very useful. Being updated constantly, quickly and on a daily basis are important targets that can be reached with technology.

1. Regarding the provision of care for my mother, and since I am alone in taking care of her (with the assistance of my uncle), while I have a family with two kids and many running obligations, I would say, any system or tool that could provide me a direct connection with my mother's status and health condition would give me reassurance and also a valuable constant control over her health.

2. For me digital health technologies will allow me and my husband to save valuable time regarding the obligations (physiotherapies, kinesiology, medication) around the care of my husband, and also in relation with the bureaucratic issues around my husbands disability

3. From my point of view, digital health technologies can facilitate me regarding the time I need to spend for arranging medication, contacting the doctor, clarifying questions or issues aroused, during the care of my mother

4. Me and my husband we rely very much on our son for taking care of medical prescriptions and contact with the doctors. I suppose having the opportunity to also me take care of some things directly would be helpful, as long as I can be sure that I understand the information received.

Summary:

The respondents see the following advantages for themselves personally from the use of digital health technologies in their daily work and life:

Save time:

"For me, digital health technologies will enable me and my husband to save valuable time in terms of commitments (physiotherapies, kinesiology, medication) around my husband's care and also in terms of bureaucratic matters (G)". "Things can be done faster and more effectively" (DE) [and you can] "get a doctor's prescription immediately (IT)".

Increased autonomy:

"you can stay at home longer" (DE).

Improved communication:

"One acquires more knowledge and becomes more skilled in talking to medical staff" (DE).

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Better problem solving/information:

"I can recognise a problem better. For example, if someone says: I feel dizzy. Then I can think about what help I give him so that he is less afraid of the dizziness? What is the trigger for the dizziness? Medication, not drinking enough, etc. So I gain some knowledge and can find a solution more easily" (DE).

"(...) any system or tool that allows me to have a direct link with my mother's status and health would give me peace of mind and also valuable ongoing control over her health" (GR).

Possible barriers/approach points

It is pointed out that it would be helpful to provide information about entitlements and funding channels: *"Ah, do I have an entitlement to this item, health insurance often only reimburses certain aids, this information would be very good on one page. Health insurance often only reimburses certain aids, this information"* (DE).

In addition, reference is made to balancing processes to be made: *".... of course your privacy is affected and you are monitored, but you have the freedom to stay at home"* (DE).

20. What conditions would have to be in place for you to use more digital health technologies in your daily work and private life?
It has to become cheaper, affordable A training that supports someone to learn about apps and so on Building trust Data protection must be secured, safety Wifi has to be installed and should be accessible everywhere Simplify the application process for better aids, digitalize it Contact and ordering process with medical supply store should be easier and possible online, medical supply store always wants original prescription in advance
M23062022A – I think that we don't need to improve more digital Health technologies because we are doing great at work. We are just use PC for communicate with the ASUR (Regional Administration for Health). Also, I don't need to improve any Digital Technology in my private life. **S23062022A –** It's difficult to use the new technologies we prefer to use pen and paper.

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M13062022J – It can be very helpful in various aspects because it optimizes times. Having the opportunity to tighten the time: for example, getting a recipe online could be faster if ordered at the Pharmacy and shipped directly at home.

S23062022J - It could be helpful because I could understand better the physical condition of the person who I am taking care of.

Results:

1-2-3-4

- There is a need for a well structured education in a progressive manner, that will set up the framework upon which digital health technology is going to help carers, and will analyse through clear examples and case studies how we can use digital health technology in different occasions and circumstances
- There is also a need for us to get acquainted with the existing tools and applications and their connection with the different fields of health and social care domains, as it is the health management, the medication, the contact with the health staff, etc.

The following things were mentioned as prerequisites for integrating even more digital health technologies in private or working life (DE):

- *"It has to become cheaper, more affordable [and] easier"*
- *"Data protection must be guaranteed, security"*
- *"Wifi needs to be installed and should be accessible everywhere".*

In addition, the need for proper training was mentioned:

"There is a need for well-structured, progressive training that sets out the framework in which digital health technology will help carers, and analyses how we can use digital health technology on different occasions and in different circumstances, using clear examples and case studies" (GR).

As well as relevant overviews/introductions to digital health technologies: *"There is also a need for us to familiarise ourselves with existing tools and applications"* (GR).

But there are also voices from Italy, be it minor ones, that see no need for further development, either because everything is already known "I think that we don't need to improve more digital health technologies because we are doing great at work" (IT) or with the following reasoning: *"It is difficult to use the new technologies, we prefer to use pen and paper"* (IT).

21. In which areas/in which tasks of your overall work and private life could digital health technologies also be helpful?

They can be helpful to:

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- Be reminded to walk more, to be more active
- Be reminded of appointments
- Talk to a doctor or other professional via tele-medicine, to collect the medical history and to arrange an appointment for an in person meeting if necessary
- Make processes faster and more effective like for example sickness notifications, online prescriptions
- Safe paper and ways when prescriptions etc. work online

M23062022A – I just need to use properly my email.
S23062022A – I don't know.

M13062022J - The technological progress will continue and there will always be new methods.
S23062022J - Basic training for Operators is essential. This part has to be periodic and well structured.

Results:

1-2-3.

- In having a better coordination and effectiveness of my care tasks, based on a more frequent or available support network with the health care staff

- In saving valuable time from my professionals or family, social obligations

4. In receiving more information exactly at times I need it

Summary

The answers show a high range and go from *"I just need to use properly my email"* (IT) to *"The technological progress will continue and there will always be new methods"* (IT). The communication aspect is also mentioned: *"In having a better coordination and effectiveness of my care tasks, based on a more frequent or available support network with the health care staff"* (GR). Reminder functions of apps (e.g. to move more, telemedicine, digital health record) are also mentioned.

22. What prevents you from using digital health technologies?

I think the technologies are all interesting but I don´t have a specific need so I do not use them.

I am not sure of the data protection

It is difficult to find good information even in the internet, which page provides reliable information

M23062022A - There are no impediments.

S23062022A- I really don't know.

M13062022J – The fact that the elderly are not familiar with DHT prevents me from

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using DHT with them. If an elderly person has no technological perception, it is an obvious impediment. I think there is a huge difference between a 70-year-old and an 80-year-old. An elderly person is always reluctant to approach new technologies, a lot of patience is needed. **S23062022J -** I don't find a particular impediment, but the human and relational part is missing. I think that using DHT is a colder and more impersonal method.
Results: 1-2-3-4: - The lack of public awareness on the digital health framework - The lack of education on the use of digital health systems and tools 4: - The lack of digital literacy
While two people (from Italy) either do not know the answer or answer *"there are no impediments"* (IT) when asked about barriers to use, otherwise the following answers are given: **Unclear benefits** *"I think the technologies are all interesting, but I don't have a specific need, so I don't use them"* (DE). **Privacy concerns** and **reliability of information**.... ... also play a role "*I am not sure about data protection*" (DE) and *"It is difficult to find good information, even on the internet, which site offers reliable information"* (DE). As well as, *"The fact that older people are not familiar with the DHT discourages me from using the DHT on them"* (IT). In addition, the following were also mentioned - The lack of public awareness about the digital health framework and the lack of education about the use of digital health systems and tools (GR).

Perspective on people over 65

When you think of older people over 65 with whom you have contact…

23. What opportunities and benefits do you see for them in using digital health technologies?
It can be a benefit using a smartwatch because you can see what you achieved during the day, you can get a feeling for your heartrate and it can be success to see although I just walked short distances I still managed to have xxx steps over the day. Using digital technologies helps them to keep up with the developments, they could find things faster, keep in touch It can support individual freedom and autonomy and self-management. They don´t

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need someone caring for them. People with diabetes for example can monitor their blood glucose and respond to deviations. The same works with heartrates or blood pressure.

But it could also make it easier if they already have a caregiver or with communicating with healthcare professionals. The doctor or a nurse could access the data of the smartwatch and check maybe does the medication work? It would be helpful to adjust the dosage much better.

So to summarize all this data and provide an overview is a huge benefit.

Some of the smartwatches or other apps are already able to send out a signal when someone falls, they can also directly share the location so help can be sent.

The tracking technology is also a benefit for people with dementia and their caregivers as they can be located when they do find their way.

M23062022A - I don't see any advantages because, for example, my father has sight limitations and cannot use a phone or other technologies. With regard to the over 65s in general, it depends on individual cases: if properly educated, there could be positive opportunities.
S23062022A – The opportunity for an elderly person is clear, he could use it to get in touch quickly with the doctor, family, relatives, friends (for example with a mobile phone, tablet).
M13062022J – There is no doubt that technology helps them to get out of isolation.
S23062022J - The Elderly are not very familiar with technology, but perhaps with the help of operators the situation could change. The smartphone has become a very common tool and after the pandemic emergency, its use has become very frequent.

Results:

1-2-3-4:

- More immediate response to health needs, which is very important for them to avoid possible risky situations
- Better and more targeted communication with caregivers. Digital health literacy may help care recipients and caregivers build a certain care framework and also to follow a specific protocol of care, avoiding possible misunderstandings or disputes
- Better understanding of the course of their health, and because of this, better commitment and motivation to the daily care tasks

As far as the indirect target group is concerned, i.e. people over 65, the following advantages are seen:

Strengthening social inclusion: *"There is no doubt that technology helps them to get out of isolation"* (IT) and [a] *"better and more targeted communication with caregivers"* (GR).

Furthermore, increased **safety**, e.g. through automated emergency call functions of a smartwatch or also through tracking technology for people with dementia, are

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mentioned (DE).

Increased **individual freedom** and autonomy and self-management are also mentioned: "*They don't need someone caring for them. People with diabetes for example can monitor their blood glucose and respond to deviations*" (DE).

The use of recorded information, e.g. via a smartwatch, also enables **better treatment** (DE) as well as better cooperation between those involved in care/treatment (GR).

However, it is also pointed out that the extent of the benefit depends on the individual case and the appropriate training of the elderly (IT).

24. In which areas/tasks could digital health technologies be helpful for people over 65?

It can be helpful to use more tele-medicine and also to talk with insurance companies

Organising and remembering passwords

With an app they can find assisted living facilities as well as other support faster and easier

They can navigate and control their wheelchair with an app.

Or someone who's bedridden can get a kind of, like a little gripper arm that you control with your cell phone. They can adjust their lighting in the room. Snoezle therapy you could also control everything through the app so to speak.

M23062022A - For youngsters contacting a doctor through emails is simple but for people over 65 it could be a little bit difficult.
S23062022A – I think that the main advantage could be the fact that you can book an appointment with the doctor through the mobile, tablet or computer.
M13062022J – I don't know.
S23062022J - I don't know.

Results:

1-2-3-4:

- To be more confident and autonomous. Knowing that there is constant support available, and even the monitoring of vital signs, older people may feel well to unveil their potential in various fields with positive impact to their mental, physical, social and psychological status
- To give them secure prevention guidelines. The role of prevention is very important for avoiding aggravating situations, in that sense having valuable information as a warning, may prove to be very crucial for preserving their quality of life

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Summary:

Possible fields of application for DHT are booking appointments with the doctor (IT) and telemedicine (DE), or the possibility to find needed support faster via app. Another point is the control of the home via apps (e.g. light etc.) (DE).

