# “Alexa, start Get Well Safely”

## Development of a learning video and a smart speech assistant quiz and evaluation of its effect on patient empowerment prior to an unplanned inpatient stay

Master Thesis

For attainment of the academic degree of
**Master of Science in Engineering (MSc)**

in the Master Programme Digital Healthcare
at St. Pölten University of Applied Sciences

by
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St. Pölten, 21.05.2022

# Declaration

I declare that I have developed and written the enclosed Master Thesis completely by myself and have not used sources or means without declaration in the text. Any thoughts from others or literal quotations are clearly marked. This work was not used in the same or in a similar version to achieve an academic grading or is being published elsewhere.

21.05.2022

Place, Date

Signature

# Preface

At this point I would like to thank all those who motivated and supported me in the preparation of this master thesis.

First, I would like to thank the whole MDH-team but also my colleagues for always being there whenever a question came up.

Special thank goes to the advisor of my master thesis, FH-Prof. Andreas Jakl, MSc, who encouraged me to deal critically with the chosen topic and gave me a lot of valuable help in the preparation of the work.

My boss, DI Veronika Gsöls, MPH, has inspired me in many ways. Thank you most of all for your valuable inputs and for putting up with my occasional grumpiness.

In addition, my thanks also go to my husband Michael, who patiently endured and supported my moods and ups and downs throughout my studies - I can tell you: "It's done!".

Last but not least, I would like to thank my family, who gave me (lots of!) moral support and without whom the completion of this thesis would never have been possible.

Yours sincerely,

*Theresia*

# Abstract

The potential of patient's integration in their health processes, especially concerning unplanned/acute conditions of otherwise healthy people, is not exhausted. The research question was formulated and based on this potential: *To what extent can a learning video in combination with a smart speech assistant quiz improve patient empowerment prior to an unplanned inpatient stay (due to a non-chronical disease)?* To answer that question, a systematic literature review was conducted on the topics of patient empowerment as well as the technical factors of the thesis: the preparation of a valuable learning video and smart speech assistant quiz. A pre- and a post-intervention questionnaire were developed and handed out to 32 participants. Both contained 18 statements to determine a patient empowerment score (answered based on a five-point Likert scale). Participants were asked to fill out the pre-intervention questionnaire first, then watch the learning video and do the smart speech assistant quiz as often as possible with a minimum of once in a time span of two-weeks, before filling out the post-intervention questionnaire. Both, the video and quiz, contained general facts and questions about patient empowerment as well as patient safety tips, conveyed using "example"-patients. All participants were reminded twice to (re-)do and (re-)watch the video and quiz.

The patient empowerment score was calculated using the respondents' mean response (on the five-point Likert scale) across all statements. The higher the score, the higher the patient empowerment level of the respective person (minimum 1, maximum 5). With an average pre-intervention patient empowerment score of 3.7 and an average post-intervention patient empowerment score of 4.3 (= a plus of 0.6), a Wilcoxon Signed-Rank test showed that the hypothesis (h1) that the intervention does have an impact can be confirmed. H0 (= no difference pre- vs. post the intervention) was rejected ($p < 0.001$). Cohen's d was calculated as well – the effect size being high with $d = 0.9$. There are several limitations to the study and further (field) studies would be needed. Whether e.g., the measured increase in the patient empowerment levels applies to "real life" and if the intervention causes long term effects that outlast the two-week survey period cannot be determined. The literature review and results show that the full potential of improving patient empowerment levels using technology such as video and interactive audio formats is not expired. Further research and (technical) developments will hopefully continue to contribute to increasing health outcomes by (further) empowering patients. Meanwhile, the role of health-professionals and policymakers should not be forgotten as they too are part of the patient empowerment process.

# Kurzfassung

Das Potenzial PatientInnen in ihre Behandlung und Genesung einzubinden, insbesondere betreffend ungeplante/akute Zustände ansonsten gesunder Menschen, ist nicht ausgeschöpft. Aufbauend darauf wurde folgende Forschungsfrage formuliert: *Inwieweit kann ein Lernvideo in Kombination mit einem Smart-Speech-Assistenten-Quiz das Patienten-Empowerment vor einem ungeplanten stationären Aufenthalt (aufgrund einer nicht chronischen Erkrankung) verbessern?* Um diese Frage zu beantworten, wurde eine systematische Literaturrecherche zu den Themen Patienten-Empowerment sowie den technischen Faktoren der Masterarbeit durchgeführt: die Erstellung eines geeigneten Lernvideos und eines Smart Speech Assistant Quiz. Ein Prä- und ein Postinterventionsfragebogen wurden entwickelt und an 32 TeilnehmerInnen verteilt. Beide enthielten 18 Aussagen, um den Patienten-Empowerment-Score zu bestimmen (zu beantworten auf einer Fünf-Punkte-Likert-Skala). Die TeilnehmerInnen wurden gebeten, den Präinterventionsfragebogen auszufüllen, sich das Lernvideo anzusehen und das Smart Speech Assistant Quiz zu machen, beides so oft wie möglich, aber mindestens einmal in einem Zeitraum von zwei Wochen. Danach wurde der Postinterventionsfragebogen verteilt. Sowohl das Video als auch das Quiz enthielten allgemeine Fakten und Fragen zum Patient-Empowerment sowie Tipps zur Patientensicherheit, die anhand von „Beispiel"-Patienten vermittelt wurden. Alle TeilnehmerInnen wurden zweimal daran erinnert, das Video und Quiz (erneut) zu machen und (erneut) anzusehen.

Der Patient-Empowerment Score wurde anhand der Antworten der Befragten (auf der fünfstufigen Likert-Skala) über alle Aussagen hinweg berechnet (Mittelwert). Je höher die Punktzahl, desto höher das Patienten-Empowerment-Level der jeweiligen Person (Minimum 1, Maximum 5). Mit einem durchschnittlichen Patienten-Empowerment-Score vor der Intervention von 3,7 und einem durchschnittlichen Patienten-Empowerment-Score nach der Intervention von 4,3 (= ein Plus von 0,6) zeigte ein Wilcoxon-Vorzeichen-Rang-Test, dass die Hypothese (h1), dass die Intervention eine Wirkung hat, bestätigt werden kann. H0 (= kein Unterschied prä- vs. postinterventionell) wurde verworfen ($p < 0{,}001$). Cohen's d wurde ebenfalls berechnet – die Effektgröße ist mit $d = 0{,}9$ hoch.

Es gibt mehrere Einschränkungen für die Studie und weitere (Feld-)Studien wären erforderlich. Ob z.B. die gemessene Steigerung des Patienten-Empowerments auf das „echte Leben" zutrifft und ob die Intervention Langzeiteffekte hervorruft, die den zweiwöchigen Erhebungszeitraum überdauern, lässt sich nicht feststellen. Die

Literaturrecherche und die Ergebnisse zeigen, dass das volle Potenzial zur Verbesserung des Patient-Empowerment durch den Einsatz von Technologien wie Video- und interaktiven Audioformaten noch nicht ausgeschöpft ist. Weitere Forschung und (technische) Entwicklungen werden hoffentlich weiterhin dazu beitragen, die Gesundheitsergebnisse zu verbessern, indem PatientInnen dadurch (weiter) gestärkt werden. In der Zwischenzeit sollte die Rolle von Angehörigen der Gesundheitsberufe und politischen Entscheidungsträgern nicht vergessen werden, da auch sie Teil des Patienten-Empowerment-Prozesses sind.

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# 1 Introduction

People often tend to fully trust their doctors, nurses, and other health experts. This is not necessarily a bad thing, except when patients are giving up their self-responsibility in the process. Health outcomes can be improved by focussing on patient empowerment [1], which means helping patients to gain control and to act concerning e.g., their medical treatment, recovery process and well-being. This master thesis focusses on addressing this public health issue by using technology.

## 1.1 Problem and Motivation

According to the Austrian Association of Social Insurance Agencies ("Österreichischer Hauptverband der Sozialversicherungsträger") [2], 245,000 incidents in hospitals per year result in patient harm, 6,800 in a patient's death.

Due to my position at the Health Agency of Lower Austria ("NÖ Landesgesundheitsagentur") I know that quality- and risk management gain more and more importance in the health care sector. There are many safety barriers in place to avoid incidents in hospitals. Surgical Safety Checklists, Critical Incident Reporting Systems, Morbidity and Mortality Conferences or systematic Complaint and Claims management contribute to increasing patient and employee safety. Experience and strategic focus show that most safety barriers concentrate on what health care providers can do to ensure the safety of their patients and employees. Patients, however, are often seen as passive receivers of health services, especially when it comes to temporary illnesses, injuries etc. Health policies mainly focus on long-term conditions [3]. Diabetes mellitus patients for example are very likely educated about their condition at some point [4] (which does not necessarily mean that they make use of that education [4], e.g., depending on their age [5]). There are many programs and initiatives focussing on the empowerment of patients with chronic diseases such as diabetes [5]–[7]. The contemporary issue is the fact that up to this point the full potential of patient's integration in their health and recovery processes, especially concerning unplanned/acute conditions of otherwise healthy people, is likely not exhausted: The literature research (see Chapter 2.1) showed that most initiatives focus on chronically sick patients, but patient empowerment

plays an important role in increasing *everyone's* personal health as the following chapters show. Strengthening a patient's empowerment can also contribute to public health by e.g., improving health outcomes [1].

## 1.2 Research Question and Hypothesis

The following research question will be answered:

To what extent can a learning video in combination with a smart speech assistant quiz improve patient empowerment prior to an unplanned inpatient stay (due to a non-chronical disease)?

