

Smartphone use by older people in German-speaking countries: A qualitative systematic literature review

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Abstract

Background: In recent decades, smartphones have become ubiquitous tools in Germany. Despite the increase in smartphone use, there is a digital divide between young and old smartphone users.

Objective: This study aimed to determine how German-speaking senior citizens use smartphones.

Method: The authors performed a qualitative systematic literature search. The following databases were used: MEDLINE, CHINAL, PsycINFO, PsycARTICLES, GeroLit, and ERIC. The following inclusion criteria were defined: (i) research groups over 60, (ii) German-speaking research regions, and (iii) publications since 2007.

Results: In German-speaking countries, 21 publications on smartphone use were found. Eleven publications were published in Germany, four in Austria, and four in Switzerland. Two publications compared smartphone use in Germany, Austria, and Switzerland. A further novel finding is that based on Mayring's qualitative content analysis, the following main categories were formed: (i) General and Application Usage; (ii) Learning and Inclusion; (iii) Health Assessment and Corona Pandemic.

Conclusion: Based on the available research, it can be inferred that in some countries, the 60+ age group does not use smartphones as much. Despite this, Switzerland has more healthy smartphone users.

Keywords: smartphone, older people, elderly, Information Communication Technologies (ICT), health apps, mobile phones

INTRODUCTION

This research constitutes an important topic that has emerged from understanding smartphone usage by elder people in German-speaking countries known as Germany, Austria, and Switzerland.

In other countries, the topic is already well-researched e.g. Columbia, China, and Canada. (Leonard & Hebblethwaite, 2017; Ricardo-Barreto et al., 2018; Zhao et al., 2020). Nevertheless, the attitude toward new technologies in German-speaking countries is described as rather reserved. Classic "cell" phones without touchscreen and with keypad input are still being sold in German-speaking countries. (Seifert et al., 2020; Tenzer, 2022). It is also apparent that the network infrastructure is not as well developed as in other countries. Among other things, this is due to legal hurdles, topography, population density, and different network expansion strategies (Ian Fogg, 2023). This results in practical problems in everyday life, such as the integration of older people e.g., in public transport, which largely relies on smartphone use, or online bank-

ing, which in some cases requires a smartphone. There are also advantages for smartphone users, such as flexibility and cheaper offers when shopping online or purchasing services such as public transport tickets. Germany, Austria, and Switzerland have been discussing and focusing on the topic of digital inclusion since 2014, including the keyword digital ambassador for elderly. The Digital Ambassador aims to narrow the digital divide between older and younger people and empower older people (Amann-Hechenberger et al., 2015; Seifert et al., 2020; Streim). In addition, innovations often take longer due to legal requirements such as the German Data Protection Act (DSGVO) in Germany and Austria and the German Data Protection Act (DSG) in Switzerland instead of countries without these legal requirements (Grube et al., 2020; Sury, 2020). Thus, the scientific findings from other international countries, e.g. Columbia, China, and Canada (Leonard & Hebblethwaite, 2017; Ricardo-Barreto et al., 2018; Zhao et al., 2020), cannot be applied to the specific German-speaking research area and further investigation is required.

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Previous studies in gerontology have focused on internet use by older adults. This yielded largely validated findings. New application areas have evolved with smartphones, such as mobile Internet usage, mobile applications (apps), and mobile health assessments. Gerontological studies only included smartphone use by older people and did not focus on it. Nevertheless, a recent study found that it is described that *"the smartphone [...] has become an important everyday mobile device for information search and communication recently"* (Seifert et al., 2020).

This results in practical problems in everyday life, such as the integration of older people in public transport, which largely relies on smartphone use, or online banking, which in some cases requires a smartphone. There are also advantages for smartphone users, such as flexibility and lower rates in some cases.

In addition to the original telephoning and text messaging, the camera and the Internet browser have been added. This development has increased significantly in the last five years, so the smartphone can now be used as a means of payment, ID card, driver's license, and car key. Several recent studies have shown that the smartphone can be used as the control center of the smart home to turn the lights on and off, control the garden irrigation, open the door, and display the surveillance cameras. In addition, the integrated GPS can be used as a navigation device, and a means of transport such as a car, cab, or e-scooter can be hired thanks to an app (Berner et al., 2020; Bundesamt für Statistik, 2022; Deil, 2020; Eurostat, 2022; Seifert et al., 2020).

The literature review shows that the smartphone can record and transmit health data to the doctor. The smartphone often acts as a gatekeeper for setting up and using additional health monitoring devices such as wearables or medical measuring devices (Hsieh et al., 2019). Current research suggests that the smartphone partly takes over information retrieval tasks for which only the computer was available a few years ago (Seifert et al., 2020).

Original research has looked at the media literacy of older people. It quickly became clear that there is a digital divide between older and younger people. For Example, Internet use in Germany among older people aged 60 to 69 is 72%, and only 34% of people aged 70 overuse the Internet, compared to an average of 94% of younger people. In addition, digital literacy in the form of the ability to find the information they need on the internet is significantly lower (17%) than among younger people (Tenzer, 2022). In addition, the literature showed

that there is already much research on using the Internet by older people. However, the use of the Internet and the interaction with technical devices such as computers have changed significantly in recent years. Internet use has become increasingly mobile, and smartphones have become established. As an illustration, the classic computer and the stationary Internet connection are used less and less. Younger age groups are already intensively using smartphones, unlike older age groups. Various studies have already been conducted in German-speaking countries in which the smartphone use of older people has been included. Based on existing research findings, it can be assumed that, depending on the country, smartphones are not used to the same extent among older population groups aged 60 and over in the post-occupational phase of life (Amann-Hechenberger et al., 2015; Kaspar et al., 2023; Seifert et al., 2020; Stubbe et al., 2019). Country-specific smartphone use has not been adequately studied and contrasted; thus, a research gap can be identified. Thereupon, the research question arises: "How do older people over the age of 60 of life in German-speaking countries (DACH) use their smartphones?"

METHODS

The authors in this section elaborate on the methodology used to complete this study. Due to the preliminary study already carried out on the media literacy of older people, the research period could be considerably shortened. A literature search was conducted between 2nd January and 28th February 2023, searched in English and German. The study area DACH region was chosen due to demographic changes in the German-speaking region, an aging population, and the regional focus of the researchers.