"Knowing that there is constant support available" (GR), *"and even the monitoring of vital signs"* (GR) [could have the following consequence]: *"To be more confident and autonomous"* (GR).

25. What do you think is necessary to integrate more digital health technologies into the everyday life of people over 65?
Offers, such as the Internet consultation hour or technology café, where seniors and younger people can also meet there and exchange information. Actually going to the people, Unbiased people who give neutral advice, not by companies that want to sell something. They need the information on all the opportunities they have. Then they need easy, step by step explanation what they are supposed to do (if they want to use tele-medicine for instance) They need to be informed about the process of e-prescription, like who should get my e-mail… In order to search information for themselves they should be able to use google, what key words should I enter and how do I identify a reliable source. Taking away the fear, that someone will trick them helping them to feel safe Seeking dialogue with the over 65s, taking time to explain the technologies, pointing out the advantages, also the disadvantages, so that the person can then decide Ensure that the costs, e.g. for a wearable, are regulated and covered by long-term care insurers Introducing the technology and spread the information Persuasion, etc., and clear benefits that it will be used. As with any new product Payers and providers should develop a wearable with an app that cannot be manipulated, updates automatically, and makes information accessible to different groups. Information about changes, like a fall, increased blood pressure etc. and this

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immediately available for the medical professional. But also the doctors share for example any change in the medication.

This means, for example, that if he were to go to the hospital, they could immediately read out this data. He gets such and such medication, he has this. And the problem is that he might be a diabetes patient or allergic to this or that medication.

So like the electronic patient file. Right. But that the person carries that on their wrist. So, that the relatives don´t have to look for the documents or the card somewhere. In my opinion, such a bracelet should also have something like a living will on it, which also means digital.

M23062022A – I think it is necessary to develop a basic training for elderly people in DHL. An elderly person with a basic training could save times in his daily routine (contacting the doctor, getting prescriptions, etc.)
S23062022A – Absolutely yes. It can be a great help.
M13062022J – I think that all digital aspects should be developed more.
S23062022J - (same answer of **M23062022A**)

Results:

1-2-3:

- It is needed awareness and education initiatives and training sessions that will educate and motivate older people to acquire some basic knowledge on digital health literacy, and by doing so to improve their quality of life, but also the quality of life of their caregivers.
- It is also needed a constant update of the development of health technologies, on their new abilities to serve older people, and on the new functions that older people might use on their benefit

4: Better education and the approval form the my personal doctor

When participants are asked what has to happen to make DHT even more relevant to the everyday lives of people over 65, the answers are as follows:

low-threshold offers

- *"Offers, such as the Internet consultation hour or technology café"* (DE)
- outreach services: *"Actually going to the people"*

Suitable educational offers

- ***"****Then they need easy, step by step explanation what they are supposed to do (if they want to use tele-medicine for instance)"* (DE)
- ***"****In order to search information for themselves they should be able to use google, what key words should I enter and how do I identify a reliable source"* (DE)
- *"I think it is necessary to develop a basic training for elderly people in DHL"*

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(IT).

Successful communication

- *"Unbiased people who give neutral advise"* (DE)
- *"Taking away the fear"* (DE)
- *"It is also needed a constant update of the development of health technologies, on their new abilities to serve older people"* (IT)

Secured funding

- *"Ensure that the costs, e.g. for a wearable, are regulated and covered by long-term care insurers"* (DE)

Technological advancement:

- *"Payers and providers should develop a wearable with an app that cannot be manipulated, updates automatically, and makes information accessible to different groups"* (DE).

As far as the individual factors are concerned, it is particularly clear that the focus here is on basic/low-threshold services.

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26. What do you think is the reason why people over 65 might not use digital health technologies?
Maybe it is difficult to know whether there is interest or not They are afraid to touch anything in the internet, in case they make a mistake, like opening a file and everyone can see that or to click on something and accidentally buy things. Some don´t like changes, they prefer things to stay the same. They don´t want anything new. They are overwhelmed by the options and afraid to make a mistake, like to agree or disagree with the cookies is difficult and if they do not know what to do they just stop trying
M23062022A – I don't think there are particular motivations for which the elderly could not use DHT. Some of them might have sensory difficulties. **S23062022A –** I noticed that some elderly people do not appreciate certain type of technologies. I have noticed that some of them still prefer a face-to-face contact with the doctor **M13062022J –** The technological tools are often considered a disturbing element and some of the elderly people are not interested in learning how to use them. **S23062022J -** Because they have never used these tools. Moreover, we must consider that a 65-year-old person is certainly a little more independent than an older one.
Results: 1-2-3-4: - Lack of awareness on the meaning, tools and benefits of digital health literacy - Lack of familiarization of older people to digital technologies - Lack of digital literacy for a big part of people in third age - Lack of willingness to learn things about new technologies
The following are possible reasons why people over 65 do not use DHT: **Lack of familiarization of older people to digital technologies** ▪ *"Because they have never used these tools. Moreover, we must consider that a 65-year-old person is certainly a little more independent than an older one"* (IT). **Lack of willingness to learn things about new technologies** ▪ *"Some don´t like changes, they prefer things to stay the same"* (DE) ▪ *"I noticed that some elderly people do not appreciate certain type of technologies. I have noticed that some of them still prefer a face-to-face*

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contact with the doctor" (IT).

Fear of making mistakes

- *"They are afraid to touch anything in the internet, in case they make a mistake"* (DE)

Furthermore, the following are cited (GR):

- Lack of awareness on the meaning, tools and benefits of digital health literacy
- Lack of digital literacy for a big part of people in third age

Physical limitations

In addition, one interviewee expresses

"I don't think there are particular motivations for which the elderly could not use DHT. Some of them might have sensory difficulties" (IT).

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27. What would help people over 65 to increase their skills in using digital health technologies? What stands in the way?
That you help them personally. That you show them personally how it works and how you can work with it. Not just showing them how to do it, but really working with them that they have to do it themselves. A course like this is actually the best thing you can do. Where you sit there with several older people who all have no idea about all this stuff and everyone is a bit afraid of it, so they take away each other's fear. And when you work together, laugh together, that's how we did it in the course and it worked really well. Very easy operation must be there, of course. Large, large fonts for people who no longer see well. And good audio so also for listening. Apps in this area are definitely more suitable for a tablet than for a smartphone then. We use a tablet where people can play different games on there, counting money, looking at different landscape pictures, quizzes, instruments, who plays the instrument and so on. And it's very well received, and as you move into the digital realm, the more you venture, you can put more and more puzzle pieces together of different things Barriers: if you don't have good fine motor skills now, for example, or dementia Many people are afraid. And it's hard to take that away. Due to non-understanding of the device, no opportunity to use the device in the home because of no wifi connection. Some are not so tech-savvy and not so Internet-oriented that an own activity/interest arises from it there are huge reservations against any kind of offer that would change their life or lifestyle
M23062022A - Someone who gives them clear explanations on how to use properly the DHT. **S23062022A –** (The same answer of **M23062022A)** **M13062022J –** Constant and concrete help is essential to learn effectively. Maybe, the conditions related to aging are the main obstacles when an elderly person tries to approach the DHT. **S23062022J -** I can suggest a shift from manual activities to Digital ones for the Elderly. I do not find any difficulties in it.
Results: 1-2-3-4: - A customized education framework based on older people health issues

- Well structured and user-friendly applications and tools so for older people to be able to read the information and apply it in collaboration with the caregiver or the health staff

4:

- The use of practical examples

According to the interviewees, the following things could help people over 65 to improve their ability to use DHT:

Personal accompaniment

- *"That you help them personally"* (DE)
- *"Constant and concrete help is essential to learn effectively"* (IT)

Social embedding

- *"And when you work together, laugh together, that's how we did it in the course and it worked really well"* (DE)
- *" (…) apply it [information from applications and tools] in collaboration with the caregiver or the health staff"* (GR)

Didactic approach

- *"Not just showing them how to do it, but really working with them that they have to do it themselves"* (DE)
- *"The use of practical examples"* (GR)

Technical framework

- *"Large, large fonts for people who no longer see well"* (DE)
- *"And good audio so also for listening"* (DE)
- *"Apps in this area are definitely more suitable for a tablet than for a smartphone then"* (DE)
- *"Well structured and user-friendly applications and tools so for older people to be able to read the information and apply it (…)"* (GR)

Training/level of didactic knowledge

Imagine training people over 65 in the use of digital health technologies…

28. What general conditions would be needed for you to succeed in this?

I need to go through the steps myself first, when I know the scenario I can explain it better and I am more prepared to answer questions and I am aware of each step.

I would go through the scenario of online consultation, tele-medicine. First of all you have to where where to make the appointment, where do find this on the website, how do put in the data, where do I have click… I would go through this process

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myself and then together with the seniors.

One pre-condition is that the person knows how to handle a smartphone or has some basic skill regarding technology.

Or you have to divide between beginner and more advanced. So people without any knowledge can start with the basics about tablets, smartphones and also apps and then later you can specify on healthcare apps.

An idea could be to work with rewards. In another project we created small medals and also other gifts to say thank you or well done! Just to show that we really appreciate their effort.

Fun is also very important, fun in the way you talk and the learning effect will come kind of automatically.

I think in person meetings are better especially in the beginning so the participants can have some exchange. Zoom-Meetings could be the 2nd or 3rd step when they have some experience.

Openness for anything new, skills and competences, understanding for the new things

And the important thing for me is, that everyone really uses it. Regarding the E-file or wristband all healthcare services should use it, so that the data is bundled there. So it's not with the app providers, the 100 different ones, but with the health insurers, who get all the information from us anyway about our illnesses, about our state of care, about the things we need in the form of medication, aids and so on.

So there's also the issue of data protection.

Small groups max. 5 persons; short interventions max 30 minutes. Using a large screen or beamer to show each step. Short, clear, precise explanations, presenting the benefits for their daily life. Also practice with a tablet that has the app installed directly. Take time for each persons questions and let them try out for themselves.

The design of the room is incidental, as long as the focus remains on this triangle: On the one who makes the presentation, the beamer and the good atmosphere among participants. And since the attention is very small, 30 minutes maximum

You have to fit into the generation, always look at each person individually, adjust to their needs and competences then it will be successful.

Bring the technology closer, inform, explain, show personal advantages, benefits best associated with already known examples (emergency call button), establish trust, give security

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M23062022A - A very simple written guide and a mentor teaching me are important.
S23062022A – Quiet and peaceful environments allow you to teach better.
M13062022J – Constant training and refresher courses on the subject.

S23062022J – Mutual understanding and trust between the Caregiver and the Elderly person.