The following hypothesis will be confirmed or refuted:

By providing a learning video with specific contents and a smart speech assistant quiz that helps to consolidate those contents, the patient empowerment prior to an unplanned inpatient stay (due to a non-chronical disease) can be significantly improved.

## 1.3 Method

A systematic literature review was conducted on the following topics, mainly to identify what content needs to be provided in the learning video as well as the smart speech assistant quiz and how to present it:

- Greatest safety risks for inpatients during their hospital stay and which of them can be influenced by the patients themselves
- Possibilities of patient empowerment before a hospital stay
- Possibilities to measure patient empowerment

In addition to the above, the systematic literature review included evidence about conveying, learning, and rehearsing health information using technology such as video and audio formats.

A learning video was designed by using simpleshow videomaker [8] and a neural voice from Amazon Polly [9].

A smart speech assistant quiz about patient empowerment and patient safety was created using Voiceflow [10] and the Alexa Skills Kit [11].

In the last step two questionnaires were developed and provided before (pre) and after (post) the intervention. It is based on existing patient empowerment measures that were also identified in the literature review.

## 1.4 Goals

The purpose of this thesis was to determine whether a learning video in combination with a smart speech assistant quiz can improve patient empowerment prior to an unplanned inpatient stay, focusing on educating patients about how they can actively contribute concerning their recovery and safety. The focus being on unplanned inpatient stays caused by non-chronical conditions.

The aim being not to mistrust and control the work of health experts, who undoubtedly work to the best of their knowledge. No one deliberately makes mistakes, but it is a fact that mistakes happen. To detect these mistakes before they reach patients is the main goal of risk and quality managers. As explained above, many safety barriers are in place already. Those barriers are constantly improved to prevent and increase the chance of early detection and correction of mistakes. Patients need to take an active part in achieving this goal.

The idea of this master thesis was to add to the efforts that have already been made on the subject. By developing a learning video for potential inpatients that explains possible risks in relation to a hospital stay as well as the importance of patients' active role in their recovery process, giving instructions on how to participate in it, patient empowerment should be promoted. The content presented in the learning video will be reinforced using a smart speech assistant that provides a learning quiz. In empowering patients like this, an additional safety barrier is built, the probability of patient harm due to an avoidable mistake shall be lowered and patients' engagement in their own recovery should be increased.

## 1.5 Structure of Thesis

This master thesis is structured as follows:

- Chapter 1 contains the description of the problem and motivation. The research question, hypothesis and goals are laid out as well as the used methods.
- Chapter 2 provides an overview of the most important terms in the context of this master thesis. The definition and measurements of patient empowerment are discussed. The terms "health literacy" and "health information"

are debated as well as the most important aspects of patient safety in connection with the research question. Chapter 2 also contains information about the technological factors of this thesis, including virtual (speech) assistants and skills and neural voices. In preparation of the planned intervention, facts about the learning and testing of contents were researched and included.

- Chapter 3 describes the contents of the learning video and smart speech assistant quiz as well as the questionnaires and how they were developed.
- Chapter 4 contains the implementation and evaluation of the intervention and questionnaires. The analysis and results are illustrated.
- In Chapter 5 covers the conclusion and discussion. The most important results are summarized and interpreted. Limitations and implications are debated.

# 2 Background and Related Work

Chapter two contains some theoretical background that provides a basis for the development of the planned intervention and related questionnaires. One part of the learning video and smart speech assistant quiz will contain general facts about patient empowerment (details see Chapter 3). Inter alia what patient empowerment encompasses and how it is defined will be discussed.

## 2.1 Patient Empowerment

There is no universal definition of patient empowerment, although most experts refer to it in the context of patients' ability to make informed decisions and to take control over health related life aspects [12].

According to the European Patients Forum (EPF) [13],

> "patient empowerment is a process that helps people gain control over their own lives and increases their capacity to act on issues that they themselves define as important."

Daruwalla et. al stated [14, p. 2]:

> "Empowerment is the ability for individuals to have a voice at the Table. It centres care around patients' preferences and increases their autonomy rather than their conformity."

In 2009 the WHO (World Health Organization) has identified and published four components being fundamental to the process of patient empowerment [15, p. 190]:

> "1) understanding by the patient of his/her role; 2) acquisition by patients of sufficient knowledge to be able to engage with their healthcare provider; 3) patient skills; and 4) the presence of a facilitating environment."

The European EMPATHiE (Empowering patients in the management of chronic diseases) Project [5] has analysed patient empowerment for chronically sick patients and developed a conceptual framework, addressing both patients and health experts, see Figure 1.

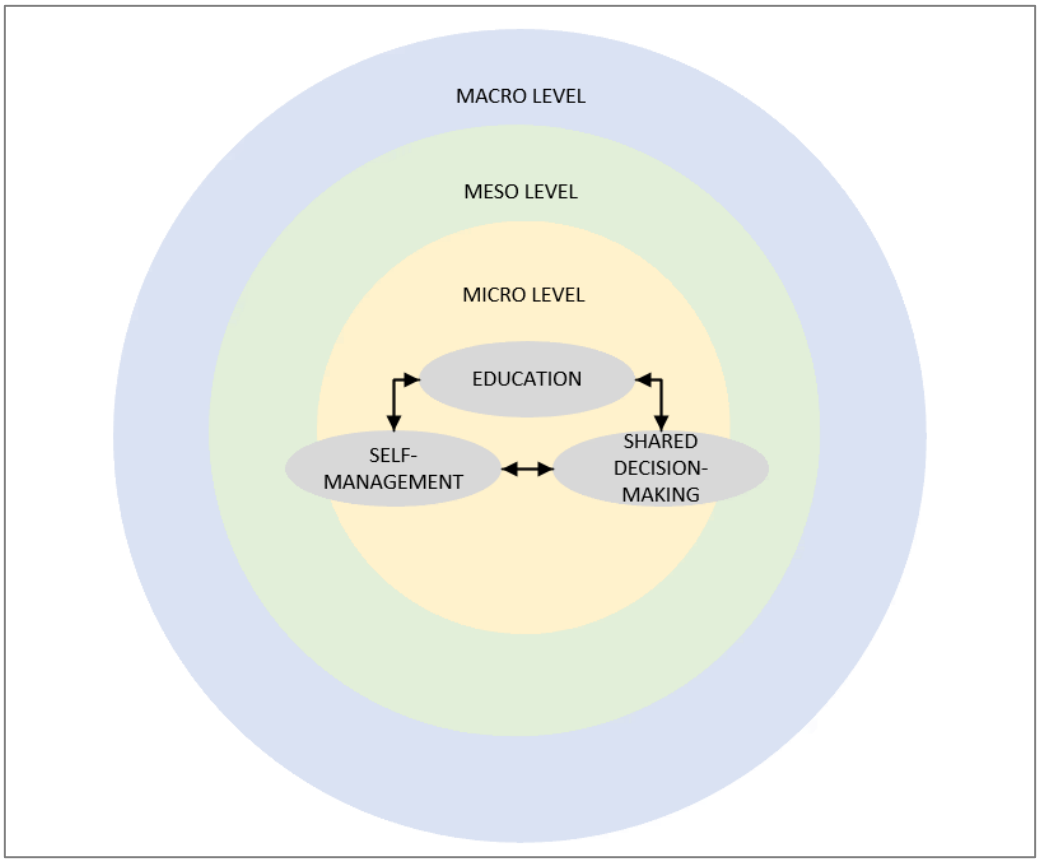



Image 1 Patient empowerment - conceptual framework, own representation based on the EMPATHiE report [5]

The micro level in the middle shows the three main dimensions of patient empowerment: education (interventions in the context of health literacy and information), shared-decision-making and self-management. The meso level refers to regional, local, or national implementation initiatives, while the macro level includes health policies [5].

“The Patients’ Charter on Patient Empowerment” lists ten principles [16], summarized in the following sentences (complete charter see Appendix A).

- Patients are more than their health condition, only empowered to the extent they wish. They must be seen as equal partners in health care.
- Moreover, health professionals need to promote health literacy and provide ongoing support to enhance patients’ self-care.
- The work of patient organizations and the promotion of equity and empowerment are vital.
- Patients have the right to be adequately informed about health topics, especially if it concerns their personal health.

- All patients should be supported equally.
- Patients have a unique perspective and therefore can identify blind spots, promoting effectiveness and efficiency in healthcare.
- What is not mentioned in the charter, but stressed by other experts [17], is patients' contribution to their own safety.

The charter's principles have been transformed into a "roadmap for action" [18]. The roadmap is derived from the principals, each point complementary to the others. It addresses policy makers and health professionals, urging them to inter alia focus on adequate health literacy and information but also technology driven solutions.

As stated before there is plenty literature discussing patient empowerment interventions targeting patients with chronic diseases (see Chapter 1.1) and comparatively little literature focused on complex patients, professionals [6], but also "ordinary" otherwise healthy people (meaning citizens who are not chronically sick). These still must deal with health problems from time to time (colds, wounds, broken legs, hip/knee replacement, vaccinations etc.). Admissions to a hospital can become necessary at any time. Therefore, speaking of empowerment, the EPF [18] states that acute or short time patients should not be disregarded. "(…) no-one should be considered "beyond" empowerment (...)". Another important fact to consider is that some patients might not (always) be interested in e.g., shared-decision-making and rather leave all treatment decisions to health professionals. Not every patient can or wants to be empowered [12].

In the following chapter it is discussed how patient empowerment can be measured, this mainly serves to provide a basis for the development of the planned questionnaire (see Chapter 3.3).