Since the topic has been little researched so far, the authors chose a qualitative systematic literature approach. Both qualitative and quantitative studies were included. A qualitative systematic literature first defines the Thematic Similarities and then defines the inclusion criteria. Subsequently, the comparability of the methodological approach is determined. *"Reviews consider a wide variety of different perspectives. This calls for careful development of pre-defined quality criteria for critical assessment"* (Hasseler, 2007). The definition of older people was set to 60 years in the research work based on the Federal Anti-Discrimination Agency and the Centre for Community Solutions (Antidiskriminierungsstelle, 2024; Muttillio, 2018). After careful analysis, the following quality standards have been defined: (i) the research group of the publication had to be persons over 60 years old; (ii) the study area must include at least one of the German-speaking countries; (iii) Issued after 2007 due to the launch

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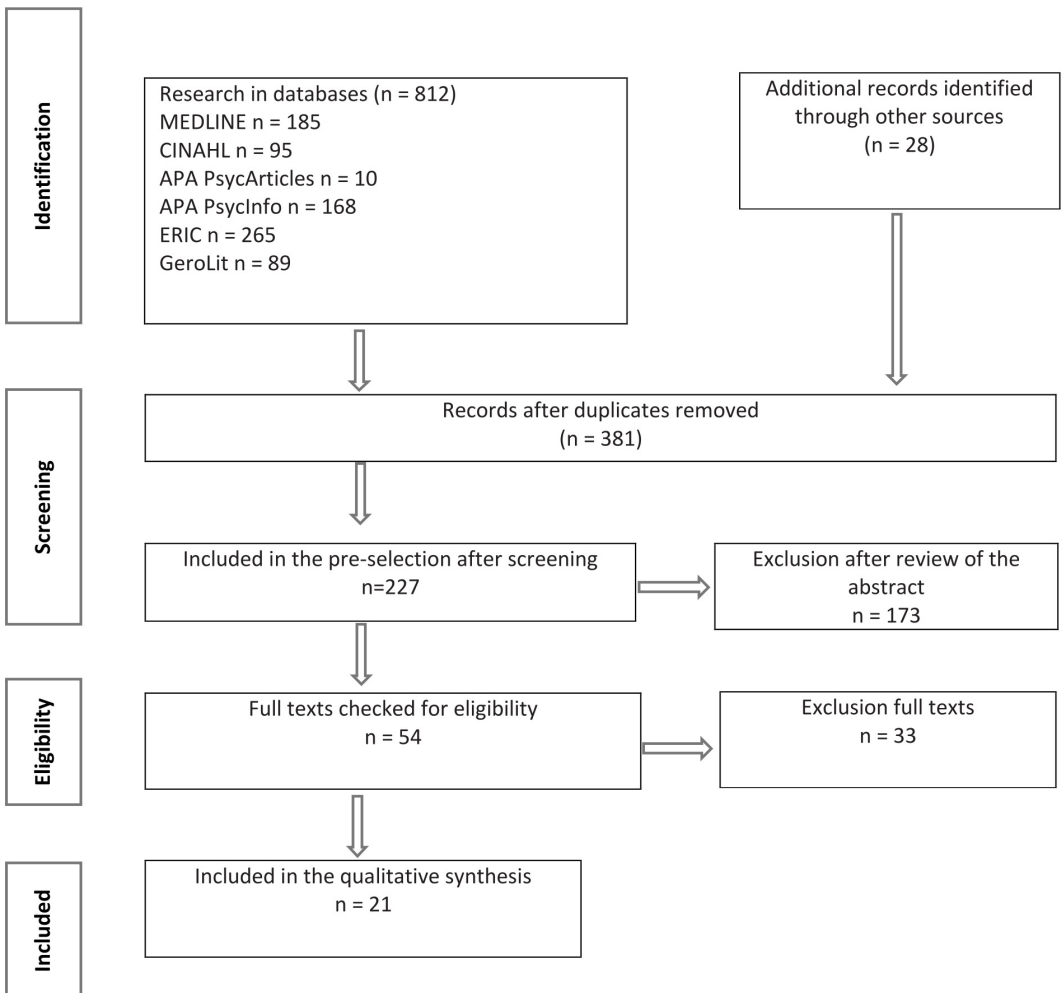


Figure 1. Prisma Flow Diagram: Illustration of the inclusion and exclusion process

of the first commercially successful and industry-embracing smartphone ("Apple Erfindet Mit Dem iPhone Das Mobiltelefon Neu," 2007; Bärlocher, 2022; Eder, 2022; Maisch & Meckel, 2009). In addition, care was taken to identify major schools of thought, examine different perspectives, explore different disciplines, and perform hand searches in addition to database research. Due to the qualitative research approach and the not yet heavily researched field, no non-peer review articles were excluded (Hasseler, 2007).

PRISMA (Preferred Reporting Items for Systematic Reviews and Metaanalysis) guidelines were used to select publications (Figure 1). PRISMA helps to visualize the flow of information and the phases of the review. By using PRISMA, the number of identified, included, and excluded articles as well as the reasons for the excluded articles can be visualized. Firstly, all studies on the topic were identified. After identification, the studies were screened, first for duplicates and

later for inclusion criteria. After screening, the complete texts were analyzed and filtered again according to the inclusion criteria (Moher et al., 2015; Page et al., 2021).

Based on the access, the following databases were used: CHINAL, PsycARTICLES, PsycINFO, MEDLINE, GeroLit, and ERIC. Given the limited depth of existing research on the subject matter, Google Scholar was employed in conjunction with previously utilized databases to facilitate a more exhaustive search for potential grey literature pertaining to the topic. In addition, a hand search was conducted on the websites of the federal statistical offices in Germany, Austria, and Switzerland. A hand search was also conducted on Statista. Therefore, the following terms were used for the literature search: "older adults", "elderly", "aged", "older", "elder", "geriatric", "elderly people", "old people", "seniors", "smartphones", "mobile phones", "use", "usage", "communication", "telephone", and "technology

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Table 1. Characteristics of included studies

Authors	Study design	Methods	n	Population
Steinert (2017)	Qualitativ	Pilotstudies	30 36	Germany
Stubbe et al. (2019)	Mixed Methods	Qualitative Interviews Online Survey	97/300 30	Germany
Berner et al. (2020)	Qualitative	Literature research	not specified	Germany
Doh (2020)	Qualitative	Literature research	not specified	Germany
Schramek & Stiel (2020)	Qualitative	Expert opinion	not specified	Germany
Tenzer (2020)	Qualitative	Questionnaire	various sample size	Germany
Haeger (2021)	Quantitative	Case-control studies	34	Germany
Hermann et al. (2021)	Mixed Methods	Computer-assisted personal interview [CAM]	16.158 2.038	Germany
Hermann et al. (2021)	Mixed Methods	Computer-assisted personal interview [CAM]	16.158 2.039	Germany
Hermann et al. (2021)	Mixed Methods	Computer-assisted personal interview [CAM]	5.786 473	Germany
Kaspar (2023)	Quantitative	Questionnaire	3233	Germany
Amann-Hechenberger (2015)	Mixed Methods	Guided interview Focus group Usability test	35 14 32	Austria
Peterbauer (2020)	Quantitative	Statistical survey	22.500	Austria
Tenzer et al. (2020)	Quantitative	Questionnaire	various sample size	Austria
Roth-Ebner & Oggolder (2023)	Qualitative	Guided interview	21	Austria
Turulski et al. (2020)	Quantitative	Questionnaire	various sample size	Switzerland
Seifert et al. (2015)	Quantitative	Computer-assisted personal interview [CAM]	1149	Switzerland
Seifert et al. (2020)	Quantitative	Computer-assisted personal interview [CAM]	1037	Switzerland
Seifert et al. (2022)	Quantitative	Computer-assisted personal interview [CAM]	1037	Switzerland
Deil et al. (2020)	Quantitative	Online survey via e-mail dispatch	1100	DACH
Eurosat (2022)	Quantitative	Statistical survey	various sample size	DACH

acceptance model", and the shortcut "TAM". The search strategy is available and can be requested from the author.