1: Good knowledge upon the application of digital health technologies

2: The existence of a help and guidance function to address whenever needed

3-4: The availability and disposability of the older person. Many times it is difficult for an older person that lives with the burden of a chronic disease to find the time and the right mood to follow such lessons

The following things are mentioned by the direct target group of carers that would be necessary for them to successfully train people over 65 in the use of DHT:

Personal preparation/pre-requisite of the trainer:

- *"I need to go through the steps myself first, when I know the scenario (…of online consultation, tele-medicine) I can explain it better"* (DE)
- *"Good knowledge upon the application of digital health technologies"* (GR)

Prerequisite for people over 65

- *"The availability and disposability of the older person. Many times it is difficult for an older person that lives with the burden of a chronic disease to find the time and the right mood to follow such lessons"* (GR)
- *"pre-condition is that the person knows how to handle a smartphone or has some basic skill regarding technology"* (DE)
- *"Or you have to divide between beginner and more advanced. So people without any knowledge can start with the basics about tablets, smartphones and also apps and then later you can specify on healthcare apps"* (DE)

Didactics/methodology

- *"Take time for each persons questions and let them try out for themselves"* (DE)
- *"You have to fit into the generation, always look at each person individually, adjust to their needs and competences then it will be successful"* (DE)
- *"Bring the technology closer, inform, explain, show personal advantages, benefits best associated with already known examples (emergency call button), establish trust, give security"* (DE)
- *"A very simple written guide and a mentor teaching me are important"* (IT)
- *"Mutual understanding and trust between the Caregiver and the Elderly person"* (IT)

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- "refresher courses" (IT)
- *"An idea could be to work with rewards (…small medals and also other gifts)"* (DE)
- *"I think in person meetings are better especially in the beginning so the participants can have some exchange. Zoom-Meetings could be the 2nd or 3rd step when they have some experience"* (DE)

Technology/social environment

- *"And the important thing for me is, that everyone really uses it [DHT]. Regarding the E-file or wristband all healthcare services should use it, so that the data is bundled there"* (DE)
- *"Small groups max. 5 persons; short interventions max 30 minutes"* (DE)

Together, the above results show that it is not "just a matter of putting an e-learning platform online". Instead, there needs to be appropriate involvement, selection and preparation of both mentors and people over 65.

29. What skills and methods would you like to learn or develop in order to train people over 65 in the use of digital health technologies?
Communication is an important aspect, how do I talk to them? Which words do I use, do they understand these words or not, how do they react I have to be observant so that I realize okay at this point I lost them, they do not follow any more. Then I have to explain again but in a different way. English language skills can be useful to find more content in google or to find it easier/faster You need patience with older people. Some questions will be asked 10 times, like what is this button for etc. so you need to be patient. A training on how to communicate with older people. How to talk with them, look at them, trying to have eye contact, to speak loud, clear, slow. Or if they have bad hearing in one ear to talk to the other side so that they understand.
M23062022A - Someone who explains me how to teach in a simple and clear way. **S23062022A –** (Same answer of **M23062022A**). **M13062022J** – Acquiring experience with DHT and knowledge about the recent developments. **S23062022J -** A specific course should be created. Refresher courses are fundamental for the teachers/mentors.
1: To be able to use simple, easy to use, applicable training material

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2: Better digital literacy skills

3: To learn well the function of the platform, to learn well the current issues on DHL

4: I do not think I am capable of doing this

The mentors would like to further develop the following skills and methods in order to optimally support people over 65:

Communication/interaction with the target group

- *"Communication is an important aspect, how do I talk to them*?" (DE)
- *"Someone who explains me how to teach in a simple and clear way"* (IT)
- *"How to talk with them, look at them, trying to have eye contact, to speak loud, clear, slow"* (DE)
- *"You need patience with older people"* (DE)
- *"To be able to use simple, easy to use, applicable training material"* (GR)

In addition to these aspects, the need *"to learn well the function of the platform, to learn well the current issues on DHL"* (GR), as well as *"acquiring experience with DHT and knowledge about the recent developments"* (IT) were also mentioned.

Furthermore, participants also mention the need to develop *"better digital literacy skills"* (GR) themselves or do not see themselves in a position to take on the tasks of a mentor at all: *"I do not think I am capable of doing this"* (GR).

Reference was also made to English as a technical language in the field of DHT:

"English language skills can be useful to find more content in google or to find it easier/faster" (DE)

30. What exactly would training to become a mentor for digital health technologies look like that would make you want to participate in it?
    a. In general, do you remember a training you attended that was particularly great?
    b. If yes, what did it look like?
    c. Can you describe what impressed you there?

That they find the right words and the right motivation. The change between, "something is told", "something is explained in general" and then talking about experiences to make more personal. I always find that the more personal someone makes a lecture or a training session, the more pleasant it is for me.

Small units and someone who is very enthusiastic helps as well

Sometimes we had to listen, then we had to work on our own, then we were able to ask questions, it was a good group where everyone was listening actively and got

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involved.

A course for learning how to deal with people, so how to deal with really all kinds of patients and residents, because there are various

Maybe you can also show people how to google properly, that you have to search further down, that you have to look in forums,

And explain that other people also have the same problem as you have, so they do not feel alone

Expert or specialist knowledge must definitely be present, must be in there. The app must still be simple, because not all mentors are young and not yet really adapted to the technology or know about it.

I would try both ways in person and digital, so maybe trying hybrid. So people who are have not the technology for online meetings (camera, microphone…) or who just like to talk to people it would be good to have in person meetings.

It would be good to choose a time You could go the digital route and send invitations via Zoom. I would try both. Partly via Zoom invitations, then of course send them to different homes, also for the older generation. But also for people who want to talk to people, on the spot or don't have the technical possibilities, like a camera or something, also definitely offer it on the spot. Preferably during the day, during working hours. And short sessions, well prepared and with enthusiastic people who bring it across

Preferably during the day, during working hours. And short sessions, well prepared and with enthusiastic people who get it across

Excellent guidance and also a small group. You also got a sample smartphone directly to look at it all. It has remained in my memory. Many other training courses, where there were 50 people and one person was talking at the beamer, were not memorable.

Interactivity

Small group, promotes exchange Small breaks between presentations to open up conversations, also about the topic, etc.

M23062022A – The training course should be simple and clear, so you can learn step by step. The language has to be comprehensible. If the course did not have these features, I would not be motivated. Concerning my job situation, I do not know if it could be useful.
S23062022A – For me it is important to acquire a better knowledge about DHT and to practise.
M13062022J – Patience, the attention to the relational aspect and the ability to transfer the knowledge acquired are fundamental.
It must be a well-structured and captivating course. All the courses unite must be

interesting.
S23062022J - I think that the teamwork with nurses is important in order to strengthen the use of DHT. It should be better if it will be a face-to-face course.

Results:

1.2.3:

- Have a clear learning structure and learning objectives
- Receive a good training before – (if we have the time to do it)
- Have a constant support available

2: In case I can acquire a certification and do it as an occupation

4: I am not interested nor I have the ability to be a mentor

Summary:

In the view of the interview partners, a successful online training for mentors would be designed as follows:

Structure and content

- *"Small units"* (DE)
- *"Preferably during the day, during working hours"* (DE)
- Good practice: *"Sometimes we had to listen, then we had to work on our own, then we were able to ask questions"* (DE)
- *"Have a clear learning structure and learning objectives"* (GR)
- *"acquire a better knowledge about DHT and to practice"* (IT)
- *"Expert or specialist knowledge must definitely be present, must be in there"* (DE).
- *"A course for learning how to deal with people, so how to deal with really all kinds of patients and residents, because there are various"* (DE)
- *"Maybe you can also show people how to google properly, that you have to search further down, that you have to look in forums"* (DE)
- *"The language has to be comprehensible"* (IT)
- *"ability to transfer the knowledge acquired"* (IT)

Place/type of presentation

- *"Partly via Zoom invitations, then of course send them to different homes, also for the older generation. But also for people who want to talk to people, on the spot or don't have the technical possibilities, like a camera (…)"* (DE)
- *"would try both ways in person and digital, so maybe trying hybrid"* (DE=
- *"face-to-face course"* (IT)
- *"the more personal someone makes a lecture or a training session, the more pleasant it is for me"* (DE)
- *"(…) someone who is very enthusiastic helps as well"* (DE)
- *"Have a constant support available"* (GR)
- *"The training course should be simple and clear, so you can learn step by*

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step" (IT)
- *"And explain that other people also have the same problem as you have, so they do not feel alone"* (DE)

31. The DigiHall-project will develop an e-learning platform. Do you already have experience with this kind of learning environment? If yes, please describe your experience.
    a. Do you remember an e-learning training you attended that was particularly great?
    b. If yes, what did it look like?
    c. Can you describe what impressed you there?

Usually it has a lot to do with what your group is like and how motivated they are, because just leaving the camera on can be an issue.

Online, it really needs a topic where I absolutely want to learn about it.

I like animations and small games, working with rewards in one app you received a flower and if you answered correct the plant was growing and blooming the higher you went/with each leven, things like that are quite nice and release dopamine

A nice design, nice colours, a good structure

It might be helpful to secure the tablet, to change the seetings in such a way that they are not able to do everything, in order to give more security.

Being patient, to listen and let the other finish the sentence and then explain calmly

No advertisement, a certain professionalism in programming

You notice that quickly, for example, none of those square edges, 2000s style, that time is over. In the new programming, everything is a bit technology 4.0, so to speak. I also like a nice design in a way, that also entices you to open the app. A simple operation. And e.g. also important is a password storage at the beginning. Not that every time you log in, you have to enter a lot every time you log in to the app. Then people don't feel like it, because I don't either. And then I don't open that app anymore. If all this is given and the subject area is interesting and well implemented, I'm willing to spend money on it.

M23062022A - I attended an interesting course. It was captivating because there was a beautiful theoretical part (one of the subject was psychology). From a relational point of view, I liked to meet other students and teachers.
S23062022A – We attended different face-to-face courses. A face-to-face course is more detailed, in my opinion. But, if there were not the conditions for a face-to-face course, it would be ok an online one.
M13062022J – I remember with pleasure some face-to-face meetings: I liked the

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interaction between the participants and the possibility to express yourself.
S23062022J - I liked very much the OSS course I attended because it had detailed topics, such as IT subjects.
During the course, I discovered that also the subjects considering relational aspects are fundamental.

Results:

1. I remember the training for my Master degree. Almost the whole training was through distant learning, and what I liked most was the opportunity I had to study when I was available, and the direct connection I had with the supervisor and the other learners

2: In my case I also have participated in some distant learning courses, and I prefer them in comparison to face to face learning sessions. What I liked most was the variety of the applications of the training material which make the learning much enjoyable and more experiential.

3: I also have participated in distant learning course. At the beginning I had to be educated and get accustomed to the learning platform (MOOC). It was very helpful in terms of time management, but for me the most important feature was the ability to follow the class at my own rhythm.

4: I have not participated in distant learning courses.

With regard to an e-learning platform, the participants have already had the following experiences:

- *"(…) what I liked most was the opportunity I had to study when I was available, and the direct connection I had with the supervisor and the other learners"* (GR)
- *"(…) What I liked most was the variety of the applications of the training material which make the learning much enjoyable and more experiential"* (GR)
- *"(…) At the beginning I had to be educated and get accustomed to the learning platform (MOOC)"* (GR)

Structure and content

- *"A nice design, nice colours, a good structure"* (DE)
- *"No advertisement, a certain professionalism in programming"* (DE)
- *"I also like a nice design in a way, that also entices you to open the app. A simple operation. And e.g. also important is a password storage at the beginning. Not that every time you log in, you have to enter a lot every time you log in to the app. Then people don't feel like it, because I don't either. And then I don't open that app anymore"* (DE)
- *"I like animations and small games, working with rewards in one app you received a flower and if you answered correct the plant"* (DE)

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Place/type of presentation

- *"A face-to-face course is more detailed, in my opinion. But, if there were not the conditions for a face-to-face course, it would be ok an online one"* (IT).
- *"Online, it really needs a topic where I absolutely want to learn about it"* (DE)
- *"In my case I also have participated in some distant learning courses, and I prefer them in comparison to face to face learning sessions"* (GR)

Social embedding

- *"I remember with pleasure some face-to-face meetings: I liked the interaction between the participants and the possibility to express yourself"* (IT).