### 2.1.1 Measuring Patient Empowerment

As noted, there is no universal definition of patient empowerment (see Chapter 2.1). McAllister et al. [12] pointed out that different approaches of measuring patient empowerment exist, based on which construct is chosen. Taking that into account, comparing results of existing research is problematic as well. Some experts consider patient empowerment as a health outcome, the WHO and EPF inter alia see it as a process (see Chapter Patient Empowerment2.1), some say it is both, as McAllister et al. describe.

In a systematic review by Barr et al. [19] it is shown that many measures include one or more of the following variables: patients' state, experience and capacities; behaviour and action; self-determination; skills to determine the level of patient

empowerment. McAllister et al. [12] found out that some trials measure e.g., self-efficacy, health outcomes, personal control, or activation levels (knowledge, skills etc.). They also state that these often do not (sufficiently) include all physical and psychosocial factors. Barr and his colleagues [19] also reviewed scales that measure collaboration, integration or activism and autonomy etc. Target groups differ as well, some measures were generic others condition specific. Questionnaires designed to quantify patient satisfaction are only partially suited to measure patient empowerment, as they do not take "true" health outcomes into account as McAllister et al. conclude [12].

Only a few questionnaires were identified by McAllister et al. [12] that *could* be suitable to measure patient empowerment, though none of them is widely accepted or largely effective. Some are generic, some specific as regards the health condition of the target group. According to Barr et al. [19] more research is necessary. They point out the lack of a universal definition of patient empowerment that is needed as a basis for a valid measure.

This leads to the conclusion that for measuring the effect of an intervention on a patient's empowerment, specific questionnaires must be designed based on one of the available definitions. At least for as long as there is no generally accepted definition and no "robust generic measure of patient empowerment" [12]. These should be based on earlier research with similar or comparable objectives.

For this master thesis the WHO's definition for patient empowerment (see Chapter 2.1) was chosen. Part of the questionnaires was developed based on different generic and condition specific measures that were modified and extended, details see Chapter 3.3.

### 2.1.2 Health Literacy

Due to its important role in the process of patient empowerment, the concept of health literacy must be discussed in detail. In addition to that, the planned intervention includes the presentation of health information. Subsequently, one focus of this master thesis will be on the fundamentals of health literacy and the presentation of (digital) health information. Of course, the other components of patient empowerment are not irrelevant. Self-management for example is another key element of patient empowerment, mainly mentioned in connection with chronically sick patients [18], [5]. A clear separation of all respective terms is not possible. Like self-management the concept of shared decision-making is deeply intertwined with a high level of health literacy, same as patient-centered healthcare and some other notions (self-awareness, self-efficacy, …) [6].

#### *2.1.2.1 What is Health Literacy?*

According to the WHO [20] health literacy empowers people to make good decisions concerning their health. A person with a certain health literacy level has the skills and self-confidence to switch from a passive to an active role. Health literate citizens take responsibility for their own health. They are enabled to adapt their lifestyle and personal situation meeting their individual health needs. Health literacy does not mean just being capable to read brochures and make appointments. Health literacy promotes fair, balanced cooperation between patients and health professionals. The motivation and ability to access, understand and use health information in a way that personal health is enhanced and maintained, is increased. The WHO [21] also points out that it is impossible to be completely health literate, as it is a continuous process and no one can do without help (e.g., in understanding health information) at some point in his/her life.

The EPF states [6, p. 8]:

> "Health literacy is a key aspect of empowerment. Although empowerment involves much more than becoming an educated/informed patient, the right information and resources are fundamental tools for empowerment."

The same could be stated vice versa [22] – a high level of health literacy does not automatically entail increased empowerment. As already noted in a previous chapter (2.1), not everyone who has the ability to participate also *wants* to participate. On the other hand – if a patient is highly motivated to take an active role, but lacks in terms of health literacy, things can become difficult and even dangerous. Vaccination refusals are just one of many examples.

In addition to the above, Schulz et al. point out that [22, p. 9]:

> "A psychologically empowered patient lacking adequate knowledge and judgment skills could well make dangerous choices. On the other hand, highly literate patients lacking in psychological empowerment may choose to be highly dependent on health professionals despite their apparent ability to make well-informed decisions for themselves."

According to the Austrian Ministry for Social Affairs [23], evidence shows a positive correlation between good health literacy and health. Lacking health literacy is a worldwide problem. It is reported that 56% of all Austrian citizens have insufficient health literacy. Westerlinck et al. [24] say: "Low health literacy is associated with low adherence to medication, poor health status, and increased health care costs." According to National Voices [25], it is also connected with a higher risk of hospitalization and health inequalities.

Several experts [26]–[28] describe the same three levels of health literacy:

1. Functional health literacy
2. Interactive health literacy
3. Critical health literacy

According to Colledge et al. [29, p. 448]: “All three levels are needed by an empowered patient, but functional health literacy is the foundational skill.”. Nutbeam [26] states that functional health literacy is defined as the ability to gain knowledge about risks and health services. Interactive health literacy means the capacity to develop skills that help taking an active role in the treatment process. People with critical health literacy are mostly resistant to economic and social adversity.

The European Health Literature Survey (HLS-EU) [30] included eight countries (Austria, Bulgaria, Germany[1], Greece, Ireland, Netherlands, Poland, and Spain). The data was collected in 2011, where a random sample of about 8,000 European citizens, aged 15 years and older was interviewed via a standardized questionnaire. Figure 1 shows the prevalence of limited health literacy among the mentioned countries.

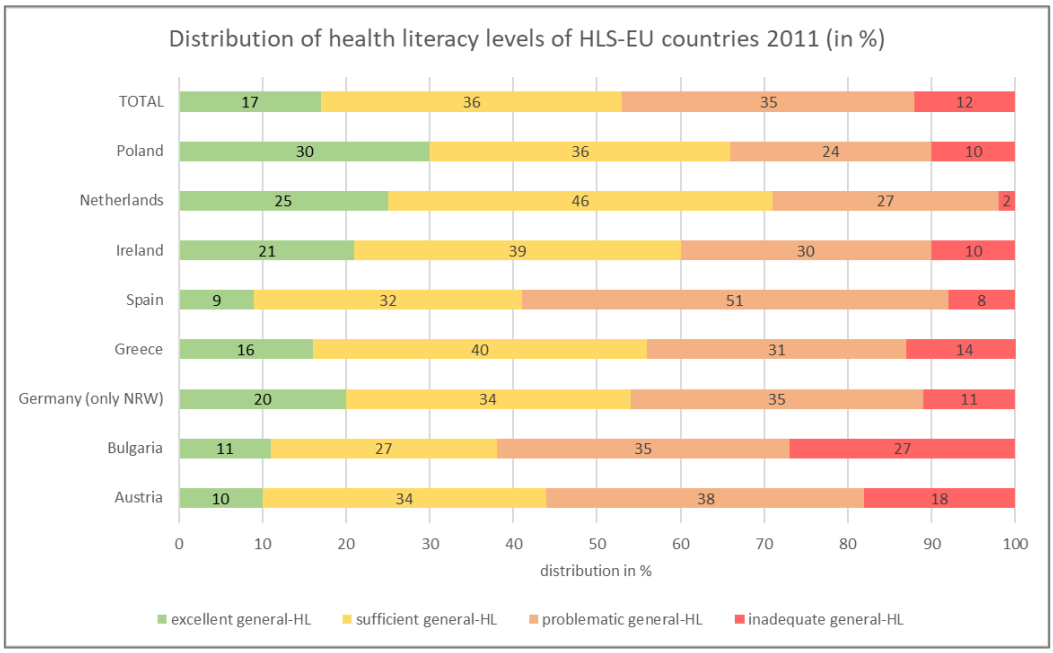



Figure 1 Percentage distribution of health literacy levels of HLS-EU countries 2011, own representation based on a diagram in a HLS_EU Consortium report [30]

[1] Only NRW (north rhine-westphalia)

18% percent of the Austrian respondents have inadequate health literacy, more than the total average of 12%. Only 44% of all Austrians have excellent (10%) or sufficient health literacy (34%), which also falls below the total numbers (53%: 17% with excellent and 36% with sufficient health literacy). Figure 1 shows that about half of the respondents (total) have problematic or inadequate health literacy, which indicates it as a major problem. Remarkable are the rather big differences between the countries. According to the study there are certain subpopulations more vulnerable to limited health literacy than others as Table 1 (page 20) shows [30].

In 2021 new data on health literacy was published [31], see Figure 2.