Due to the fact that the Technology Acceptance Model (TAM) is the most widely used in comparison with the Theory of Reasoned Action (TRA) and the Unified Theory of Acceptance and Use of Technology (UTAUT), this was included in the literature review (Al-Emran & Shaalan, 2021; Bandow, 2009; Davis, 1989).

Mayring and Fenzl (2019) described qualitative content analysis approach was chosen to assess the publications. Qualitative content analysis is an evaluation method that can evaluate large amounts of material in a strictly rule-guided manner. It is used in the context of social science research projects and can be applied, among other things, to the evaluation of transcripts as well as

documents and newspaper market research. Marrying names different techniques of qualitative content analysis: (i) summarizing content analysis/inductive category formation, (ii) explication/context analysis, and (iii) structuring content analysis/deductive category application. In the present work, the summarizing content analysis was applied, and as Mayring writes "the material was first reformulated into the content-bearing paraphrases and then reduced step by step, following the macro-operators of summarization" (ebd.). Thus, three new main categories could be formed from the publications found, and new perspectives and thus new insights on the smartphone use of older people could be gained.

A PROSPERO ID was created for the Systematic Literature Review. The CASP (Critical Appraisal Skills Programme) was used as an instrument in this study. The CASP checklist, which is used for

Table 2. Overview of the results of the individual publications by category

Authors	General and application usage	Learning and inclusion approaches	Health assessment and Corona-pandemic
Steinert (2017)	It was found that the research participants were not satisfied with the smartphone's battery rental and screen size.	It was found that training and support concepts are necessary for the health app on the smartphone to be used by older people in the long term	Socio-demographic data and technology affinity have an influence on the use of health apps. In addition, a simple reminder on the smartphone could significantly increase compliance among older people
Stubbe et. al. (2019)	Older generations in Germany often do not feel sufficiently informed and are unsure how to use digital devices such as smartphones. Digital skills are prerequisite for social participation in the future.	Self-directed learning is the focused. Various formal and informal forms can be used for this, such as Clubs and groups to which older people can bring their smartphones and receive help and explanations.	The publication omitted details pertaining to this particular field of research.
Berner et. al. (2020)	Smartphones are already widely used among older people. Social media for older people are seen as having great potential. In addition, complex smartphone apps tend to be a hindrance for older people.	The publication omitted details pertaining to this particular field of research.	The smartphone is used to record health data such as physical activity and vital parameters such as blood pressure, body temperature and heart rate
Doh (2020)	Some older people are not even aware that they are using the internet with certain apps. There is also a digital divide between offline and online users. Online users are much more likely to own a smartphone than offline users.	Older people prefer to be unreached by people of the same age. However, this is only a preference and not a recipe for success. In addition, informal learning is preferred. Mobile devices promote ICT learning.	Physical activity and vital signs of older people are already being collected on smartphones
Schramek & Stiel (2020)	The publication did not contain any information on this research area	Informal learning opportunities are preferred by older people and ensure that the learning content is absorbed more quickly. There are also already solutions on the market. For example, there is a company that provides tutorial videos and animated instructions.	The publication omitted details pertaining to this particular field of research.
Tenzer (2022)	The publication showed which devices are used by older people, how much willing to spend on their smartphones and how many people use smart assistants. Mobile internet usage was also broken down by age group. The average amount of time spent on smartphones per day was also examined.	The publication omitted details pertaining to this particular field of research.	The publication omitted details pertaining to this particular field of research.
Haeger (2021)	The publication did not contain any information on this research area	The publication omitted details pertaining to this particular field of research.	Haeger's field study has shown that smartphone-based health interventions can also be used and are possible in old age.
Hermann et. al. (2021)	The study summarizes and evaluates user groups. Two user groups of older people were identified. There are older people who still use a traditional phone and do not use the internet and older people who mostly use a smartphone.	The publication omitted details pertaining to this particular field of research.	The publication omitted details pertaining to this particular field of research.
Hermann et. al. (2021)	The study reveals differences in use between older and younger people. The smartphone is used differently depending on age and gender.	The publication omitted details pertaining to this particular field of research.	The publication omitted details pertaining to this particular field of research.
Hermann et. al. (2021)	The study shows differences in use by older people. The smartphone is used differently depending on age and gender, educational level and previous education	The publication omitted details pertaining to this particular field of research.	The publication omitted details pertaining to this particular field of research.
Kasper et. al (2023)	Kasper et. al (2023) found that several older people now use a smartphone, but that it is mainly only used when it is perceived as useful. In other words, very old people mostly still used a classic cell phone	The publication omitted details pertaining to this particular field of research.	The publication omitted details pertaining to this particular field of research.

Table 2. Overview of the results of the individual publications by category (cont.)

Authors	General and application usage	Learning and inclusion approaches	Health assessment and Corona-pandemic
Amann-Hechenberger (2015)	Experiences with smartphones vary greatly with age. The reasons for using such a device are not uniform and can include the fear of losing touch or social interaction.	The social environment plays an important role in learning. It makes a difference whether older people are intrinsically or extrinsically motivated. Printed instructions can be supportive, but are often difficult for older people to access.	The publication omitted details pertaining to this particular field of research.
Peterbauer (2020)	Older men were more likely to use smartphones than older women. Older women used more security software than men. Older men are more access conscious and restrict access to their smartphones more than women. Older people have so far lost relatively little data	The publication omitted details pertaining to this particular field of research.	The publication omitted details pertaining to this particular field of research.
Tenzen et. al. (2020)	It breaks down the mobile internet use of older people, the use of online shopping on smartphones, the way older people make phone calls and how older people take photos with their smartphones.	The publication omitted details pertaining to this particular field of research.	The publication omitted details pertaining to this particular field of research.
Roth-Ebner & Oggolder (2023)	The Smartphone is unique and the most important medium in the daily lives of older people. Whatsapp was described as the most important app for older people.)	The publication omitted details pertaining to this particular field of research.	The publication omitted details pertaining to this particular field of research.
Turulski et. al. (2020)	The static surveys focus on specific smartphone use. This included looking at the smartphone, receiving messages and using the smartphone to access the internet.	The publication omitted details pertaining to this particular field of research.	The publication omitted details pertaining to this particular field of research.
Seifert et. al. (2015)	The study shows that older people in Switzerland who use smartphones with mobile internet benefit from it and use it in their everyday lives.	The publication omitted details pertaining to this particular field of research.	The publication omitted details pertaining to this particular field of research.
Seifert et. al. (2020)	The smartphone also takes over tasks for older people that were previously carried out on a computer.	The effort required to learn a new ICT skill is often seen as high, which creates an inhibition threshold. The social environment can facilitate learning.	Health apps on a smartphone are already being used and offer potential. Vital signs were even measured and recorded and communication with doctors and alternative practitioners was used.
Seifert et. al. (2022)	Some technologies have already been adopted by older people. However, there are still areas where support is needed.	The publication omitted details pertaining to this particular field of research.	The publication omitted details pertaining to this particular field of research.
Deil et. al. (2020)	Deil's survey analyzes quite precisely what older people in Germany, Austria and Switzerland use their smartphones for. Among other things, the use of smartphones for older people is also evaluated for this purpose	The publication omitted details pertaining to this particular field of research.	Deil's work shows the impact of the coronavirus pandemic on smartphone use and examines the extent to which older people use their smartphones for health applications
Eurostat (2022)	Statistical Office of the European Union has a detailed breakdown of mobile smartphone internet use by age group. Here the countries Germany, Austria and Switzerland can be compared with each other	The publication omitted details pertaining to this particular field of research.	The publication omitted details pertaining to this particular field of research.
Eurostat (2022)	Statistical Office of the European Union has a detailed breakdown of mobile smartphone internet use by age group. Here the countries Germany, Austria and Switzerland can be compared with each other	The publication omitted details pertaining to this particular field of research.	The publication omitted details pertaining to this particular field of research.