Technology

- *"It might be helpful to secure the tablet, to change the seetings in such a way that they are not able to do everything, in order to give more security"* (DE)

Review

32. Looking back on the course of our conversation, is there anything else you think we should know or consider with regard to this goal?
Variety is always good, the less text the better. I hate reading texts, so I personally am rather visual and audio You need open people; you need to make sure that they are people who speak clearly, loudly and kindly enough to people Organize meetings for the mentors so they can have an exchange Address the relatives more actively and offer more information, provide more knowledge Reflect everyday life, in videos show not only young, slim, athletic people. And my idea would also be, with regard to all these aids, that there is also a clear examination by experts and that you have digital pages where it is precisely listed: There is this, this and this. Tips and information on different aspects of care The site would have to be well structured. It would have to be fully comprehensive. I have this problem and I have to consider this and that. It should be low-threshold and easy to understand. And I have understood videos are also quite helpful, then, of

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course, a video helps because it also ultimately bypasses language barriers. You can also watch it several times and not only once, I can lay the tablet or smartphone next to me and watch the video to follow the explanation.

M23062022A - I do not know.

S23062022A – I do not have anything to add.

M13062022J – Nothing to add.
S23062022J - I do not know.

Results:

1. You should definitely consider the particular abilities and learning needs of the people who will be participating in the training as well as ways to make the learning platform more user-friendly to achieve the learning objective

1-2-3-4: Digital health technologies should work upon the autonomy and quality of life of older people, doing so in a simple and easy to use way.

Selection of mentors and didactics

- *"You need open people; you need to make sure that they are people who speak clearly, loudly and kindly enough to people"* (DE)
- *"You should definitely consider the particular abilities and learning needs of the people who will be participating in the training"* (GR)

Social embedding

- *"Organize meetings for the mentors so they can have an exchange"* (DE)
- *"Address the relatives more actively and offer more information, provide more knowledge"* (DE)

Content

- *"And my idea would also be, with regard to all these aids, that there is also a clear examination by experts and that you have digital pages where it is precisely listed: There is this, this and this"* (DE)

Type of presentation

- *"a video helps because it also ultimately bypasses language barriers. You can also watch it several times and not only once, I can lay the tablet or smartphone next to me and watch the video to follow the explanation"* (DE)
- *"Variety is always good, the less text the better. I hate reading texts, so I personally am rather visual and audio"* (DE)
- *"Reflect everyday life, in videos show not only young, slim, athletic people"* (DE)

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33. Additional question for evaluation (was not included in the interview guide): Did you, as the evaluator of the interviews, have any other findings from the interviews that have not been mentioned so far and that are important/ relevant for the further implementation of the project?
Results: Empty for Greece, Italy and Germany

Indirect target group (people in third age)

Perspective I indirect target group: status/experience

1. Describe if and where you have gained professional or private experience with digital health technologies.
Digital health technologies aren´t that known. Some have heard of it, but mostly haven´t used any. Experience with digital health technologies: - No experiences (in 3/3 interviews). Experience with digital technologies: - None: “Just the newspaper.” (in 1/3 interview). - Basic knowledge: mobile Phone, computer (in 2/3 interviews). - Usage of smartphones (in 2/3 interviews). - Wearables (smart-watch) or health App (in 2/3 interviews). Usage: - Usage of an Health-App after surgery (in 1/3 interviews). - Only information about health is looked up on the internet (in 2/3 interviews).
G01072022J: I often need help with the PC; but, only when it stops responding and I cannot manage to unlock it. I am autodidactic. My daughter gave me a mobile phone and a PC and I had to manage to use them. F01072022J: I often need help with the mobile phone, when it stops responding and I cannot manage to unlock it. I am autodidactic. I learnt to use it by myself. G07072022J: I do everything by myself; no one taught me how to use them. They (he/she refers to doctors, etc.) indicated me to use these technologies in order to download the blood tests. They told me: “you have to do in this way, there is a code,

a password, and you can download them". It occured the same situation with the electrocardiogram. I book the medicaments, but I learnt everything by myself.

Results:

1-2-3 : (empty)

Kernaussage/"Code"/Kategorie (Needs!): mit Kerninhalten belegen..

Summary:

The first question was about the amount of experience people in third age have gained digital health technologies in a private or professional context. Most of the inter partners from Germany, Italy and Greece didn't have extensive knowledge or experi with digital health technologies. Some common applications or technologies like m phones, sometimes even smartphones and computers are known, but not their capacity. For the most part, respondents were already retired when technology introduced into their daily work lives. In some cases, the level of experience is heterogenous. One of the interview partners showed more advanced experience:

"I do everything by myself; no one taught me how to use them. They (he/she refe doctors, etc.) indicated me to use these technologies in order to download the blood t They told me: 'you have to do in this way, there is a code, a password, and you download them'. It occurred the same situation with the electrocardiogram. I book medicaments, but I learnt everything by myself" (IT).

Another partner, on the other hand, showed no experience at all and told us that:

"Only newspapers!"(DE).

Where the type of media that would be used.

2. Which digital offers, technologies and information are you aware of?
   - Which of these do you use yourself?
   - How often do you use those things?
   - What is the main motivation/goal you want to achieve by using digital health technologies?
   - Do you/did you use information to make concrete decisions about your own

health behaviour? If yes, what was the decision/behavior? o Are you interested in specific topics or technologies?
Awareness of digital technologies: - Basic: a mobile phone, the television, the computer (in 1/3 interview). - Smartphone, wearables, apps, tablets (in 2/3 interviews). Usage: - From never to more than once a week. Goal of using digital technologies: - Information from the internet / television has been used to change eating habits and to look up a healthy way of living (in 2/3 interviews). - Also, the internet has been used to search information about a medical problem or health complains (in 2/3 interviews). Health behaviour: - Usage of an health-app after surgery (how much to move, when to take medication, how to prepare for surgery) (in 1/3 interviews).
G01072022J: Actually, I know little about these technologies. I use the mobile phone especially for calling the doctor, sending messages and booking specialist visits. I use them on a monthly basis, but it depends a lot on my physical condition. I would like to keep my health under control. I do not use these technologies or information to make concrete decisions about my health choices. I always talk with the doctor first. I am not interested in specific topics or technologies because I think I am not able to understand them. F01072022J: I often use the mobile phone to look up diseases or to contact the doctor. I use the mobile phone especially. I use it every day. I would like to seek medical information and to keep my health under control. I used this type of information, but I always consulted the doctor before making decisions on information found on the Internet. I am not particularly interested in specific technologies or topics. I feel good with the mobile phone. G07072022J: I know the electronic prescription and this strange device which measures different things and which is connected to the mobile phone. And I know

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the electrocardiogram (which I had never seen so innovative). I would like to take my health under control, but the doctors told me that it might become a “mania” (for example with the blood pressure monitor, or with the glucometer). Then, a person becomes obsessed and is taken ill. I would like to take my health under control in a moderate way, but not excessively. You have to follow the doctor’s instructions. In fact, my blood pressure monitor is there (since I saw that a little red heart was beating during the measurement –they told me that it indicates decompensation- I left it aside). Sometimes I search information on medical websites; for example, I search what is contained within a medicine. I do not pass all my day on these websites. There is a website which I consider valid because it gives me simple and clear answers (I think these answers are quite truthful). I am interested in health topics.

Which digital offers, technologies and information are you aware of?

1-2: None. I am not aware of health technologies, apart from smartwatches that I have seen my kids to wear

3: E-prescriptions

- Which of these do you use yourself?

  1-2-3: Smartphone and tablet

- How often do you use those things?

  1-2-3: Everyday or almost everyday

- What is the main motivation/goal you want to achieve by using digital health technologies?

  1-2-3: There is a need to make the best to monitor our health and preserve the biggest possible level of autonomy. Also having more direct interaction with doctor or the central health services will upgrade our quality of life in terms of saving valuable time and personal resources

  Do you/did you use information to make concrete decisions about your own health behavior? If yes, what was the decision/behavior?

  1-2: No

  3: So far I have used the information received from internet or some simple messages form my doctor to arrange some of my medical tasks.

- Are you interested in specific topics or technologies?

  1-2-3: Not specifically

Summary:

The main focus in usage of digital technology is in gathering health related informati
hasn’t been used by the respondents a lot for maintaining health so far. Mostly h

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information has been gathered on the internet via a computer or mobile phone.

"I often use the mobile phone to look up diseases or to contact the doctor. I use the m phone especially. I use it every day. I would like to seek medical information and to kee health under control. I used this type of information, but I always consulted the d before making decisions on information found on the Internet. I am not particu interested in specific technologies or topics. I feel good with the mobile phone" (IT).

Specific digital health technologies aren´t that known. Some respondents l smartwatches or the possibility to get an e-prescription, but don´t have a lot of experien Just in one interview a respondent used an app to get ready for a surgery. It was presc by a doctor and seemed to be helpful at the moment (DE).

Perspective II indirect target group: development opportunities, chances, obstacles

3. What exactly do you think are the advantages for you personally in using digital health technologies in your everyday work and life?
- None, "because I am too old for that" (in 1/3 interviews) - In everyday life: To look up information about the own health whenever needed (in 2/3 interviews). - "It allows to be prepared for doctor´s appointments" (in 2/3 interviews). - It helps to help yourself and to be more self-reliant (in 1/3 interviews).
G01072022J: Using digital health technologies in my everyday work and life improves my general health condition and I can take under control all the visits I booked. F01072022J: Information on diseases and on one's own health condition can help to keep under control and to prevent serious illness and diseases. G07072022J: Using digital health technologies in my everyday work and life helps me to remain healthy.
1-2-3: We can have more information regarding the course of our health, and we can arrange better our daily living in relation with the doctor's guidelines. We anticipate a feeling of a more concrete management of our health based on the use of digital technology tools and applications in the future. 3: I also used the e-prescription through my smartphone, which was very helpful.

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After my visit to my doctor, I had the chance to go to the pharmacy, show the prescription and receive my medication while the prescription was immediately registered into the system

Summary:

Although respondents do see a lot of opportunities in the usage of digital h technologies the answers go from "*none*" *(DE)* to "*using digital health technologies i everyday work and life improves my general health condition and I can take under cc all the visits I booked" (IT).*

The main response is that digital health technologies is helpful in terms to know more a the own health and health issues. The fact to be informed and to know what to do has seen as the main chance and opportunity.

"We can have more information regarding the course of our health, and we can arr better our daily living in relation with the doctor's guidelines. We anticipate a feeling more concrete management of our health based on the use of digital technology tools applications in the future" (GR).

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4. In which areas/in which tasks of your life could digital health technologies also be helpful?