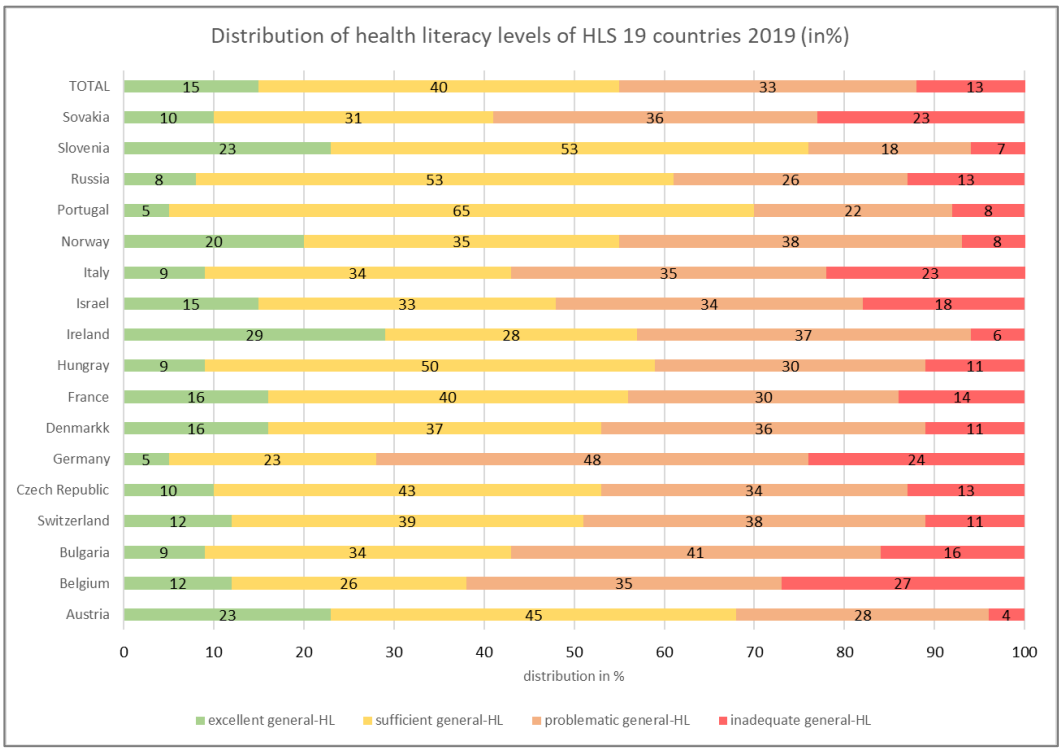



Figure 2 Percentage distribution of health literacy levels of HLS 19 countries 2019, own representation based a diagram in a HLS19 report [31] [2]

Figure 2 illustrates that there was an enhancement from 14% as regards inadequate health literacy levels in Austria. Also, the proportion of sufficient (23%) and excellent health literacy has shifted positively. Although it must be said that the HLS19 report [31] that included 17 countries (some from the first survey but also e.g., the Russian federation, Israel, and Switzerland) is only comparable to the previous data to a certain degree (due to methodological differences).

[2] Note: Numbers are rounded – sum is not always 100

To promote health literacy in Austria, the Austrian Plattform for Health Literacy ("Österreichische Plattform Gesundheitskompetenz" – ÖPGK) was founded as a direct consequence to the results of the HLS-EU study [32], [33]. The ÖPGKs five main goals are [33]:

1. Improving the quality of conversations between patients and health professionals
2. Improving of written and audio-visual health information
3. Empowering citizens and patients for health literacy
4. Supporting health literacy at an organizational level
5. Measuring health literacy

It can be assumed that the improvement of Austrian health literacy levels is partly due to the efforts of the ÖPGK. Another interesting aspect is that social status seems to have great impact on health literacy levels [30].

Table 1 Percentage of people with limited health literacy in vulnerable groups, countries and total, own representation based on a table in a HLS_EU Consortium report [30]

| INDICATOR | CATEGORY | in % | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Austria | Belgium | Germany | Greece | Spain | Ireland | Netherlands | Poland | Total |
| **Social Status** | very low | 79 | 80 | 59 | 80 | 84 | 64 | 50 | 60 | **74** |
| **Self-perceived health** | bad; Very bad | 86 | 83 | 57 | 83 | 78 | 56 | 41 | 71 | **73** |
| **Education** | level 0-1 | 63 | 77 | 58 | 77 | 74 | 51 | 41 | 100 | **68** |
| **Able to pay for medication** | very difficult | 78 | 81 | 40 | 66 | 55 | 60 | 58 | 62 | **67** |
| **Able to afford doctor** | fairly to very difficult | 76 | 80 | 56 | 61 | 68 | 56 | 42 | 75 | **67** |
| **Limited activities by health problems** | severly limited | 82 | 81 | 55 | 80 | 77 | 56 | 35 | 66 | **66** |
| **Monthly household income** | less than €800 | 38 | 84 | 56 | 70 | 70 | 59 | 38 | 62 | **66** |
| **Able to pay for medication** | fairly difficult | 67 | 72 | 66 | 60 | 72 | 51 | 36 | 68 | **64** |
| **Difficulty paying bills** | most of the time | 67 | 75 | 47 | 61 | 62 | 61 | 34 | 42 | **63** |
| **Long term illness** | yes more than one | 79 | 83 | 59 | 74 | 70 | 45 | 33 | 54 | **61** |
| **Age** | 76 or older | 73 | 75 | 54 | 72 | 71 | 46 | 29 | 65 | **61** |
| **Social status** | low | 60 | 62 | 64 | 57 | 59 | 53 | 48 | 64 | **60** |

Table 1 [30] illustrates that 74% respondents (see column "Total") with a "very low social status" have limited health literacy, followed by individuals with a "bad" to "very bad self-perceived health" (73%). Insufficient education and financial status also impact health literacy levels. Long term illnesses and age play a slightly smaller role. Still, about 61% of both subpopulations are affected by limited health literacy. Like in Figure 1 (page 18) and Figure 2 (page 19) some countries score noticeably better than others, suggesting the existence of a social gradient next to

the presence of specific vulnerable subpopulations [34]. To determine the causes for the national differences further research is required [34]. A detailed excursion in that direction would exceed the scope of this master thesis.

As noted above, being empowered includes a certain level of health-related knowledge. The above leads to the conclusion that is vital to design the learning video and smart speech assistant quiz in a way that promotes health literacy, by making it as accessible as possible. How this can be done will be discussed in Chapter 2.1.3. Since the planned learning video and smart speech assistant quiz as well as the online questionnaire are digital interventions, some specifics on digital health literacy are given in the next chapter (2.1.2.2)

#### *2.1.2.2 Digital Health Literacy*

According to Dunn et al. [33, p. 294]: “Digital health literacy is an extension of health literacy and uses the same operational definition, but in the context of technology.” Norman and Skinner [34, p. 2] state that the term eHealth literacy is often used synonymously and defines as the “the ability to seek, find, understand, and appraise health information from electronic sources and apply the knowledge gained to addressing or solving a health problem.” Xu et al. [37] published a paper on the association between eHealth literacy and satisfaction with patient’s well-being and shared decision making. A positive correlation between both variables and a high eHealth literacy level was found. Norman and Skinner [36] point out that like health literacy, digital health literacy is affected by a humans current state of health, educational background, and motivation but also by the technology used. They developed a model to show the context of eHealth literacy.

The model consists of six literacy types needed to optimize users’ eHealth experience [36]:

1. health literacy,
2. traditional literacy and numeracy,

both described in Chapter 2.1. In addition, the following types are listed:

3. computer literacy: the ability to solve problems by using a computer (dependent on the access to a computer)
4. media literacy: the capability of critical consideration of media content and context
5. science literacy: being able to understand scientific information and its goals, methods etc.
6. information literacy: knowing where and how to organize, find and access knowledge on a specific issue (offline and online)

A survey from 2020 [38] showed that about 13% (nine million) of the UK citizens have lacking digital skills, over 65% with internet access do not use digital tools to support their health and 8% are not connected at all. In Austria the situation is similar [39], 8% of the population never use the internet. In 2021, 93% Austrians had access to the internet [40]. 29% online shoppers stated to buy medication or dietary supplements on the internet. Of all respondents, 60% reported to have used the web as a source for health information, see Figure 3 below.

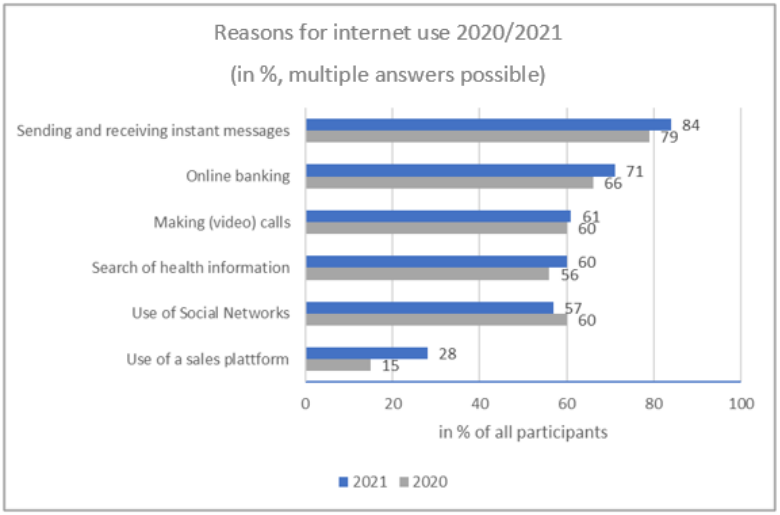



Figure 3 Reasons for internet use 2020/2021 (survey period of three months), own representation based on a publication by Statistik Austria [40] (translated from German)

Further evidence shows that mobile and wireless technologies can have a positive impact on health behavior and help avoiding acute and chronic diseases [41]. While digital health technology can facilitate the access to health information, improve health literacy and health education, it can also represent a barrier e.g., for people who cannot afford the necessary devices [24], [35], [42]. In their study about mobile health apps, Fu et al. [43] found several factors that contribute to digital health literacy including gender, annual income, internet experience, usage frequency of mobile health apps and screen size. It must always be kept in mind that digital technologies can only add to existing efforts but will never replace human interaction [44].

In addition to sufficient health literacy on the part of the patients, it is just as important to e.g., design the respective health information in an appropriate way. The following chapters provide an overview of this topic.

### 2.1.3 Health Information

Before going into detail about the design of good health information, some general facts about health information are provided. Health information is one of the most

widely used type of information available [45]. According to a survey done by the Austrian Health Barometer ("Gesundheitsbarometer") [45], 54% of the respondents stated to feel rather well informed, 18% said to feel rather poorly or poorly informed about health topics. Figure 4 shows that the internet is one of the most frequently used health information sources followed by general practitioners (GP), named by 55% and 45% of all interviewees while other sources like newspapers, television or books were mentioned by maximum 17%.