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systematic reviews, helped to assess the quality and reliability of the work. In this way, the transparency of the research, the appropriateness of the literature search and the criteria for the inclusion and exclusion of studies, the assessment of the risk of bias, and the data extraction could be systematically reviewed.

RESULTS

A total of 812 publications were found via databases and 28 publications (grey literature) via other sources. After checking the publications found for duplicates, 381 publications were found. After checking the abstracts, 173 publications were screened out. A total of 54 publications were screened in full text. Of these, 33 studies were excluded due to other countries, newer research groups, or early publication.

Finally, twenty-one publications were founded on smartphone use by German-speaking older adults (Table 1). Most of these (11 publications) were carried out in Germany. Four of the publications found were done in Austria. Four of the publications found were conducted in Switzerland. Two of his publications comparing smartphone use in DACH countries were conducted in Germany, Austria, and Switzerland. Among the 21 relevant publications, the authors found ten quantitative approaches, six qualitative approaches, and five mixed methods.

This section summarizes the findings and contributions made. Smartphone use by older adults is documented in most German-language studies, but no representative studies have explicitly investigated smartphone use by older adults. Austria began researching smartphone use among seniors early on and, as early as 2015, gained insight into how seniors want and use their smartphones. The survey is small (Amann-Hechenberger et al., 2015). The phenomenon is similar in Germany. There are literature studies that shed light on the lives of older people in the context of digitalization and smartphone use, including various aspects such as social life, the digital divide, and the inclusion of older people.

Nevertheless, the authors cannot speak of representativeness here (Berner et al., 2020). Switzerland is the only country with a representative study of smartphone use among older people. In addition, the "Digital Seniors" survey, which documents the smartphone use of senior citizens, is being conducted for the second time and can thus show a development. It shows that smartphone use has increased compared to the last report and sees further potential for the future. (Seifert et al., 2020).

The following three key categories were identified: (i) General and Application Usage, (ii) Learning and Inclusion, (iii) Health Assessment, and Corona Pandemic. The topics are presented and described below with their associated subtopics (Table 2).

General and application usage

According to Roth-Ebner and Oggolder (2023), the smartphone is a special medium compared to other media such as e.g. the TV, it is the most important medium in everyday life due to its constant presence, it can offer prompt assistance and is characterized by older individuals as a supportive companion. The development from 2014 to 2019 shows that smartphone use has increased in the population over 65 in Swiss. Thus, more than 68% currently use a smartphone. Smartphone use is increasing faster than other technologies, such as computers (Seifert et al., 2020). In Austria, 49.8% of people between 65 and 74 used a smartphone. Men were more likely to use smartphones, 52.7%, than women, 47.4% (Peterbauer et al., 2022). The vast majority of people above 65 years in Germany (41%) used a smartphone in 2020. 25% used an ordinary cell phone, and only 8% used a special one for seniors (Tenzer, 2022).

Doh (2020) concludes that older people aged 80 and over are significantly behind older people aged 65 to 79. For example, 61% of people between the ages of 65 and 69 own a smartphone and 34% a cell phone. In the 70 to 79 age group, only 47% own a smartphone and 45% a cell phone. Among the over-80s, 22% own a smartphone and 60% a cell phone. In 2023 (Kaspar et al., 2023) found that about one-third (65%) of the very old (the-over-80s) used a cell phone, and 34% a smartphone. So even Smartphone use by the very old is increasing because the advantages and benefits of very old people are recognized.

In general, there are two well-known groups into which older smartphone users can be divided: (i) the offliners and (ii) the onliners (Herrmann et al., 2021a, 2021b). Onliners are elderly they already use the Internet and offliners are elderly they are still offline and don't use the Internet because there is no motivation to familiarize themselves with new functions and the benefits do not outweigh the estimated learning effort. Onliners are usually on average younger than Offliners. Onliners used their smartphones much more often on a daily basis (47%) than offliners (2%). (Doh, 2020) Compared with 2014, a limited number of online users own an old cell phone without an Internet connection, and more own a smartphone. The old cell phone is widespread among offline users. Some offline obviously use a smartphone but do not know it is suitable for mobile Internet use. In 2014, 34% were mobile

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online users; by 2019, that number had increased to 70%. Among those who also use the Internet on the move, 31.4% do so daily, 29.8% several times a week, 15.8% several times a month, and 23.0% use it less frequently. The people who use the Internet on the move own a smartphone in 94.5% of cases and a tablet in 58.8% of cases. (Seifert et al., 2020) According to Doh (2020), only 7% of offliners over 65 own a smartphone in Germany, whereas 61% of onliners already do. In fact, in the survey by Roth-Ebner and Oggolder (2023) made in Austria, all but one used a cell phone or smartphone. The one person who did not have a cell phone was visually impaired. People aged 80 and over are more likely to use conventional cell phones. People under 80 are more likely to use smartphones, tablets, computers, and newer wearables (Seifert et al., 2020).

Smartphone skills are assessed differently by older people in the respective countries. At 41%, Germany is far behind Switzerland (56%) and Austria (59%) when it comes to perceived good or very good smartphone skills among older people. (Deil, 2020) Older people in Germany between 60 and 69 would give themselves an average grade of 4.2 when it comes to smartphone use. 1 is best and 6 is worst. 70 to 79-year-olds already have a school grade of 4.9 and over 80-year-olds 5.4 (Doh, 2020).

Communication is a very important topic (Amann-Hechenberger et al., 2015; Berner et al., 2020). 46% of older people in Germany believe that the smartphone gives them more contact with other people overall. In Austria, 53% do so and in Switzerland, it is 59%. Anyway, the majority of Germans (46%) and half of the elderly in Switzerland hardly ever use their smartphones to make calls (less than 25%). Among Austrians, on the other hand, only 31% hardly use their smartphones to make calls - here, the smartphone is mostly (47%) used half for making calls and half for other services such as e-mail, photos, or the Internet. In Germany, this use is significantly lower at 35%, just as it is in Switzerland at 33%. In contrast, older people who use their smartphones mainly for making calls are very few in all three countries: 22% in Austria, 19% in Germany, and 17% in Switzerland. Accordingly, the intelligent functions of a smartphone are used by the majority of older smartphone users and are more important than the pure phone functionality (Deil, 2020). Anyway in Switzerland, 20% of older people use loudspeakers more often than directly to the ear. No numbers could be found for Germany and Austria (Tenzer, 2020).