- To get information and knowledge in general (in 2/3 interviews).
- Having a doctor´s appointment via telemedicine (advantage in times of the pandemic) (in 2/3 interviews).
- To track the own fitness (in 2/3 interviews).
- Apps to prevent dementia (in 1/3 interview).

G01072022J: There are no other situations in addition to those already described.

F01072022J: There are no particular situations/tasks in which technologies could help me.

G07072022J: (see answer n.2)

1-2-3:

A) In our daily living regarding the continuously updated knowledge of what we can or we are allowed to do

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B) In our communication with our personal doctor
Summary: Most answers were about communication with medical staff or information gathe But also to track the own fitness (DE). Also in terms of communication with the doctor. *"In our daily living regarding the continuously updated knowledge of what we can or we are allowed to do" (GR).*

5. What conditions would have to be in place for you to use more digital health technologies in your daily life?
- It must be easy to use (in 3/3 interviews). - Someone has to explain it to me / there is a person needed, who´s explaining and showing the usage of the digital health technology (in 2/3 interviews). - It should not be far away from home (in 2/3 interviews). - There is the need for constant help and guidance (not just one hour of learning class) (in 2/3 interviews). - I would need someone that I can always ask if I have a problem (in 1/3 interviews).
G01072022J: I do not think there are particular situations. Now I am old and I do not think I will use them better than now. F01072022J: I am not able to answer to this question. G07072022J: The conditions are related to ease of use and truthfulness (for example, there are some webpages which start talking about health and then pass to bitcoins). I close immediately this type of webpages.
1-2-3: More information on: - The digital health tools and applications - How these tools and applications can match our needs - Who has access to our data - Whether these application will prove to be cost effective for us

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Summary:

On the one hand: "*I do not think there are particular situations. Now I am old and not think I will use them better than now"* (IT).

On the other hand, most rated conditions were:

- It has to be easy to use.
- There must be somebody who is there to show how it works.
- The tools have to match the individual needs.
- The price shouldn´t be too high.

6. What prevents you from using digital health technologies?
- Some technologies are very small, so that it is hard to read texts (in 2/3 interviews). - Fear of data leaks or telephone fraud (in 1/3 interviews). - I don´t know what I can use for what (in 1/3 interviews). - The technology is too expensive and I don´t need it (in 1/3 interviews).
G01072022J: Becoming older, you lose your memory for new things. F01072022J: I know little about new technologies. G07072022J: (see answer n.8) The vocabulary used may prevent me from using digital health technologies because English is used for everything (also in health terminology). I must know this new vocabulary, which is neither English, because it is often Italianized.
1-2-3: - Lack of awareness on these issues and of relevant information 2: I need to see it first working, to see it being used in massive scale 3: I have no particular inclination in learning technology and technological applications 1: I am thinking about the possibility of mistakes by the technology that can prove to be crucial for my health

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Summary:

Digital texts are often small and hard to read or too complicated for elderly people. there is fear of data leaks or fraud.

"I am thinking about the possibility of mistakes by the technology that can prove t crucial for my health" (GR).

"The vocabulary used may prevent me from using digital health technologies bec English is used for everything (also in health terminology). I must know this new vocabu which is neither English, because it is often Italianized" (IT).

Perspective: Learning

7. What was your first approach towards the usage of digital technologies concerning your health?

- A medical issue (surgery, health complaints) (in 2/3 interviews).
- None (in 1/3 interviews).

G01072022J: I booked a specialist visit by phoning with my mobile phone.

F01072022J: In the past, I was really sick and I had to approach digital health technologies.

G07072022J: (See answer n.1)

1: I am not fond of it, and I am not fond of being constantly under surveillance

1-2-3:

- We need to know that there is a safe system that guarantees our data will be directed safely and correctly to the doctor, and the feedback received will safely reach to us

3: Would that end up to fewer visits for health examinations and actions?

Summary:

Most given answer is the approach caused by a medical issue, a surgery or other h problems.

"*In the past, I was really sick and I had to approach digital health technologies"* (IT).

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8. What would help you and people over 65 in general to increase their skills in using digital health technologies?
    a. What skills would you like to improve?
    b. What stands in the way?

- Not knowing which technologies do exist, how they are working and what potential they have (in 2/3 interviews).
- I don´t need it (in 1/3 interviews).

G01072022J: It is essential a simple and direct way of explaining things, step by step and with calm. At the moment, I would not improve any skill in using digital health technologies. Now I am old and I tend to forget things.

F01072022J: It could help to practice a lot and not to give up at the first difficulty; otherwise, a person tends to forget things. At the moment, I would not improve any skill. I am too old to learn new things.

G07072022J: I think some quick-courses could help. I would like to find Italian terms, because English is used for everything. It is important that the language is comprehensible also for the elderly. I often need to look words up in a dictionary. For me, it might be an obstacle the fact that I do not know this kind of vocabulary, which many times consists of English/Italianized terms.

What would help you and people over 65 in general to increase their skills in using digital health technologies?

c. What skills would you like to improve?

1-2-3: It is needed an educational program which should be customized on the specific needs and requirements of each participant-learner, as the most important motivation for people in our age is to connect this new tools with the certainty that will improve our health, living conditions and quality of life

What stands in the way?

1-2-3: No willingness to start learning again, especially when it comes to complex or demanding subjects as it is digital health technologies

Summary:

Some do not need it at all. Others would like quick-courses and more practice in everyday life.

I think some quick-courses could help. I would like to find Italian terms, because Engl
used for everything. It is important that the language is comprehensible also for the el

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I often need to look words up in a dictionary. For me, it might be an obstacle the fact i do not know this kind of vocabulary, which many times consists of English/Italianized te (IT).

9. Which device do you prefer to use (tablet, mobile, desktop pc)?
- Just the mobile phone (in 1/3 interview). - Computer, smartphone, or wearables. But mostly the computer, because it is easier to read texts on the big screen (in 2/3 interviews).
G01072022J: Always the mobile phone. F01072022J: I prefer the mobile phone. G07072022J: I prefer the PC, because it is large (for the screen's and keys' dimension). It is easy to bring the tablet with me (I bring with me also the notebook, I put it in a bag).
1-2-3: Smartphone, despite the fact that many times the display is not adjusted for people in 3rd age (small letters, small buttons)
Summary: Most given answer is the mobile phone or the computer because it is easier to use. "*I prefer the PC, because it is large (for the screen's and keys' dimension). It is ea bring the tablet with me (I bring with me also the notebook, I put it in a bag"* (IT). Some also use a smartphone or wearables.

10. What is important to you with regard to the handling of your technological devices?
- It has to be reliable (2/3 interviews). - Easy usage (in 3/3 interviews). - The touch screen is difficult to use, sometimes (in 1/3 interview).
G01072022J: It is manageable and I always have it to hand.

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F01072022J: I can put it in my bag and it is manageable and easy to use.

G07072022J: It is important the practicality; the PC has the advantage to be large (keys, screen). The tablet is manageable. It is important that there is a free WIFI zone where I go.

1-2-3: To be easy to handle

Summary:

It has to be easy to use and there must be somebody who is there to show how it works. The tools have to match the individual needs and it should be affordable

Perspective: Training/level of didactic knowledge

Imagine a mentor will teach you and others over 65 in the use of digital health technologies…

11. What general conditions would be needed to succeed in this?

- It must be in person (in 3/3 interviews).
- The mentor would have to be honest and not having a commercial interest in just selling a product (in 1/3 interview).
- A course would be good. It should not be too far away from home (in 2/3 interviews).
- Individual problems with technology should be solved first (in 2/3 interviews).
- The course should be repeated regularly (in 2/3 interviews).
- The mentor should use a simple language and be patient (in 1/3 interview).

G01072022J: He/she should always be available to come to my home in order to give me the explanations.

F01072022J: There are no particular conditions. A help is always appreciated.

G07072022J: He/she should have expertise and patience.

Results: (question 11-15 are empty)

Summary:

The training needs to be in person – and the person who is teaching needs to be pa and speak in an understandable way.

“He/she should always be available to come to my home in order to give me

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explanations" (IT).

12. How can a mentor support you in using digital health technologies?
- In showing the technology and the way of using it (in 3/3 interviews).
G01072022J: The guide should be patient and should give me explanations calmly. F01072022J: The guide should have patience, give me explanations calmly and let me practice. G07072022J: The mentors should be expert and patient.
Summary: The mentor should be patient and teach the way of using digital health technology ste step. The responds weren´t very specific from each country. Interview partners from Gr did not give any answer.

13. What skills and methods do you think are necessary in order to train you and other people over 65 in the use of digital health technologies?
- Patience, simple language, being open towards other people (in 2/3 interviews). - Mixed methods: frontal instruction, teamwork or working in smaller groups (in 1/3 interview).
G01072022J: I am not able to answer to this question. F01072022J: I cannot answer to this question. G07072022J: They should know how to use the computer programs.
Summary: A lot of respondents did not give an answer to this question. Patience, a simple lang and teaching in small groups were considered as helpful.

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Review

14. Looking back on the course of our conversation, is there anything else you think we should know or consider with regard to this goal?
- Idea: there could be a test in which you can prove your ability to use digital technology and also see what you are missing.
G01072022J: No. F01072022J: No. G07072022J: I think you should consider the user friendliness because for the elderly it is important. Also the platform for the caregivers should be easy to understand and to explain.
Summary: One idea mentioned was: *"There could be a test in which you can prove your ability to use digital technology and see what you are missing"* (DE).

15. Additional question for evaluation (was not included in the interview guide): Did you, as the evaluator of the interviews, have any other findings from the interviews that have not been mentioned so far and that are important/ relevant for the further implementation of the project?
The setting of the different people seems to be very important: how much help do they have in their everyday life, do they live at home and how good is the internet connection, how close are they with their children etc. It seems like the setting is quite important weather they are using digital technology or not.
Results: (empty)
Summary: The setting of the different people seems to be very important: how much help do they in their everyday life, do they live at home and how good is the internet connection, close are they with their children etc. It seems like the setting is quite important we they are using digital technology or not.

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DHL-Experts

Status/experience

18. Describe in what way you have contact with people over 65 in your professional or private everyday life, e.g. also in an honorary capacity.
▪ **Private** contact with: ..own parents ..own grandparents ..aunt, relatives ..own voluntary work ▪ **Professional:** ○ Within the framework of projects carried out: Acquisition & testing of different technologies ○ Advising organisations that work for seniors ○ At events for and with seniors who are volunteers
D07072022J: Especially by phone or via WhatsApp. **S04072022J:** I am an angiologist and I am always in contact with people over 65. **M27062022J:** In my professional life I am in contact with patients with congenital heart diseases. In addition, I belong to a local service club where there are several people over 65.
1. I work for an organization that has daily support programs for people over 65 with neurocognitive deficits 2. I work in an organization for older people with MCI or dementia, and I also am doing consulting sessions with care givers of older people 3. I am a social worker visiting older people at their home for social services
Summary: It depends on the professional context: Many have contact with their relatives. Parents and grandparents. Others work with the elderly for social services. Summarized, it is private or professional contact. *"I work in an organization for older people with MCI or dementia, and I also am doing consulting sessions with care givers of older people"* (GR).