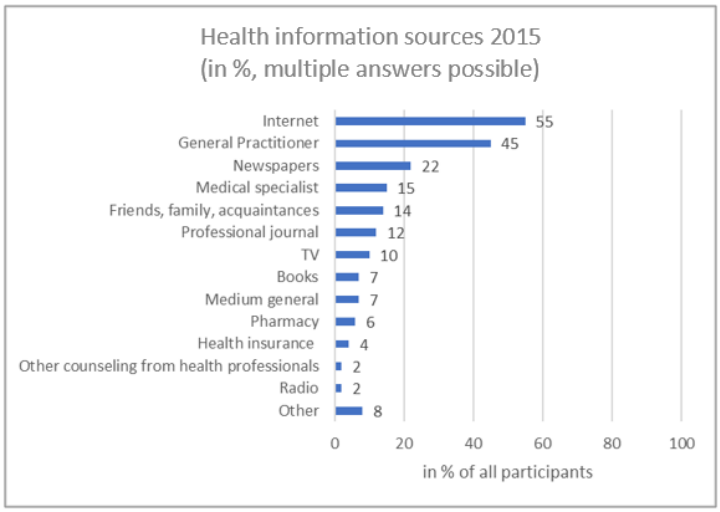



Figure 4 Health information sources (2015), own representation based on a diagram in the "Gesundheitsbarometer 2015" [46] (translated from German)

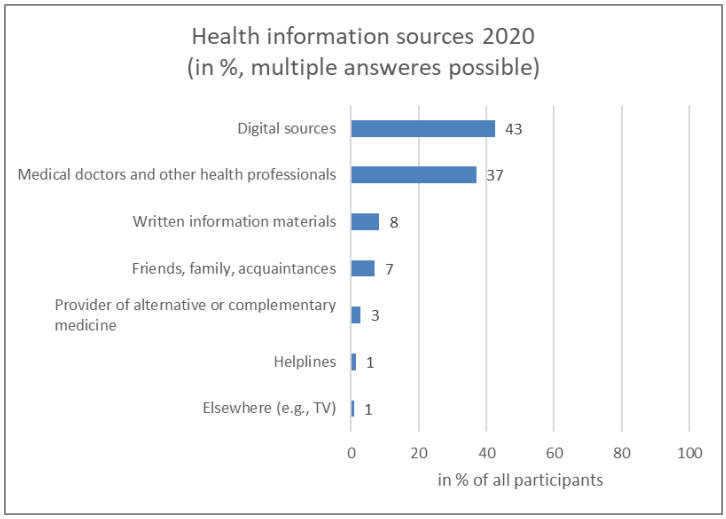



Figure 5 Health information sources (2020), own representation based on a diagram in the "Factsheet Österreichische Gesundheitskompetenz-Erhebung" [47] (translated from German)

Five years later in a survey about health literacy in Austria, similar results were found [47]. Nearly 43% stated to use digital sources to gather health information,

and 37% ask their GP or other health professionals for advice. Only ca. 8% gather information from printed media, see Figure 5.

The Austrian Health Barometer [46] also inquired about the level of trust people have in the information sources mentioned above. As Figure 6 indicates, GPs enjoy the highest confidence, 44% of all interviewees stated to particularly trust their GP while only 20% trust information gathered from the internet.

Interestingly, another Austrian study showed that 96% of all doctors hold health information materials but only 86% actively use it in consultations [45]. A detailed excursion in that direction would exceed the scope of this master thesis.

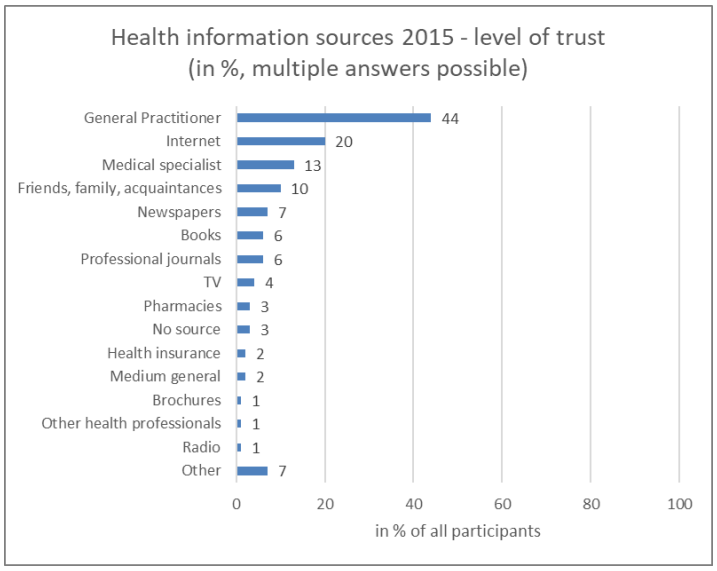



Figure 6 Health information sources – level of trust own representation based on a diagram in the “Gesundheitsbarometer 2015” [46] (translated from German)

As noted before, in addition to the availability of health information, its intelligibility is important: According to the PIAAC-survey [48] (Programme for the International Assessment of Adult Competencies), 17.1% of all Austrians aged between 16 to 65 years – about 970,000 people – have low reading skills. In the United Kingdom (UK) around 20% of all adults are functionally illiterate [49]. The OECD average is at 16.7% [48].These people can read and understand short texts at most. In the PIAAC-survey the tested persons were able to identify information in texts only if it was synonymously or equal to the information of the given example. People with low reading skills have great difficulty in understanding and gaining knowledge from longer texts with contradictory information.

The next chapter summarizes the most important facts about how “good” health information that is suitable for all citizens (whether they e.g., have good reading skills or not) is designed.

#### *2.1.3.1 "Good" Health Information*

A coherent and methodic approach aiming to present evidence based information in an understandable, transparent and unbiased way, is the basis of good health information [50].

Health information must meet the following criteria to fulfill its purpose [51]:

- Comprehensibility for ordinary people
- Independency (no overt or covert advertising)
- Target group orientation
- Gender-independency
- Reliability (evidence-based)

The chosen format of the information also plays an important role. Some target groups prefer comics or graphics, others find video or audio more appealing than written information [52]. Visual aids such as simple diagrams also promote accessibility [49].

Health information in plain and simple language leads to a better understanding of contents [51]. This also concerns people with good reading skills. The mentioned criteria apply to all formats: printed information (e.g., patient brochures), digital information (e.g., websites, apps) but also audio and video formats. Individualized information often is necessary (e.g., personal e-mails or discharge summaries), but the term of "good" health information mainly refers to contents for large target groups.

Next to the above criteria there are some principles to follow to create good health information [50] [53]:

- Identification of special information needs of the target group
- Systematic research, considering the problem of the target group, respecting age, ethnos, biological and social gender (except concerning gender-related disabilities e.g., prostate or uterus cancer)
- Science based selection of evidence and sources
- Unbiased, gender sensitive display of relevant outcomes concerning e.g., mortality, complications, risks, or health-related quality of life
- Appropriate and realistic presentation (as regards content and linguistic) of risks and uncertainties concerning the effectiveness of an intervention
- Omission or clear separation of presented outcomes and derived recommendations

- Consideration of current evidence when presenting numbers, risks, and probabilities
- Mentioning of possible conflicts of interest
- Transparency: content, presentation, authors, sources, publishers, fundings etc.

The Patient Information Forum (PIF) [54] founded in 1997, sponsored by the King´s Fund (an independent charitable health care organization in England [55]) published an evidence based review [49] dealing with the topic of how good health information should look like. It is pointed out (citing A. Coulter [56]) that insufficient information is one of the top causes of patient complaints in the health service. The problem not being the quantity but the quality of health information.

In the review [49] similar principles as those mentioned above are proposed. In addition, the requirement of developing health information in direct collaboration with patients is mentioned. Evidence indicates that patient narratives are experienced to be more tangible, relatable, memorable, comprehensible as well as lively and therefore could be used as a tool in health information. As researchers have not yet determined whether patient narratives can also bias decision making in terms of quality and outcome, the presentation of general facts is still vital. Patient narratives can only be considered as a possible addition to health information and should always be handled with care. The learning video that was developed for this master thesis also combines general facts about patient empowerment wrapped in examples of how patients can add to their own safety during a hospital stay (details see Chapter 3).

National Voices, a coalition of health care charities in England [56], also published an evidence-based review [25] on health care information. To promote the understandability of health information it is inter alia necessary to provide individualized information and education and to offer digital content. Table 2 summarizes measures effectuating patients' health knowledge, experience, and outcome.

Table 2 Measures effectuating patients' health knowledge, experience, and outcome (own representation based on a table in the National Voices report [25])

| **Improvement of knowledge** | **Improvement of experience** | **Improvement of health outcomes** |
|---|---|---|
| Individualized information<br>Printed and electronic information<br>Consultations with health professionals<br>Audio-recorded consultations<br>Education programs | Printed and electronic information<br>Telehealth<br>Digital interactive television<br>Social media<br>Active education programs | Individualized information, including minorities<br>Distinct information about medication<br>Telehealth<br>E-learning and online services<br>Group and single education |

The evidence on the effectiveness of printed and electronic information, telehealth, e-learning and online initiatives is especially strong [25]. Table 2 displays that health knowledge and outcomes are improved by individualized information, including information designed for minorities when it comes to health outcomes. Concerning experience, telehealth but also digital interactive television and the use of social media seem to have positive effects. Printed and electronic information both enhance experience and promote patients' knowledge. Clear information about medication has also proven helpful concerning the outcomes. Evidence shows that education programs have a positive impact on knowledge as well as on experience (active education programs were especially successful). Telehealth, e-learning, other online offerings and group and individual education also improved health outcomes. In order to promote patients' knowledge, consultations with health professionals or recordings of such, are effective.