Whatsapp is the most used messaging app in German-speaking countries. It is used by over 80% of smartphone users. In relation to other

messaging services, Facebook comes closest with a usage rate of ca. 30%. (Statista, 2024a, 2024b, 2024c) So, WhatsApp is described as the most important application for the elderly. The app is used to maintain social contacts and to send and receive pictures (Roth-Ebner and Oggolder, 2023; Amann-Hechenberger et al., 2015). Deil (2020) also describes that WhatsApp is the most used app. According to Deil, 81% of users in Germany use it, 88% in Austria and 89% in Switzerland. According to a survey, older people in Austria between the ages of 60 and 69 already received 8 messages per day in 2018 (Turulski, 2020).

Photos and videos are among the most used functions. 78% of Germans already used the function, 87% of Swiss, and even 92% of Austrians. Only 3% of Germans and 2% each of Austrians and Swiss do not want to use the function. The other percent want to use the functions or already use them a little (Deil, 2020). 33% of people aged 65 and over share pictures taken with their smartphone on the Internet (Tenzer, 2020). Tenzer (2020) also describes that only 5% of the elderly took selfies. The educational attainment of older people correlates with their ability to take photos. Only 82 percent of people aged 65 and over in Austria with a low level of education can take photos and then send them, while 88 percent of people with a high level of education can do so (Herrmann et al., 2021c).

The proportion of online users who use the Internet on a smartphone or tablet increased significantly from 31% to 68% between 2014 and 2020 in Swiss. The majority of Internet users are not only stationary on their computers but are also increasingly using mobile devices in parallel. (Seifert et al., 2020) In 2018, 26% of older Austrians already used a smartphone or tablet as a medium to access the Internet (Turulski, 2020). According to Eurostat, 89% of older people between the ages of 65 and 74 in Switzerland used a smartphone for Internet use in 2021. In Germany only 48% and in Austria 56% do so (Eurostat, 2022). Some older people use certain apps (e.g. WhatsApp) and don't even know that they are using the internet (Doh, 2020). Of those who also use the Internet on the move, 31.4% do so daily, 29.8% several times a week, 15.8% several times a month and 23.0% use it less frequently. The people who use the Internet on the move own a smartphone in 94.5% of cases (Seifert et al., 2020). 11% of the Onliners in Swiss shop online at least once a week using their smartphone. 16% shop 1 to 3 times a month, and 40% of older people shop less frequently than one time a month. 34% never shop online with their smartphone (Tenzer, 2020).

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The usage patterns of older people are changing in some cases, and some applications are used more frequently on mobile devices. These include chatting and video calling, and to some extent reading newspapers or using social networks. However, some applications are rarely used on a mobile device, including Internet banking, online services from public offices, online bookings, or the sale of goods because these are usually used with the classic web browser on the computer if they are used at all (Seifert et al., 2020).

E-mail services on the smartphone are used by 70% of Austrians, 66% of Swiss, and 61% of Germans elderly. The smartphone is used by 50% of Austrians to read messages, 49% in Switzerland and 45% in Germany. 60% of Austrians, 53% of Swiss, and 52% of Germans used their phones for navigation (Deil, 2020).

The majority has no interest in speech recognition. Thus, 48% of Germans, 46% of Austrians, and 39% of Swiss state that they have no interest in voice control on the smartphone. Nevertheless, 46% of Germans, 41% of Austrians, and 57% of Swiss used voice control at least a little. 6% of Germans and 4% each of Austrians and Swiss would like to use voice control (Deil, 2020).

The majority of older people in Germany and Austria have no interest in paying with their smartphones in supermarkets. In Switzerland, on the other hand, only 38% have no interest. In Switzerland, it is also used most frequently, by 54%. In Germany (28%) and Austria (27%), the user figures are more manageable. 8% in Switzerland and Germany and 7% in Austria would like to use the function (Deil, 2020).

Seventy-six percent of people between 60 and 69 in Germany can install apps and updates. For those over 70, it is only 55% (Herrmann et al., 2021c).

Specific applications, such as the use of social networks, are still only used by less than 30% of online users (Seifert et al., 2020). 36% of German elderly, 38% of Austrian elderly, and 39% of Swiss elderly want the latest technology in a smartphone. The Swiss (88%) want a handy smartphone the most. In Germany (77%) and Austria (81%), however, this wish is also represented. 27% in Germany want an emergency button on their smartphone to dial emergency contacts or the emergency number in the event of an emergency such as a fall. In Austria, it is 22% and only 20% in Swiss. Less interesting for older people in German-speaking countries is what the smartphone looks like. Only 7% of Germans, 7% of Swiss, and 10% of Austrians want their phone to look good. 31% of Germans, 28% of Swiss, and 25% of Austrians find the display

difficult to read. The phone's stability, on the other hand, seems to be more important. Thus, 59% of Germans, 54% of Austrians, and 49% of Swiss want a robust smartphone (Deil, 2020, S. 31). Smartphone operation should be intuitive and offer immediate added value for everyday life: Services that are a substitute for existing technologies, such as streaming services as a substitute for TV programming, are less likely to be adapted than complementary services that were not previously available, such as instant messaging services (Amann-Hechenberger et al., 2015).

The elderly are willing to spend an average of CHF 414 on their next smartphone. This is below the average for all age groups and the age group that is least willing to spend on its next smartphone. 14% of older people in Switzerland compare prices while shopping with their smartphone. 10% have asked friends via smartphone and advice while shopping. 16% have used their smartphone to research product information. 25% have benefited from discounts and promotions, and 29% have redeemed promotional codes or coupons (Tenzer, 2020).

Learning and inclusion approaches

Stubbe et al. (2019) see digital competencies as a prerequisite for social participation in the future. This is underlined by Seifert et al. (2020), who see that older people do not use current technical innovations to the same extent as younger people, even though they are becoming more and more relevant. Older generations in Germany often do not feel sufficiently informed and are unsure about using digital devices such as smartphones. In contrast to younger age groups, 79 percent feel confident or somewhat confident in using smartphones. Only 41 percent of 60 to 69-year-olds in Germany feel confident in using smartphones. In 2019 among the over-70s, only 36 percent felt safe using a smartphone (Stubbe et al., 2019).

The understanding of the technique is also very different. The understanding of Technology is more pronounced in males than in females. This is also known as the gender digital divide. In addition, the different educational backgrounds and access to Technology make the understanding of Technology among older people in Austria very heterogeneous. In addition, obstacles such as touchscreens and rapidly activated screen savers are difficult to understand for people who have grown up in an analog era (Amann-Hechenberger et al., 2015).

Older people have already adopted some technology, while others still need support. Nevertheless, older people are seen to learn new technologies such as the smartphone (Seifert & Charness, 2022) Germany's elderly as well as Austria's elderly 95% want to be able to operate their smartphones well.

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In Switzerland, it is 97% (Deil, 2020).

Overall, the motivation to purchase can often be described as certain functions of the smartphone and the fear of losing touch with new technological developments. In addition to favorable offers, recommendations from the personal environment play an important role in the purchase of a smartphone. Social pressure can also be another reason for purchasing a smartphone. In this case, relatives or friends urge the person concerned to buy a smartphone or introduce the subject to a smartphone as a gift (Amann-Hechenberger et al., 2015).