19. Describe where you have gained professional or private experience with digital health technologies.

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Private:

Basic/Internet:

- Information on artificial hip, look up technical terms before visiting doctor with own parents.

M-Health:

- Smartwatch/I-Watch (incl. health apps, e.g. measure ECG, take pulse, count steps). Also for cycling: Count kilometres, network with scales, blood pressure monitor, etc. Upload to platform and share with others).
- Communication via app with own health insurance

E-health:

Not explicitly mentioned

Professional:

- Develop demonstrator or prototype
- Contact with health insurance companies regarding health applications
- Contribution to the training of health ambassadors

D07072022J: I have experience with applied technologies for disability health. An ALS patient who used software to communicate with medical staff.

S04072022J: I was a researcher at CNR (Consiglio Nazionale delle Ricerche), my field of study was telemedicine.

M27062022J: I have been interested in telemedicine for years. I started with a Teleconsultation project, a diagnostic support for hospitals outside the Marche region.

1. As part of my work experience, I have participated in research projects related to the application of assisted living and information communication technologies in the field of health

2. Through my expertise as a psychologist dealing with people with the Third Age, I had to search for information on digital health technologies on my own, but I have also been trained by my organization in cases of immaterial prescriptions, training in digital media for the elderly, etc. I have also worked in programs that used new technologies in the 3rd age group

3. Up to now I have participated in many European research projects around the introduction of assisted living and ICT into the daily lives of older people

Summary:

The usual technologies like the internet, smartphones, wearables etc. are used for health matters. In a professional context the respondents have a lot of experience with very specific digital health technologies like telemedicine, communication tools in a medical field, European research projects or contribution to the training of health ambassadors.

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"I have been interested in telemedicine for years. I started with a Teleconsultation project, a diagnostic support for hospitals outside the Marche region" (IT).

20. From experience in the past and present: What are the main topics/developments regarding digital health technologies and people over 65?
▪ **Legal requirements** for the compulsory digitalisation of actors in the health sector ▪ **Social participation** as a very important aspect for older people (there are more and more older people who live alone), this also includes digital sovereignty, some social discussions only take place via social media. ▪ **Media competence** will also play a major role in the future in accompanying older people on their way to the internet. ▪ **Apps** (incl. digital care applications [DiPA] and digital health applications [DiGAs]), which are included in the catalogue of services.) ▪ **Networking** of stakeholders via digital health technologies (e.g. regarding disease progression/medication) ▪ **The digital health record**, coordinated procedure/identical knowledge of treating physicians. ▪ **Automatic collection of health data** (e.g. on cardiac arrhythmias, chips for blood glucose measurement) without explicit "logging in" by the user. ▪ **"Early warning systems"** through the use of automatically collected data ▪ **Safety** of people with dementia, moving towards chips, tracking and also the digital patient or health record ▪ **Relief for carers**, including relatives, through technical support ▪ **"Hybrid offers":** e.g. gymnastics course/REHA course both digital and on-site, e.g. physiotherapy ▪ **Cost advantages** through scaling of digital health applications (software only needs to be produced once, duplication is very easy)
D07072022J: For example, blood glucose monitoring in patients with diabetes is a very important telemedicine application that is developing fast in our area. For the over-65s, the monitoring of vital parameters through smart-watches and other devices is very important. In addition, having a device that allows one to contact a family member is also very important. **S04072022J:** The main developments are the possibility of interacting with the over-65s (for medical examinations) while not being physically in the same place. **M27062022J:** Today we have everything we need to make a qualitative leap in the care of people over 65. As part of the project I mentioned above, we managed to bring an echocardiograph to a small village and carried out a population screening and sent the data live to the hospital in Ancona for analysis.
1-2-3 - Digital technologies are more accessible than before for older people and they are better aware of and more familiar with applications that may help them in their daily health monitoring.

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- Digital health technologies have entered the lives of people in third Age and they themselves recognize that they can make their daily lives easier. Also digital health technologies help them feel safer with tools as it is smartwatches etc.

- People over the age of 65 are largely not familiar with digital health technologies and consider only a visit to the specialist to be acceptable. In order for this to change it is needed an awareness and information campaign based on customized training and education material that can persuade and motivate older people, offering them tangible benefits and solutions to their health problems.

- There is a certain scepticism regarding the provision and elaboration of a person's personal data, and also regarding the trust that these systems may safely help care receivers. This is mainly connected with the level of knowledge of care receivers on DHT and ICT systems, the least is the knowledge and awareness the biggest the reluctance for the care receivers to adapt these systems.

Summary:

Improving the ability of the own health and illness management and monitoring via apps, telemedicine, data management and digital social participation.

"*Social participation as a very important aspect for older people (there are more and more older people who live alone), this also includes digital sovereignty, some social discussions only take place via social media"* (DE).

Especially elderly people benefit from digital health technologies because it allows them to get information or help without deplacement.

"*People over the age of 65 are largely not familiar with digital health technologies and consider only a visit to the specialist to be acceptable. In order for this to change it is needed an awareness and information campaign based on customized training and education material that can persuade and motivate older people, offering them tangible benefits and solutions to their health problems*" (GR).

Perspective on people over 65

When you think of older people over 65 with whom you have contact…

21. What opportunities and benefits do you see for them in using digital health technologies?

- **Avoidance of treatment** errors/polypharmacy through shared access to a document or cloud by the treating physicians.
- **Reduction of hospital admissions**
- Possibility to **influence one's own health** more (and to get more responsibility in one's own hands)
- **Lower entry threshold**, e.g. to take part in a health course, if this can also be done digitally from home.
- **Lower waiting times**/reduced travel times if, for example, video consultation is

used.
- Use of health data to **preventively** recognise possible questionable developments.

D07072022J: Being able to use devices alone and at home without the help of caregivers. For the elderly it is very important to be autonomous and to be able to stay at home without having to visit the doctor (especially in this Pandemic situation).

S04072022J: Firstly, the fact of not having to physically go to the doctor to be examined. The second point is the fact of being able to have all the patient's history in one online medical record.

M27062022J: A wide use of technology will allow all patients, not just over 65, to have access to health and enhance medical services. Being able to do things in the fastest and most effective way even if you are in a small village.

1-2-3:

- Through the use of digital health technologies, it is possible to monitor the daily course of the health of an older person by health professionals (doctor, nurse, etc.) with consistency and to receive the immediate provision of information by them in matters of prevention and best possible management of various (chronic) diseases.

- Furthermore, it enables people who have the daily role of caring for older people to become familiar with the use of these technologies, to understand their positive effect and then to mobilize in this direction the people who they take care of.

- Digital health technologies help patients self-manage their health conditions through regular monitoring and tracking of symptoms

- Familiarity with technology, safety from falls and prevention of health problems, better contact with the doctor, not being excluded from health services especially in cases of pandemic and confinement, or due to living in remote places

- They can save time and money, as they will reduce unnecessary visits to doctors for simple issues.

- Digital services can empower citizens, enabling them to take a greater role in managing their health, from following prevention guidelines and motivating healthier lifestyles to managing chronic conditions and providing feedback to providers health care. The increasing need for telehealth and m-health that comes along with digital literacy facilitates the shift towards integrated and personalized care systems, and subsequently favors the possibility for older people to remain in their home environment the longest possible.

Summary:

Access to information, help and medical advice from home. Daily health or illness monitoring and tracking of symptoms – the data is sent to a doctor, which can be a huge benefit for elderly people when it comes to managing symptoms, medication

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and illness alone at home.

"*Avoidance of treatment errors/polypharmacy through shared access to a document or cloud by the treating physicians. Reduction of hospital admissions. Possibility to influence one's own health more (and to get more responsibility in one's own hands). Lower entry threshold, e.g. to take part in a health course, if this can also be done digitally from home. Lower waiting times/reduced travel times if, for example, video consultation is used. Use of health data to preventively recognise possible questionable developments"* (DE).

22. In which areas/tasks could digital health technologies be helpful for people over 65?

- Everything promoting that the elderly can **live at home as long** as possible
- Classical **assistance/ and monitoring systems**,
  - providing more security
  - reminding people of appointments, doctor's appointments
  - turning off the cooker,
    - informing, the neighbour, the care service, whoever, if I have a fall
  - GPS tracking of relatives with dementia
  - Fall mat that notifies when senior has not crossed it for a certain number of hours.
- **Safety, household, care**
- **Social participation** and integration
- **Tips and guidance** with the help of videos

D07072022J: Telemedicine

S04072022J: The whole branch of telehealth, tele-monitoring, tele-assistance. In addition, the online health record.

M27062022J: In the screening and control areas.

1. Digital Health Technologies could be used for people with chronic diseases, frailty, and for people with neurocognitive disorders (e.g. Alzheimer's) specifically through mental empowerment applications in order to reduce the progression of the disease and maintain functionality. Also, through the application of sensors, that can monitor the daily course of the person's health in order to prevent further deterioration.

2. Prescription, medical monitoring, prevention from various diseases, prevention of falls, detection of risk situations or of early stages of diseases etc.

3. Monitoring of vital signs in daily order, avoidance of health threatening situations, timely diagnosis, timely application of health interventions

Summary:

The main focus would be on home assistance and health monitoring, as previously mentioned. Therefor telehealth, telemonitoring, teleassistance is needed. But also

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providing elderly people with information, participation options and guidance.

"Digital Health Technologies could be used for people with chronic diseases, frailty, and for people with neurocognitive disorders (e.g. Alzheimer's) specifically through mental empowerment applications in order to reduce the progression of the disease and maintain functionality. Also, through the application of sensors, that can monitor the daily course of the person's health in order to prevent further deterioration" (GR).

23. What do you think is necessary to integrate more digital health technologies into the everyday life of people over 65?

- These people have to **get the information in the first place** (many do not even know that such services exist).
  - how do I use these offers?
  - how can I order them online?
  - Where can I find providers?
  - Where can I perhaps try this out?
  - For services, the question would be via which platform, which app do I need to download?
- You have to see/**recognise the added value** in the first place, be interested in digital services.
- They must be **fundamentally familiar with smartphones** and tablets
- **Usability**: how must a service, a technology be designed so that older people with perhaps cognitive or motor impairments can use it?
- **Social support/network:** people who build up a network where they support older people in dealing with new technologies, that should be a continuous accompaniment. Involve relatives
- **Financing** or many of the offers are often still too expensive or are no longer financed.
- **Technology:**
  - What happens if a system suddenly stops working
  - Who takes care of the maintenance, the service, the installation?
- Weigh up **legal and ethical aspects**: Comfort or security vs. paternalism, control.
- The basic prerequisite for something like this is that people are **interested in digital technologies** in the first place.
- There is still a **"technological leap"** that needs to come:
  - Automatic collection of data without extra logging in.
  - Significantly simpler operation (e.g. video consultation), e.g. through voice recognition.

D07072022J: Certainly yes, applying IT to the basic aspects of life can save people time (and life).

S04072022J: Yes, but we should try to simplify the devices so that the over-65s can use them (User-friendliness, less buttons, less apps, etc.).

M27062022J: No, because the availability of technology is in excess. What is needed is digital training for caregivers which allows them to acquire know how and then to pass it to the over-65s.