As mentioned above, the quality of good health information has several dimensions that include correctness, topicality, completeness, intelligibility, gender-sensitivity, accessibility etc. It is important to point out that optimizing all dimensions is impossible and compromises are unavoidable [50]. What also needs to be considered is that – of course – "bad" health information exists and can be harmful to citizens [57]. Based on a study [58], commissioned by the Bertelsmann Foundation on problematic health information, criteria were formulated that should help to classify dangerous health information. These criteria help to check the correctness, transparency, and effectiveness of health information. Poor health information is characterized as incorrect, one-sided, shortened and/or unobjective. It is dangerous when it causes actions that lead to physical, psychological or financial harm and/or if it causes a loss of trust in evidence-based medicine [59]. A detailed excursion in that direction would exceed the scope of this master thesis.

To facilitate the development of an adequate learning video and smart speech assistant skill, a closer look the characteristics of digital health information must be taken, see next Chapter 2.1.3.2.

### *2.1.3.2 Writing (Digital) Health Information*

A clear separation between the principles for digital and analog health information is impossible. Most criteria for "good" health information also apply to digital health information but there are a few additional things to keep in mind when presenting information using a screen or audio formats.

Research showed [49] that interactive content (videos, websites, audio recordings etc.) has positive effects on patients' comprehension and contentedness. Moreover, it often enables to make informed decisions.

The WHO [60] [44] officially recognized the importance and potential of information and communication technologies in improving patient engagement and empowerment. The use of digital health technology offers many possibilities concerning the presentation of health information [35]. It is often more dynamic and can be individualized easily.

The website "Health literacy online" [61] hosted by the U.S. Department of Health and Human Services, provides evidence-based tips for the design of digital health information. The guide gives recommendations e.g., on how to avoid literacy-related barriers such as using a small font size or not using bullet points for structuring the information. The aim of the guide is to help create content for every type of user, so that people with e.g., low literacy skills will not be disadvantaged. In the following an overview of these guidelines and suggestions on how to write digital health information is given, some also apply to printed information:

- Content needs to be simple, with few words to avoid overwhelming users
- Distractions must be avoided (too many links or icons)
- Important content should be placed in the center of the screen
- Presenting content on a mobile device (those are used more frequently than others) involves special requirements (smaller screens, smaller keyboard etc.)
- Users want to get "fast answers" to their problems: The given information needs to be to the point, viable, appealing, and concise
- A summary of the most important information should be given (ideally on top)
- Interactive tools, checklists or chat functions help engaging users

- Using positive wording motivates further ("your taste will improve after you quit smoking" instead of "smoking impairs your sense of taste")
    - Telling people what to do is more effective than telling them what *not* to do ("always use a seatbelt when driving" instead of "never drive without using a seatbelt")
- Passive voice should be avoided ("you need to get your blood tested to …" instead of "a blood sample is needed to …")
- Unavoidable complex terms must be explained
- Examples help understanding unfamiliar concepts
- Behavior tips must be explained, understood, and split into small steps to stay manageable

There are also some recommendations on how to display and organize content on webpages [61]:

- Paragraphs must be kept short; bullet points and short lists help structuring content
- Using compelling headings increases clarity
- Font size should be at least at 12 pt. (point)
- No cluttering or too much white space
- Use of color to underline unavoidable links
- Accounting for accessibility (e.g., adequate contrast for visually impaired people)
- Labels should be precise and expressive
- Buttons and other clickable elements must be distinguishable
- Search functions can be challenging and therefore must be kept simple

To further engage users, the guideline suggests using video, audio, and other multimedia content. Interactivity and intuitive interfaces also contribute to a good user experience – quizzes, forms, graphics etc. must be tested in advance to ensure user friendliness [61].

In addition to the above, Fox [62] identified best practice recommendations for the development of interactive, computer-based patient education programs (ICBE), summarized below:

- Available technological possibilities should be utilized
- Chosen multimedia formats should promote and hold users' interest
- Voice-over and scripts should be used to increase understandability (e.g., for the visually impaired or people with limited literacy)

- Easy and multiple way access in a suitable environment must be guaranteed
- A question-answer-setting should be used to increase interaction
- Some extent of user control should be provided (concerning e.g., level of information detail)
- Healthcare providers must inter alia take interaction with existing interventions into account when providing ICBE programs

There are also some disadvantages to be mentioned: An article by Schmutz et al. [63] discusses possible adverse effects on nondisabled people when applying accessibility criteria. The study was conducted with nearly 130 nondisabled test persons who evaluated two different website versions – one with contents in "normal" language and one using plain and simple language, designed for people with low reading skills. On the one hand the easy-to-read language promoted the perception of content but extended the reading time, diminished content liking and lessened the intention to visit the website again. The authors suggest to carefully consider the specific user need of the addressed target groups when deciding if or which accessibility criteria to follow.

#### *2.1.3.3 Examples for (Digital) Health Information*

Three short examples have been selected to demonstrate how (digital) health information can be presented. The Upper Austrian website wobinichrichtig.at [64] aims to enhance people's orientation in the health care system, to raise awareness for structures, rules and processes to promote health literacy. It also addresses health professionals, inter alia trying to help them reduce conflicts, stress, and misunderstandings with their patients. Image 2 depicts how wobinichrichtig.at[3] informs about waiting time in hospitals (for presentation reasons sections on the top and on the bottom of the website were cut, full screenshot as well as English PDF-version see Appendix B.

[3] https://www.wobinichrichtig.at/cdscontent/?contentid=10007.856905&portal=wobinichrichtigportal

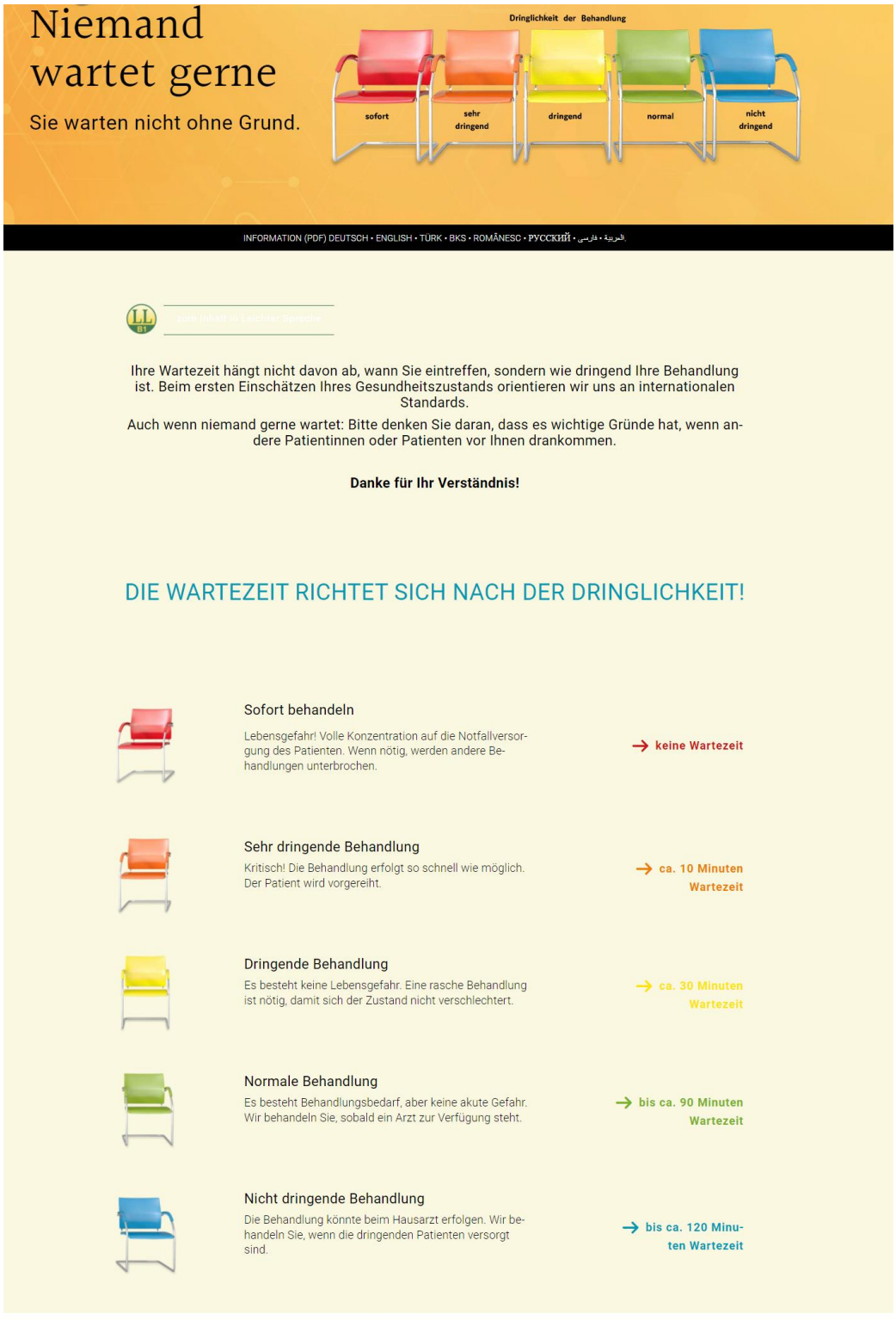



Image 2 Example for health information: Screenshot of wobinichrichtig.at [64], describing hospital waiting times according to severity of the treatment (whitespace removed for clarity)

Following some of the recommendations described in Chapter 2.1.3.2 the website uses short paragraphs and a compelling heading as well as simple language, avoiding complex terms. The important information is placed in the center of the screen. Different language options are offered (PDF downloads) as well as a clearly labeled button to switch to a website version with higher accessibility as regards wording. Visual aids (chairs in different colors) support an appealing presentation. Nevertheless, there is still room for improvement: the website is e.g., not gender-sensitive, only addressing men in the German version, the chosen font size is too small in some parts and some of the clickable objects do not work.