Older people who acquire a smartphone can be divided into two groups: Self-motivation (intrinsic motivation) and extrinsic motivation (motivation from outside). People who have acquired a smartphone for their reasons are more willing to learn and have greater problem-solving skills. Those who acquired a device out of extrinsic motivation experimented less with smartphones and tended to exhibit low motivation. Printed smartphone instructions could help here, but these are often unavailable or must be downloaded from a website. The seniors surveyed would like to see smartphone interactive device instruction (Amann-Hechenberger et al., 2015).

As smartphones as we know them have only been around for 15 years, they have only penetrated the market for 10 years and older people over the age of 65 were not among the first users, they often only learned to use smartphones when they were retired. Of course, this will change in the next few years. Nevertheless, this was the case at the time of the research work.

Often, smartphone use is not acquired until retirement age. This is due to the fact that smartphones as we know them have only been around for 15 years. Smartphones have only been on the market for 10 years, and older people over the age of 65 were not among the first users. This will of course change over the next few years. Nevertheless, this was the case at the time of the research. The support of younger family members plays a decisive role. The motive is often to stay in touch with family and friends (Roth-Ebner and Oggolder, 2023). If technologies and new media are used by relatives, the likelihood that older people will also use this technology increases. In addition, new media for which there are no substitutes - e-mails or social messengers - are more likely to be used than substitutes such as video portals or media libraries (Amann-Hechenberger et al., 2015). One of the motivations is digital participation. Use cases such as digital communication and social network usage, dealing with authorities, and smartphone payments are already occurring among Germany's

senior population (Stubbe et al., 2019). More than one-third of Swiss (35%) and Austrians (34%) feel that their smartphone keeps them on the ball. In contrast, only 24% of Germans feel that way (Deil, 2020).

On the other hand, the fear of technical problems demotivates users from learning new technologies such as the smartphone. In addition, people in Swiss who do not use smartphones often surround themselves with people who do not use smartphones either (Seifert et al., 2020).

Furthermore, there are user barriers in smartphone use for older people in Austria: One major user barrier is the unintuitive design of hardware and software; there is often a lack of conformity to expectations and inconsistency in the implementation of hardware and software. In addition, anglicisms often appear during smartphone use, which older people without prior knowledge of English have difficulty understanding (Amann-Hechenberger et al., 2015). Anderson and Perrin (2017) describe: *"elders are neither sure nor comfortable using computers and/or mobile devices, maybe because these devices are not adapted to their needs"*.

64% of the Swiss are annoyed by the small control panels on their smartphones. In Germany and Austria, the percentage is similarly high, at 56%. Also, 20% of older Germans are afraid of doing something wrong on their smartphones, 16% of Austrians, and only 10% of Swiss (Deil, 2020).

Older people find the effort of learning new devices more difficult than in recent years as the functionality and the associated complexity have increased significantly. This makes it more difficult to pick up older people and introduce them to the new technology. In 2009, 60% of older people felt this way, and in 2020 it will be 65% (Seifert et al., 2020). The cell phone is still more common among very old people than a smartphone because it is easier to use. Kapser et al. (2023) state that new technology is used when it is perceived as useful.

The German government's Eighth Report on Aging states that complex smartphone apps with low user-friendliness often create barriers to use that are too difficult for people who are not very tech-savvy, such as older people (Berner et al., 2020). The initial start-up of a new smartphone is a major hurdle for most seniors. The following problems were observed in Austria: (i) Many terms used during commissioning are incomprehensible, (ii) Open privacy settings are often selected out of ignorance, (iii) Operating the touchscreen is very difficult and must first be learned, (iv) Large range of functions overloaded, (v) No consistency in the operating system is a

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big hurdle, (vi) no understanding of basic usage concepts, (vii) App-Stores are not found due to misleading names e.g. PlayStore (Amann-Hechenberger et al., 2015).

Concrete tips and more information want 41% of Germans, 42% of Austrians, and 55% of Swiss. 57% of Austrians and Germans would like to see a simpler designation. However, only 44% of the Switzer. For example, 25% of Austrians, 25% of Swiss, and 36% of Germans describe that they sometimes find the smartphone difficult to use. Special training books are seen less as a solution and only 19% of Austrians, 18% of Germans, and 12% of Swiss want to use training books. 37% of Austrians, 38% of Swiss, and 33% of Germans would like to see more information about smartphone use via telephone, radio, and newspapers. Smartphone training is also less popular, with only 16% of Germans, 19% of Austrians, and 24% of Swiss wanting this type of training (Deil, 2020).

Furthermore, older people in Austria often do not understand the concept behind digital avoidance and its applications and functions. The resulting complexity, which cannot be replicated in contrast to other technical devices, often overwhelms seniors. Two main approaches can be identified here. Trial-and-Error method and proven procedures by imitation of the initial use of the smartphone are associated with the fear of breaking something or causing costs through ignorance. For this reason, older people use their smartphones cautiously. Nevertheless, many seniors can be observed to have the willingness to experiment and creativity in smartphone use. The vast majority of older users perverted before the first use of the smartphone to read a user manual. The desire for a user manual remains even during problems after the initial use phase (Amann-Hechenberger et al., 2015).

Especially in the first-use phase, it is important to avoid frustrating older people with smartphone use. Compared to younger people, older people are more quickly discouraged and often blame themselves for failure. Three different approaches could be identified when putting the smartphone into operation: (i) reading the user manual, (ii) having the operation of the smartphone explained, and (iii) learning by doing. Printed instructions for smartphones could help here, but these are often not available or have to be downloaded from a website. The seniors surveyed would like to see interactive device instructions for their smartphones (Amann-Hechenberger et al., 2015). There are also already solutions on the market. For example, there is a company that provides tutorial videos and animated instructions (Schramek & Stiel, 2020).

More than one-third of German speakers believe that the family can help older people learn how to use smartphones. This is stated by 33% of Germans, 37% of Austrians and 38% of Swiss. 15% of the Swiss, 19% of the Germans, and 23% of the people from Switzerland note that younger people are more understanding when it comes to technical problems. 4% of the elderly in all three countries see annoyed looks from younger people. One-quarter of older people in Switzerland and Austria and almost one-third (31%) of older people in Germany ask younger people for advice (Deil, 2020). In Swiss the social environment is to be used as a resource for the development of competence (Seifert et al., 2020).

Older people in Germany want to learn how to use smartphones self-determinedly. Various formal and informal forms are used for this purpose. Among other things, clubs and groups where older people can bring their smartphones and get help and explanations (eg. VHS/Adult education center and registered associations and local computer clubs). These associations usually charge a small fee or are organized on a voluntary basis; there is more on offer in cities than in the country. Events teach which apps are helpful and how to make relevant device settings. The aim is to enable older people to independently use all Internet-capable devices, such as smartphones, and to get to know and use functions such as email, Google search, Skype, Facebook, and other applications (Schramek & Stiel, 2020). These possibilities were also indexed by Jakob (2023): He concludes that the group sizes are usually between 5 and 15 participants and last between 2 and 6 hours. The main topics here are communication, photos, and app installation (ebd.) Also, according to Seifert et al. (2020), one way to include older people is to identify and activate volunteers to teach older people how to use smartphones. In addition, he sees the social environment as a decisive factor in building appropriate competencies. About half of the Austrians (52%) and Germans (50%) see a high level of support for the elderly in the population. In Switzerland, the percentage is as high as 60% (Deil, 2020). In a nutshell, older people in Austria are open to digitalization and smartphones (Jakob, 2023).