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1. Simplifying the instructions and how to use them in order to familiarize older people with them. Informing people about the use of technologies by health professionals (eg Personal Doctors) who can help to increase the elderly's confidence in the use of similar technological applications.

2. Familiarity with technology and the use of the internet, as well as access to an internet connection. In other words successful digital health literacy among older people presupposes the achievement of digital literacy.

- Also it is important the adoption of the right policy measures for older people to be able to obtain digital tools, given the financial restrictions they probably face.

3. There should be raising of awareness and training of people over 65 years old and at the same time the systems to be used should be simple and easy to use.

Summary:

First of all: knowledge. Elderly people need to know how to use digital health technologies. Part of it would be:

- *How do I use these offers?*
- *How can I order them online?*
- *Where can I find providers?*
- *Where can I perhaps try this out?*
- *For services, the question would be via which platform, which app do I need to download?*

(DE).

And:

"*Simplifying the instructions and how to use them in order to familiarize older people with them. Informing people about the use of technologies by health professionals (eg Personal Doctors) who can help to increase the elderly's confidence in the use of similar technological applications"* (GR).

24. What do you think is the reason why people over 65 might not use digital health technologies?

Lack of information

- Many people are often simply unaware of certain solutions
- Lack of experiential spaces, e.g. lack of model flat

Lack of people/mentors/ambassadors

- We do not have enough people who are made fit so that they can then also inform about it.

Lack of funding

Inadequate technology/solutions

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- **Too complicated** (if you buy a smartphone today, the first thing you have to do is create an account and have an email address = insurmountable hurdle for some)

Attitudes/lack of acceptance

- Afraid of having to pay money because they click on something wrong
- No discernible added value
- Feeling they can't cope: now I've lived without it for years....
- No digital literacy
- If the digital education, this trying out, this understanding of such contexts has not been trained, then even good will and a lot of effort is of no use.

D07072022J: Over 65 people have always the same habits and fail to understand the importance to enhance digital skills. It has to be clear that using digital devices (such as: platforms, telemedicine, etc.) is identical to being in person in front of the doctor.

S04072022J: Because people over 65 tend to be unwilling to learn new things.

M27062022J: At the moment, the approach is wrong. The patient must be the starting point for developing digital health technologies.

1-2-3. The lack of awareness and knowledge about technological developments and the absence of digital literacy among many people over 65 may discourage many people who, although they want to, are very reluctant to use digital health technologies. Still, among people over 65 there is a big percentage of digitally illiterate people, and for many of them, as they grew up without technology, to learn about these things is confronted with scepticism, if not with absolute denial. Also the high cost of many applications makes it a particularly inhibiting factor for their acquisition especially for people of low financial scope.

Summary:

All interview partners agreed on the fact that one of the biggest problems is the lack of knowledge. Digital health technologies often are too complicated, not known enough or the importance / benefit of their usage is not clear.

"Too complicated (if you buy a smartphone today, the first thing you have to do is create an account and have an email address = insurmountable hurdle for some)" (DE).

25. What would help people over 65 to increase their skills in using digital health technologies? What stands in the way?

Actively seeking out the target group

- You have to have someone who can go there and help.

Longer-term support for seniors

- Long-term support in the use of these technologies.
- Have a permanent contact person to help with problems and questions,
- In the past we always thought, "I'll explain how it works and then I'll say goodbye".

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- Volunteers who do this

Instructional videos

- I think if you make videos, you have to be able to find them somewhere digitally.

Accompanying the volunteers

- Of course you can't leave them alone, so that's why you have to train them, make it possible for them to exchange information and so on.
- It would be important to use people with a high level of digital competence, who are active in whatever form in the health sector, as multipliers.

Experimental spaces

- "Now you get a tablet here, try it out".

D07072022J: After the first approach to DHL, the over-65 needs daily practice in the use of new technologies because they lack of constancy in applying new technologies.

S04072022J: We must remember that the real interface between the technologies and the patient is the doctor or the caregiver. These health figures need to be trained to teach the use of technologies to people over 65.

M27062022J: First of all, analyse what are the residual skills of the elderly and adapt the technology to their reach.

1. The existence of programs from lifelong learning structures (Short study programs) or third-age structures (Day Care Centers) on the correct application and use of digital technologies would have a particularly positive effect on older people.

2. An organized program of training and familiarization with the internet and new technologies is required, as well as of the benefits they for older people from the use of the new technologies. An obstacle may be the financial difficulties of some families

3. Their refusal towards new technologies is a barrier, so it is important the new knowledge to be offered in a simple manner

1-2-3. There is a clear need that information and education of people over 65 to be adapted to their cultural, educational and social conditions of living. Since we speak for such a versatile target group with so different needs and requirements it is very essential all this information to be adjusted to these parameters, as otherwise older people will not be able to comprehend and to follow the developments and the benefits of digital health technologies.

Summary:

The following sentence / respond summarized well the concept of lifelong learning:

"After the first approach to DHL, the over-65 needs daily practice in the use of new technologies because they lack of constancy in applying new technologies" (IT).

On the one hand it is important to actively seeking out the target group and to provide

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a long-term support in the use of these technologies. On the other hand a permanent contact person to help with problems and questions is needed and instructional videos can be helpful.

Perspective direct target group/future mentors: development opportunities, chances, obstacles

Imagine training people over 65 in the use of digital health technologies…

26. What is your perception regarding the current status of digital health literacy of informal, low trained caregivers or volunteers?
General statements ○ You can't give a blanket answer, it varies a lot. ○ People who work in the health or social sector are not among the most tech-savvy people. ○ Basically, you have to train and educate a bit more than perhaps in other sectors and with a different target group. ○ And that's why you have to provide a lot of training, or a curriculum has to include a lot of things, so that these people are made fit accordingly. That is not a matter of course. **Young carers** ○ If they are young people, just because they use media does not mean they are competent. ○ And maybe these people don't have the great acceptance of wanting to acquire it, but are the classic users. ○ I hope that their own experience will help, they may not know why it does what it does, but they know exactly how it does it. They know which buttons to press. And then it's "Grandma, don't be so silly". **Informal Caregivers:** ○ On the other hand, I would also see relatives as informal caregivers. So from that point of view. And they can be from any field. ○ That's a large group, which then differs again. **Volunteers/digital ambassadors:** ○ I can't say much about health literacy, but our volunteers are often IT experts with many years of experience.
D07072022J: There is a high knowledge of basic technologies among young, low trained caregivers. In the under-50 age group, knowledge is almost 100% but, unfortunately, above this age it drops by half. **S04072022J:** In Italy we have many informal foreign caregivers (Ukrainian, Moldavian, Romanian, etc.) who are absolutely capable of using technological devices (PC, Tablet, Mobile, Smartphones). If educated properly, they could be a great resource.

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M27062022J: Basic training currently exists, more in-depth training is necessary.
1. In the present time, due to the pandemic, the demand for digital technologies has increased from informal caregivers and low-educated professionals, nevertheless, still a large percentage of them does not have the appropriate skills on how to use them for the people they care for (with greater difficulty showed by caregivers aged 50 and over). 2. They need more training because many of them they know the basics like using social media and Google. This knowledge should serve as the basis for attracting their interest and inserting them into digital health technology domain 3. We need to have qualified and trained caregivers on digital health literacy, that can follow a continuous training program and be able to communicate with the health care sector effectively. To obtain this though, it is needed any training to be accompanied by certain facilitations by the government policy so for these people to be able to dedicate their time without negative impact on their jobs or other family obligations
Summary: It depends on their age and usage of digital health technologies in everyday life. "*There is a high knowledge of basic technologies among young, low trained caregivers. In the under-50 age group, knowledge is almost 100% but, unfortunately, above this age it drops by half*" (IT). Digital health literacy does not only mean to know how to use digital devices but also which information is serious and which is not.

27. How can informal, low trained caregivers and volunteers strengthen older adults to adopt new technologies?
See question No 12
D07072022J: The platforms for digital Health used by Caregivers should be modular, in order to be able to adapt it to the needs of the elderly to facilitate learning. **S04072022J:** A training course must be created that links the carer and the over-65. The carer must first be trained and then he/ she can educate the over-65. **M27062022J:** As a first step, technologies should evolve to become more usable by all, despite aging. As we have not reached yet this point, caregivers should encourage the elderly to use Digital tools in a gradual way.
1-2-3 - Through training, being aware of the benefits of new technologies, and of

modern tendencies. Also, the practical application of technologies by health professionals (doctors, nurses, social workers, etc.) in the homes of the elderly in the presence of caregivers would help to better understand their use and would give additional motivation for their application on a daily basis.
- By getting informed on the benefits of digital health technology. Caregivers should be alert and assume initiatives to pass this information to their care recipients
- By asking the health care to staff and doctors.

Summary:

Trough courses: A small group size has been mentioned as an important component. Also lessons, which aren't too long, with a lot of repetition instead. The introduction should be very practical and in a simple language.

"Through training, being aware of the benefits of new technologies, and of modern tendencies. Also, the practical application of technologies by health professionals (doctors, nurses, social workers, etc.) in the homes of the elderly in the presence of caregivers would help to better understand their use and would give additional motivation for their application on a daily basis" (GR).

One respond was that digital health technologies need to be more adapted to elderly people first – or at least, apps especially for elderly people should be used in the trainings.

28. What do you think are the advantages of educating mentors to support people over 65 in the usage of digital health technologies in their everyday life

Otherwise not financially viable

- Ultimately we need these people
- Financially not possible if you want to reach many seniors.
- If they are informal carers, then it has the advantage that they already have experience in the care and social sector.

Direct contact person

- But a certain relationship of trust.
- Disadvantages of mentors
- They invest in the training of mentors and since it is voluntary, they can be gone tomorrow (e.g. if grandchildren are born or they no longer feel like it).

Alternatives to mentors?

- So the mentors thing, I don't see how it can be done any other way
- Digital bot: interacts with seniors via voice recognition. Example communication: "I have the measuring device", then the bot says "What kind of measuring device do you have?" And then he will ask: "Is this your measuring device blue and square?" And then: "Yes". "What do you want to know?" (That the senior can be asked/ interviewed without having to become active now).
- Hybrid: you send the senior e.g. videos

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D07072022J: The major advantage is that the quality of life of the people over 65 in general will increase but we must consider that a caregiver is not always present with the elderly.

S04072022J: General improvements in quality of life and health.

M27062022J: In the first instance, it will be crucial to train the mediators to support the over-65s, but ideally, this support should be withdrawn gradually.

1-2-3. The training of informal caregivers to act as mentors on the use of DHT has a clear advantage for them since it enables people who have the daily role of caring for the elderly to familiarize themselves with the use of these technologies, understand their positive effect and then motivate more efficiently in this direction the people they care for.

Summary:

It is very important that “a real person” teaches elderly people because the direct contact would be the easiest and most comfortable way for elderly people to learn. For people in third age the benefits of using digital health technology correctly are the general improvements in quality of life and health.

“*The training of informal caregivers to act as mentors on the use of DHT has a clear advantage for them since it enables people who have the daily role of caring for the elderly to familiarize themselves with the use of these technologies, understand their positive effect and then motivate more efficiently in this direction the people they care for”* (GR).