Another example was taken from gemeinsam-gut-entscheiden.at [65]. The "Choosing Wisely Austria" [66] is a collaboration of the Institute for General Practice and evidence-based Health Services ("Institut für Allgemeinmedizin und evidenzbasierte Versorgungsforschung"), the Medical University Graz ("Medizinische Universität Graz") and Cochrane Austria. Image 3 (page 33) shows the webpage[4] about the top gynecological recommendations for women (sections were cut out for representation purposes, the image would have been too small otherwise; entire webpage see Appendix B). The website displays graphics, which have been described as possible part of "good" health information in Chapter 2.1.3.1. It also provides links that are highlighted in a different color when mousing over. Otherwise, it is kept simple, avoiding too much white space and distractive icons. What must be pointed out is the mentioning of sponsors and stakeholders at the bottom of the website as well as the authors on the left. This aligns with the principle of transparency (see Chapter 2.1.3.1). The webpage lacks as regards phrasing: It contains several terms that are difficult to understand, e.g., "B-Streptokokken" (a type of bacteria) that are not explained. Furthermore, lots of passive language is used, which should be avoided according to research (see Chapter 2.1.3.2).

The last example is about cornea transplants (see Image 4, page 34), available on the NHS' website[5] [67]. On the top of the page, there is an overview for orientation. The website uses color-underlined links for navigation, is separated in small paragraphs and written in short sentences. Medical terms are explained, and risks displayed (not visible in the image). Moreover, a video with further information is provided as well as a "next" button for further information. One downside is that sponsors, authors, and sources are not mentioned. Details see image below (several sections were cut out for representation purposes, the image would have been too small otherwise, full screenshot see Appendix B).

[4] https://gemeinsam-gut-entscheiden.at/bereich/empfehlungen/gynaekologie/

[5] https://www.nhs.uk/conditions/cornea-transplant/

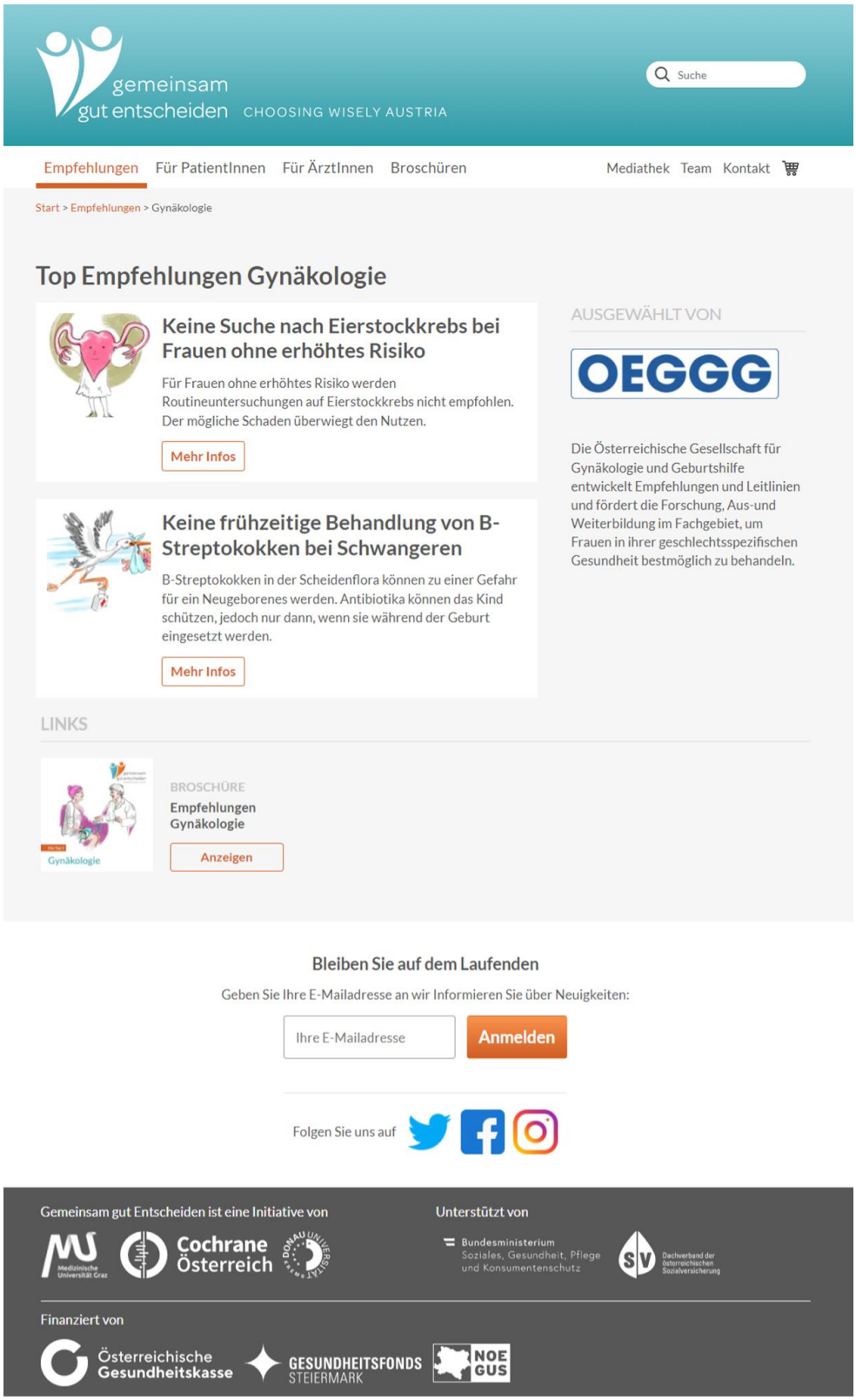
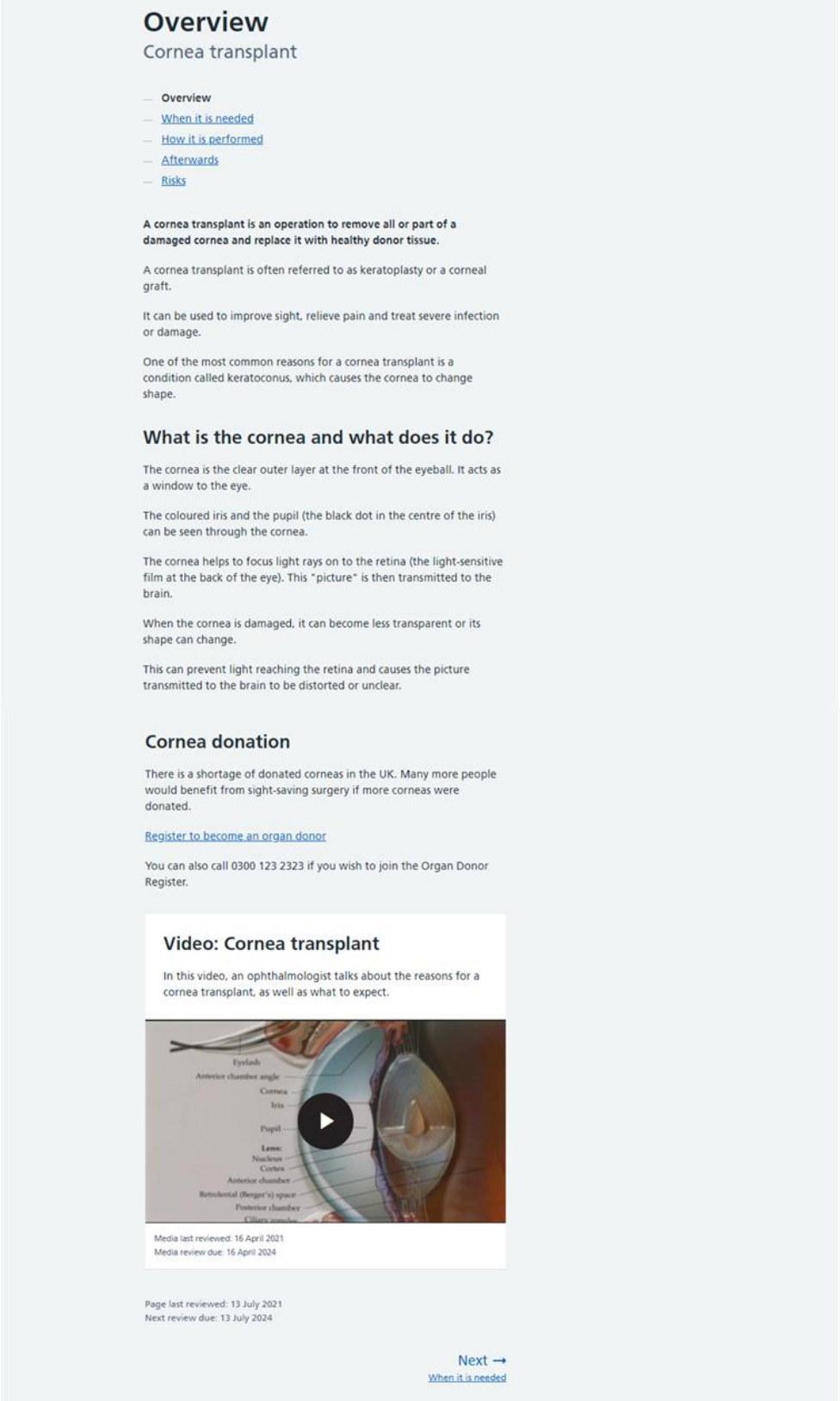



Image 3 Example for health information: gemeinsam-gut-entscheiden.at - Top gynecological recommendations [65] whitespace as well as a section in the middle removed for clarity



# Overview

## Cornea transplant

- Overview
- When it is needed
- How it is performed
- Afterwards
- Risks

**A cornea transplant is an operation to remove all or part of a damaged cornea and replace it with healthy donor tissue.**

A cornea transplant is often referred to as keratoplasty or a corneal graft.