Health assessment and Corona-pandemic

It turns out that few health-related apps have been used so far in Switzerland. Fitness and health insurance apps are used most frequently (less than 20%). Only very rarely are apps used to remind people to take their medication. In general, the use of health apps is rather restrained. 48% of older people using health-related apps are willing to share the recorded doctor. Few people use health apps on their smartphones. Male online users are slightly more likely to use

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health insurance apps to measure vital signs than female offline users. Individuals aged 65 to 79 are more likely to use health apps than older individuals. Nevertheless, there are no significant differences between persons with a high subjective health assessment and persons with a low subjective health assessment - except for using apps to measure vital signs. Here, persons with a lower health status are more likely to use such apps (Seifert et al., 2020).

Genuine medical health apps such as pulse, blood pressure, or blood sugar measurement are used most in Switzerland with 14%, in Germany 9% of older people use them and in Austria only 7% (Deil, 2020).

According to Doh (2020), many elderly people collect large amounts of smartphone data about their physical activity and vital parameters such as blood pressure, body temperature, or heart rate. This was not necessarily confirmed for Germany in the survey by Deil (2020). Nevertheless, 24% in Germany used an app to collect health data. In Switzerland (47%) and in Austria (41%), however, considerably more older people collect health data via smartphone (ebd.). Also, Seifert et al. (2020) see only a few people use health apps on their smartphones. Nevertheless, potential can be seen.

Offline users were asked if they would ever try such health apps. The list of preferences differs somewhat from the actual usage figures for online users: fitness apps are less in demand among offline users, but health insurance apps and apps for medication monitoring are more popular. Nevertheless, the general interest in such health apps among offline users can be rated as reserved (Seifert et al., 2020).

Steinert (2017) concludes that neither sociodemographic data, such as age and gender, nor technology affinity have any effect on the use of health apps. So far, few older people share their health data from apps with doctors. In Germany and Austria, it is only 2% in Switzerland 3% (Deil, 2020). Older people with good health are more likely to use health apps that monitor vital signs. It is believed that this is to monitor and record chronic diseases (Seifert et al., 2020). For example, a simple reminder on the smartphone about taking medication can significantly increase compliance for older people (Steinert, 2017). The Eighth Report on Aging also describes that the smartphone can be used as a fall detector and emergency call aid for the elderly (Berner et al., 2020). The published work, Haeger et al. (2021) concludes that smartphone-based interventions in the health context can be implemented even in older age. Anyway, Steinert (2017) has found

that older people do not like the battery power and display size of the smartphone.

The Corona pandemic has contributed to the fact that 45% of Germans, 43% of Austrians, and 51% of Swiss have used their smartphone more often. During the coronavirus pandemic, 53% of Germans and 53% of Austrians would have felt deprived of the world without a smartphone. In Switzerland, 43% would have felt excluded. 51% of the older Swiss used their smartphone more frequently during the coronavirus pandemic. The older Swiss used the Corona Warn app the most, at 58%. Followed by the Germans with 51% and then the Austrians with 38%. Of the Austrians, most were undecided about whether to use a warning app (39%), while in Switzerland (22%) and Germany (25%) relatively few were undecided. Both 24% in Germany and 24% in Austria did not want to use the Corona warning app. In Switzerland, it was only 20% (Deil 2020, S. 23).

DISCUSSION

General and application usage

In German-speaking countries, the smartphone has arrived in the over-65 age group. As already known from previous studies, communication, and social participation are among the most important elements of smartphone use. Therefore, it is hardly surprising that, according to Deil (2020), over 80% of people in German-speaking countries use WhatsApp, and over 60% of older people use email on their smartphones.

However, in some areas, such as online banking or news gathering, older people avoid classic or longer-established tools like the computer. Older people are largely only proficient in the basic functions of their smartphones, such as making phone calls, writing text messages, and using social instant messaging services (Choudrie et al., 2020).

The studies identified a group of older smartphone users and a group of older smartphone (non-)users in Germany, Austria, and Switzerland. In the same way, existing research findings can also be used to classify the offline users and online users already known in the literature.

As already published in the literature, it could be confirmed that the social environment is decisive for smartphone use. If technologies and new media are used by relatives, the likelihood that older people will also use this technology increases. In addition, new media for which no substitutes - emails or social messengers - are more likely to be used than substitutes such as video portals or media libraries (Amann-Hechenberger et al., 2015; Leburu et al., 2018). This can be explained by the mobile phone technology acceptance model, MoPTAM. As described in the model,

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demographic, socioeconomic, and personal factors decide whether the smartphone is used.

One major user barrier is the unintuitive design of hardware and software; there is often a lack of conformity to expectations and inconsistency in the implementation of hardware and software. In addition, anglicisms often appear during smartphone use, which older people without prior knowledge of English have difficulty understanding. *"Elders are neither sure nor comfortable using computers and/or mobile devices, maybe because these devices are not adapted to their needs"* (Amann-Hechenberger et al., 2015). Based on this trend, it becomes clear that support and courses for introducing the Internet today should include stationary and mobile applications (Pfeßmar, 2018; Seifert et al., 2020; Seifert & Schelling, 2015).

Learning and inclusion approaches

The smartphone is described in the literature as an element of digital inclusion and participation. In German-speaking countries, for example, various areas have already been digitized or will be digitized in the coming years. In order not to exclude older people, there are different approaches and views in German-speaking countries. One approach is to support older people with offers of help and to make it easier for them to learn new technologies. Austria speaks of technology ambassadors - young people who communicate technology to older people. Overall, in the literature on people over 65, the personal environment is a key factor in digital inclusion. Hauke et al. (2020) describe that older people also want to learn about Technology.

Therefore, a technology ambassador is a sensible way to integrate older people into a new digital world and thus ensure digital participation. In addition, however, thought should also be given to how older people who do not own a smartphone could be digitally integrated and which socio-personal factors could be changed to encourage older non-smartphone users to use a smartphone or to enable functions that are available on a smartphone to be used on a conventional cell phone. For example, years ago there were projects to expand the NFC functions available in SIM cards and enable payments with the card or ID card. Thus, for example, a payment function could be retrofitted to a classic phone. In addition, modern services such as WhatsApp could lead to better integration of older people through age-appropriate solutions and, if necessary, legal regulations such as the EU Digital Markets Act (DMA), which obliges major messenger services to be interoperable from 2024.

Formal smartphone training is rising, but older people in German-speaking countries prefer informal learning opportunities. Overall, the willingness to provide support is rated highly by over 50%. Only one-fifth of the over-65s in German-speaking countries feel that younger people have little patience regarding support.

It would also be a good idea to establish alternative platforms and formats, such as a TV program or radio program that deliberately addresses older people and shows tricks and tips with the smartphone.

From the results, it can be deduced that the focus should be on an offer that is as low-threshold as possible since the people who do not use smartphones usually have a rather low level of education and low income.

Leonard and Hebblethwaite (2017) conclude that lack of knowledge also plays a critical role in smartphone use. The studies found that there is often a lack of self-confidence and fear of technology. This can also be found in international studies. Vaportzis et al. (2017) stated, "the majority of participants lacked confidence in their own abilities to use a tablet" (Vaportzis et al., 2017). This problem does not seem to occur in German-speaking countries because, according to Deil (2020), over 80% of older people say their smartphone skills are good or very good.