Training/level of didactic knowledge

Imagine a training designed for people over 65 in the use of digital health technologies…

29. What general conditions would be needed to succeed in this?

Requirements

- The operation of the devices and the selection of the devices are already important.
- Concentration on smartwatches, smartphones and tablets?
- If it is clear how such a device works in general, many inhibition thresholds have fallen.

Participant composition

- Small group size, I think that is very important.
- So the whole thing has to be done in pairs (one helps with any problems that arise).
- Seniors are interested in the topic and have basic digital skills.

Way and manner

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- Not too long (attention simply wanes).
- Do not train too much at once
- Lots of repetition
- Lots of practice, not/very little theory
- Lots of trial and error
- Step-by-step instructions and then test what did not work
- Simple language
- Many pictures
    - Help for self-help is important.
    - How can I help myself if I have a technical problem, where can I find information?
    - Which pages can I use and which are rubbish?
- Handout
- Give a booklet, a book or other documents again

Building the platform/sustainability

- Gather interested mentors and create the training materials together with them.
- These mentors then train other mentors.
- In principle, you need to have one or two volunteers who then take care of the mentors, because on their own it will run dead and then they will do it the way they want to do it

Necessary: Actively create demand

- Make sure that the mentor really gets people/clients who want to know about health issues.

Didactics/target group:

- Informing and training them about the specifics of an older target group.
- Very important aspect for KommmIT (former Project Wohlfahrtswerk) in the education or training of these mentors.
- There is an app from the area of health that looks like this and this, you can do this and this with it and that is the added value for them.
- That you are dealing with a senior, a senior who may not be in the digital world
- Vocabulary, speed

D07072022J: Easy access and data entry such as using voice assistants.

S04072022J: Standard smartphone use, the ability to download and print a document, use SPID (Digital Identity), use a tablet even if only to interact with relatives.

M27062022J: Easy access to the training platform.

1. Presentations with small text and legible letters (easy reading) using photos and videos to understand the material. Practical application of technologies for better understanding of knowledge and familiarity with applications.

2. Continuing education, suitable drivers for the elderly, access to internet and tablets

3. Training should avoid complex terminology

Summary:

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A small group size has been mentioned as an important component. Also, lessons, which aren't too long, with a lot of repetition instead. The introduction should be very practical and in a simple language. An easy access and data security.

"*Presentations with small text and legible letters (easy reading) using photos and videos to understand the material. Practical application of technologies for better understanding of knowledge and familiarity with applications"* (GR).

30. What skills and methods are needed in order to train people over 65 in the use of digital health technologies?

Soft skills:

- Enthusiasm, patience, commitment.
- Extroverted?

Knowledge:

- Media education skills: how to deal with seniors
- Basic digital competence, but no programming skills
- Can stick to one's concept/follow a teaching concept

Critical reflection:

- Question functions, some ethically questionable.
- Not only know how to operate device, but also know in which situation to use it sensibly
- Know what happens to the data to be able to make an adequate decision
- Is someone trying to sell me something or is this really evidence-based information that I can use for myself?

D07072022J: Making videos that the users can watch several times.

S04072022J: First, we need to understand the user's learning level. Then we can structure a learning path built around the over-65s which respects their learning time. Then the training course should allow the caregiver and the over 65 to work together.

M27062022J: The fundamental thing is the practice, as the Over 65 are often afraid of making mistakes and/or breaking something.

1. The training should be done by people who have a clear knowledge of the special issues that people over 65 face, and of how they should be introduced to them for learning new skills and applying them in daily practice.

2. Assessment of their mental functions is required as many of the older people have cognitive decline and therefore need more detailed instruction and frequent repetition until the new knowledge is consolidated.

3. Clear training program based on patience, repetition, example based learning, visual representation

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Summary:

A mentor should be enthusiastic, patient and committed. He or she should be able to work well with seniors and have knowledge regarding digital health technology. Such as media education skills, basic digital competence, but no programming skills. Videos and working with pictures can be helpful.

"The training should be done by people who have a clear knowledge of the special issues that people over 65 face, and of how they should be introduced to them for learning new skills and applying them in daily practice" (GR).

31. What should we consider in online training (via an e-learning platform) educating mentors for digital health technologies for people over 65?
    - In general, do you remember a training you attended/designed that was particularly great?
    - If yes, what did it look like?
    - Can you describe what impressed you there?

Interaction of the participants:

- Calendar functions to make appointments with each other.

Interaction with teachers

- E.g. making teaching materials available online, so that I can
- That I can exchange information about it, kind of What's App/Zoom
- Show slides, make them available for download
- Step-by-step instruction manuals

Mentor-Senior interaction

- Be able to contact senior via video conference, perhaps part of the training also digital with senior

Determine scope

- How much time is needed to acquire the knowledge via the online platform (5 weeks with 2 h per week? 5 weeks with 5 days?)

Content

- Make clear why it might be worthwhile for mentor to engage with the content. Why should he do the health topic?
- "With us you are on the front line, on the current issues and could of course use your knowledge yourself"

High level of practical relevance/everyday relevance and language

- A lot of practical relevance, mentors have also tried things out for themselves, e.g. the electronic patient file.
- If someone wants to know about googlemaps, it's exactly the same as if I have a pacemaker: What tools are there that I can use to do this or something similar?

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D07072022J: Create a section of the platform where caregivers can contact a DHL expert in case of need.

S04072022J: Training them in cybersecurity to manage the privacy of the people they take care of. Also, explaining what a medical act really is and its characteristics.

M27062022J: Focus on online tutorials which give the opportunity to do practical tests and exercises to understand if caregivers are really able to manage the situation.

1-2-3

We have participated into trainings for getting introduced into DHT applications. In these trainings the main characteristic was the simplified manner of analysis of the function, as well as the connection of the application's function with the needs and requirements of the care receivers.

Summary:

Teaching materials available online, a section of the platform where caregivers can contact a DHL expert in case of need and online tutorials that can be repeated.

"*In these trainings the main characteristic was the simplified manner of analysis of the function, as well as the connection of the application's function with the needs and requirements of the care receivers"* (GR).

Other projects/further comments

32. Do you know other projects connected to DHL?
    - What should we be aware of?
    - How can we compliment to these projects?

Following are all sites, all projects, to ensure that **older people are not digitally left behind.**

Including questions like:

- What kind of health apps are on the market?
- How do I get there?
- Do they cost anything?
- If so, do I get paid for them?
- If so, by whom?
- What happens with my data?

There are **materials for people who run smartphone courses**, like me, for mentors. The materials are already prepared for the 65plus target group.

- "Silvertips": die das Thema Medienkompetenz aufnehmen.
- "Digitales für Einsteiger",
- "Kompetenzzentrum digitales Lernen",

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- "Digital Kompass.de",
- "Deutschland sicher im Netz"
- "Onliner-SAR"
- "Digital mobil im Alter"
- "Stiftung digitale Chancen"
- "Digital packt Alter"
- "Digital Senioren.de"
- "Forum Seniorenarbeit NRW"
- "Landesanstalt für Kommunikation (LFK)": Very good app (start-up aid) to try out in a protected digital space, also works offline, training material for volunteer mentors on how they should then pass this on to their learners
- Consultation hours from the Wohlfahrtswerk

Other points of contact

- Nursing training, digital health skills will already be taught there

D07072022J: No.

S04072022J: AMMA Association Molisana Alzheimer's Patients- training for caregivers who have to deal with Alzheimer's patients.

DIGIHALL has a different target group but we can consider their methodology and approach to the target group.

M27062022J: No.

1-2-3

TECH CARE Erasmus plus project, is a project that in essence tried to map the path towards the Digital literacy for informal caregivers and older people in need of care.

Summary:

In all three countries similar projects are known, which concern digital health technologies or literacy regarding seniors / elderly people. Also a few training programs for nurses and volunteers are known.

"*Kompetenzzentrum digitales Lernen*" (DE)

"*AMMA Association Molisana Alzheimer's Patients- training for caregivers who have to deal with Alzheimer's patients*" (IT).

"TECH CARE Erasmus plus project, is a project that in essence tried to map the path towards the Digital literacy for informal caregivers and older people in need of care" (GR).

Review

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33. Looking back on the course of our conversation, is there anything else you think we should know or consider with regard to this goal?
Status of the target group ○ Do not lose sight of the fact that people really often start where you turn a device on and off. **Sustainability of the project** ○ That you are now working on interesting topics in the projecta and when the project is over, that it then dies **Ensure follow-up funding, through:** ○ Public institutions, the city, funding agencies, perhaps welfare organisations, health insurance companies. **Example of other organisations in Stuttgart:** **Workers' Welfare Association (AWO):** ○ Promote itself as a digital provider. ○ has W-Lan in their facilities and day-care centres ○ offers consultation hours when you need to order something ○ Mentors can use e-bikes to go to seniors' homes. ○ Seeks volunteers to offer courses on internet etc., free of charge for seniors, who then also stay for lunch and other events. **Evangelische Heimstiftung:** ○ They have a tablet with software that is suitable for senior citizens. They simplify that, but only to specific points.
D07072022J: Issues such as home automation and remote surveillance must also be considered. The over-65s could benefit from it because no action is required by them and everything is automated. **S04072022J:** You have to bear in mind that it is not a question of age or morbidity but of frailty, the needs are related to these aspects. The advice is that something has to be designed for the person being cared for. A customised package for each user and considering the environment and the people around them. **M27062022J:** The advice is clear, whatever you have in mind, you should always plan it for the patient.
Mentors should focus on trying to present new technologies as a useful tool in care of older people, that can facilitate the work of physicians and health carers or caregivers. To do so they have to take under consideration, apart from the living conditions and the physical or mental status of caregivers and older people, certain facilitators and barriers that affect the acceptability of new technologies on their behalf. Furthermore, they must emphasize the role of DHT into enhancing the autonomy of older people, without restricting the free will of care recipients or without compromising the need for human contact.

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Summary:

"*Do not lose sight of the fact that people really often start where you turn a device on and off"* (DE).

The whole subject needs to be presented and taught positively. Elderly people need to see it as an advantage to learn about digital health technologies. Also the courses need to be customized to their target group – depending on the skills, they already have.

34. Additional question for evaluation (was not included in the interview guide): Did you, as the evaluator of the interviews, have any other findings from the interviews that have not been mentioned so far and that are important/ relevant for the further implementation of the project?

- Applications to increase **social participation** should also ultimately promote **(mental) health**. Social isolation leads to depression, leads to health impairments, costs the state money.
- **Assistance systems** is the same in the area of safety, here it is ultimately also about health/prevention, or is that too far away from digital health literacy?
- **Train the trainer** was also recommended. Does this mean for us that, under the keyword "**sustainability"**, each country must consider for itself how it can ensure that the learning platform is actually used and **that seniors are really supported through it?**
- **Legal and ethical aspects** must also always be weighed up.

Results: (empty)

Results: (empty)

Summary:

Applications to increase social participation. Mental health needs to be focused on too. The components sustainability and legal and ethical aspects need to be looked after too.

"Train the trainer was also recommended. Does this mean for us that, under the keyword "sustainability", each country must consider for itself how it can ensure that the learning platform is actually used and that seniors are really supported through it" (DE).

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