However, this is only a subjective assessment by the respondents in the study. Therefore, this value can rather be interpreted as an indicator of satisfaction, since older people are often not familiar with the full scope of the smartphone's possibilities. This can quickly lead to a BIAS because if the function is not known, it cannot be missed.

Smartphone operation should be intuitive and offer immediate added value for everyday life: Services that are a substitute for existing technologies, such as streaming services as a substitute for TV programming, are less likely to be adopted than complementary services that were not previously available, such as instant messaging services (Amann-Hechenberger et al., 2015). Nevertheless, the study by Vaportzis et al. (2018) shows that self-confidence can certainly be strengthened and the use of mobile devices made attractive (Vaportzis et al., 2018). Hauk, Hüffmeier, & Krumm (2018) also conclude that using new Technology, such as smartphones, strongly depends on usability (Hauk et al., 2018).

The studies showed that older people would often like to use smartphones to stay on the ball. However, it often turns out that the connection and software updates are a condition and make it difficult to cope. Thus, it is hardly surprising

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that Apple still offers a smartphone with the traditional home button and can thus pick up older smartphone users well. Android smartphones, on the other hand, often have different condition concepts that can confuse older smartphone users. For example, the condition concepts between Android 7 and Android 14 are not necessarily comprehensible. Android often has the advantage of a uniform back button. It cannot be said whether iOS or Android is a better operating system for older people. Nevertheless, it can be stated that continuity in the operating system helps older people to use the smartphone more comfortably and thus to include it better.

However, the group of older smartphone users is heterogeneous. This is because of the social environment, level of education, income, and influence usage. In addition, there is the factor of interest. This is due to individual Technology and educational experiences (Amann-Hechenberger et al., 2015; Busch et al., 2021; Choudrie et al., 2017; Delello & McWhorter, 2017).

Health assessment and Corona-pandemic

The elderly who use a smartphone are often willing to collect health data. There are already older people who share this data with their doctors. Depending on the clinical picture, there are already health areas that are digitalized start (e.g., insulin or diabetes Mellitus). In the literature, studies are already known that used the smartphone as a recording instrument.

Furthermore, smartphone manufacturers are developing increasingly in the direction of the health area, including case recognition and health documentation. The general trend is towards health data. Apple and Google have implemented apps for collecting health data in their iOS and Android operating systems, making it increasingly easy for patients and doctors to exchange information. In addition, one sees developments in the German language area, which prefers a digitalization of health data.

However, no data can be collected with a smartphone, so other products such as smart scales, smart blood pressure monitors, or smartwatches are often used to collect well-founded health data. Some chronic diseases such as diabetes can be monitored with IOT devices.

Often the smartphone acts as a gatekeeper for wearable and health devices and thus becomes a gatekeeper for people who do not use smartphones. Even though older people tend to be more critical of smartphone data collection in the literature, it is important to educate them. Often, older people are not sufficiently aware of the functions of their smartphones, which means

that data can be collected unknowingly.

Political and health system developments such as the electronic health record or the e-prescription facilitate health organization but are often not used by older people - due to lack of knowledge - to the extent possible. The Corona pandemic and the associated Corona warning app demonstrated this. According to surveys, the intended use was less than 50%; in Germany, only 26% of older people with smartphones installed the Corona warning app. During the Corona pandemic, a difference in smartphone use was observed. Older people in German-speaking countries use smartphones more often and take advantage of new functions. Not least because of the possibility of escaping social isolation and staying in contact with relatives.

Because older people are supposed to be open to these new functions and sociological factors seem to have a small influence, a very large potential is also seen in this area. Elderly people could benefit massively from the functions. In addition, older people should be open to using these functions.

Due to the access and license costs, the researcher concentrated on the databases described in the Methodology section and used all publications available there for this study. As not enough quantitative data was available, the results found are not representative. However, they form the basis for further research in this area. Due to limited financial resources, no further databases could be searched. In addition, publication bias represents a possible bias in the results, as more positive results tend to be published. Furthermore, it is possible that new results may have emerged after the study was completed that could not be taken into account in this study.

CONCLUSION

"The smartphone has largely replaced the classic cell phone" and has become very widespread among older people in German-speaking countries and is a key factor in the digital inclusion of older people. It is a medium that allows older people to participate in society and integrates them into current events (Berner et al., 2020; Müllegger, 2021; Seeberger & Pallauf, 2022, p. 43).

In a comparison between the countries Germany, Austria, and Switzerland, most elderly people in Switzerland own a smartphone and use the most functions of the smartphone. Through the literature search, it could not be clarified why Switzerland has the fitter smartphone users. It is assumed that this is due to the fact that the infrastructure in Switzerland is one of the best developed and there is more support from younger

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people. However, the data found for Austria and Germany are not as conclusive as the study by Seifert, which was conducted for the third time. There is still a need for research here.

The vast majority of older people are interested in learning new digital skills, such as the smartphone. However, the social environment, the level of education, and income are decisive for smartphone use. Informational and educational offers are preferred to formal offers.

Health applications and the associated wearables and eHealth services have great potential among older people. However, the smartphone often acts as a gatekeeper, making it difficult for older people to use. During the Corona pandemic, smartphone was discovered more frequently and for a new application by more than one-third of the elderly. Thus, it can be assumed that concealment and smartphone use increased again in the age group due to the Corona pandemic.

Nevertheless, it can be concluded that not all older people over the age of 60 can be won over for smartphone use since a certain degree of intrinsic or extrinsic motivation must be present. As Pallauf et al. describe, older people "*had to deal with technical innovations in their previous life*" (Pallauf et al., 2018). On the other hand, Franz Müntefering, Chairman of Bundearbeitsgemeinschaft der Seniorenorganisationen, says, "Older people have the right to be very reserved or dismissive" (Müntefering et al., 2020). He mentions as an example that driving a car and watching television is not used by everyone in his age group.

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Future research could look at which factors are responsible for the fact that older people in Switzerland use smartphones more than in Germany and Austria. As a result, the study comes up with eleven theses: The target group is very heterogeneous in terms of attitudes, experiences, interests, needs, and consumer behavior. The motivation of the individual differs strongly. There are age-related limitations and impairments that become apparent depending on the individual ageing process. Particular attention is drawn to the impairment of the hands and vision (color and contrast perception). As well as cognitive changes and sense of hearing (Amann-Hechenberger et al., 2015).

There are user barriers in smartphone use for older people: One major user barrier is the un-intuitive design of hardware and software; there is often a lack of conformity to expectations and inconsistency in the implementation of hardware and software. In addition, anglicisms often appear during smartphone use, which older people without prior knowledge of English have difficulty understanding. Anderson and Perrin (2017) describe: "elders are neither sure nor comfortable using computers and/or mobile devices, maybe because these devices are not adapted to their needs". (Amann-Hechenberger et al., 2015) On the one hand, it is assumed that this is due to the expansion of the wireless network in Switzerland, as this is financed differently than in Germany and Austria. It could also be that Swiss socio-economic and topographical factors favor the purchase and use of smartphones in Switzerland.

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