It can be used to improve sight, relieve pain and treat severe infection or damage.

One of the most common reasons for a cornea transplant is a condition called keratoconus, which causes the cornea to change shape.

### What is the cornea and what does it do?

The cornea is the clear outer layer at the front of the eyeball. It acts as a window to the eye.

The coloured iris and the pupil (the black dot in the centre of the iris) can be seen through the cornea.

The cornea helps to focus light rays on to the retina (the light-sensitive film at the back of the eye). This "picture" is then transmitted to the brain.

When the cornea is damaged, it can become less transparent or its shape can change.

This can prevent light reaching the retina and causes the picture transmitted to the brain to be distorted or unclear.

### Cornea donation

There is a shortage of donated corneas in the UK. Many more people would benefit from sight-saving surgery if more corneas were donated.

Register to become an organ donor

You can also call 0300 123 2323 if you wish to join the Organ Donor Register.

### Video: Cornea transplant

In this video, an ophthalmologist talks about the reasons for a cornea transplant, as well as what to expect.



Media last reviewed: 16 April 2021
Media review due: 16 April 2024

Page last reviewed: 13 July 2021
Next review due: 13 July 2024

Next →
When it is needed

Image 4 Example for health information: NHS - cornea transplant [67] whitespace as well as a section in the middle removed for clarity

### *2.1.3.4 Health Information – Video and Audio Formats*

Since a learning video and a smart speech assistant quiz about patient empowerment and patient safety is planned, video and audio formats for transporting health information must be discussed in detail:

As mentioned above, video and audio formats can help people to understand health information. The WHO [68] proposed to consider audio and video content when producing health information. Offering audiovisual content has been identified as one of the characteristics of a health literate health care organization. Another factor is time. Experts [62] [69] point out that a lot of personnel resources are used for direct patient information and education, stressing multi-media content as a good alternative. Farrell et al. [70] define audiovisual content as follows: audio recordings, videos, computer programs, electronic presentations, and compact discs.

It has already been noted that even educated people often have difficulties in understanding complex health information. Fox [62] conducted a systematic review on the topic. It is stated that ICBE can help health care providers fulfilling the needs of special target groups (see Chapter 2.1.3.2). In most of the included studies about ICBE positive outcomes were observed. Well-designed and developed ICBE were reported to be more effective than or equally effective as direct instructions from a health professional. Further findings confirm a positive effect of ICBE use on patient satisfaction.

In 2000, Morgan et al. [71] conducted a randomized controlled trial analyzing the effects of an interactive video-based decision aid for heart disease patients. Results show an improved knowledge level and more autonomy as regards decision making for the intervention group. No differences were found concerning satisfaction with the decision-making process.

Recent research confirms earlier findings. A systematic review [70] of audio-visual interventions for informed consent for invasive procedures concludes that the use of audio-visual interventions for informed consent[6] increases patients' memory of the respective consultation content. No adverse effects on patient satisfaction or anxiety levels were reported. One advantage of these formats is that patients can consume the provided information any and multiple time(s) and discuss open questions with the health expert later.

[6] "Informed consent […] is the process whereby clinicians obtain permission from patients to perform invasive procedures on their behalf." [71, p. 21]

Another study [72] compared web-based interventions (some including interactive videos) to non-web-based interventions. The results show a better outcome for web-based interventions as regards to health-related knowledge, motivation to participate in the treatment process and better overall health status.

Combining text and audiovisual information improves satisfaction with intelligibility and attractiveness of a website [73]. But learning from visualizations supported by written information is less effective than learning from audiovisual content only (here = visual plus auditory information) [74]. This so-called “modality effect” is caused by the fact that the brain’s working memory can be overloaded faster if it has to process visual and written information simultaneously. A detailed excursion in that direction would exceed the scope of this master thesis, but in accordance with these findings, it was decided not to add subtitles to the learning video (details see Chapter 3.2).

What must be considered as well is: Videos are often posted and shared in social media, which can be a good thing if the conveyed health information is correct and valid [68]. It quickly becomes uncontrollable and dangerous when videos that contain mis- and disinformation go viral.

Based on the presented literature about (digital) health literacy and (digital) health information, the following can be assumed: Digital formats like a learning video in combination with a smart speech assistant quiz about patient empowerment and patient safety are suited

- to present general health information about patient empowerment and patient safety,
- one advantage being the increased accessibility e.g., for people with low reading skills.

In the following chapters, the other part of the intervention – the patient safety tips – are discussed before further technical background, and specifics necessary for the planned intervention is provided.

## 2.2 Patient Safety

To reiterate, one part of the learning video and smart speech assistant quiz contents will be about safety tips for inpatients. According to the WHO [75] patient safety has been part of global public health strategies for a while now, gaining more and more importance. Millions of patients are harmed or injured due to avoidable causes such as medication errors, health care associated infections or diagnostic

errors. These so-called “adverse events” are considered one of the top ten leading causes of worldwide death and disability. In 2018 the Global Patient Safety Collaborative [75] was established. One main effort of the collaborative is to lower the risk of preventable patient harm. The strategic approach is inter alia for governments to prioritize patient safety but also to support and promote safety culture and people’s engagement.

The WHO about patients [76, p. 7]:

> “Action must be taken to empower them and build their capacities as informed and knowledgeable health care partners. Health care organizations should (…) foster collaboration among patients, families, communities, health care providers and policy-makers (…).”

Following the WHOs recommendations, Austria passed a law called the Patient Charter (“Patientencharta”) [76]. In Chapter four, the right to self-determination and information is stated. According to the law, patients have the right to

- be informed (in advance) about possible diagnosis and types of treatment as well as the associated consequences and risks.
- be educated about their state of health and necessary cooperation in their recovery process.

The type of education must be adjusted to the patient’s personality structure and cognitive abilities. The extent of the information must be based on the patient's wellbeing.

Another national initiative is the Austrian Patient Safety Strategy (“Patientensicherheitsstrategie 2.0”) [77]. It is stated that patient safety must be anchored in all health care structures and processes. In accordance with the Austrian patient-charter, the strategic goals are inter alia informing citizens and patients on patient safety issues, improving health literacy and to actively involve them in the treatment processes.

The Global Patient Safety Collaborative [75] also created an international patient safety network with more than 125 member-countries. For several years now, a central objective of this network has been the empowerment of patients and their dependents.

The Austrian Network for Patient Safety (“Österreichische Plattform Patientensicherheit” – ANetPAS) has also published several documents concerning the topic of patient empowerment [78] and combined them in a handbook that gives a good summary of the risks and dangers patients face during a hospital stay [17]. The

handbook provides information on how patients can actively participate in their recovery process and influence their individual risk of patient harm. The next chapter summarizes the contents of the mentioned publication.

### 2.2.1 Safety Tips for Inpatients

The ANetPAS is an independent network [17]. Its members include all relevant institutions and experts – with a focus on patient-safety and quality – of the Austrian health care system. It was founded in 2008 and collaborates as a partner of the European Network for Patient Safety (EUNetPAS). In the mentioned handbook that serves as a guideline for a safe hospital stay, the ANetPAS addresses adult people who are hospitalized due to a physical or psychological or psychiatric condition. It informs about what to expect during a hospital stay and how to actively contribute to the individual safety. Chapter one deals with the personal data, Chapter two with the treatment plan, Chapter four informs about patient rights. Especially Chapter three is of interest, as it deals with the active patient role and provides some helpful tools. The handbook urges patients to speak up, raise concerns and ask questions when something is unclear, seems strange or is difficult to understand.

As summarized below, the guideline gives ten safety tips for patients [17]:

1. **Ask questions and raise concerns:** It is important for patients to understand their treatment, medical test results and reasons for their hospital stay. Answers must only be accepted when they are clear and comprehensible. Repeating what was heard to the treatment team, helps confirming the correct understanding of what has been said.
2. **Inform the treatment team about your habits:** Informing the treatment team about any medication that is taken, as well as about alternative treatments, diets, nutritional supplements, and herbal or homeopathic medicines is vital. Patients need to let the healthcare staff know if they have drug or food allergies or suffer from any other allergies or intolerances.
3. **Take notes during your hospital stay:** Keeping a journal of the personal experiences regarding the individual health status is recommended. In doing so, specific questions from the treatment team can be answered more easily and vice versa.
4. **Bring your confidant(s) to consultations (“more ears hear more”):** Taking e.g., a family member to a consultation with a health expert lowers the risk of misunderstandings or misinterpretations.
5. **Let your confidant(s) support you:** Patients can ask a person of trust to talk to the treatment team with them or in their place if they are not in the condition to do so themselves.

6. **Check your personal data:** Prior to every examination, medication, treatment etc. the patient's identity must be checked. Patients should make sure that they are identified and – most importantly – that they are identified *correctly*.
7. **Ask questions about your surgery and treatment:** Before undergoing surgery, patients are informed about the course of the procedure and treatment. The surgeon usually marks the surgical site.
8. **Tell the treatment team if you feel unwell or are in pain:** To promote the recovery process, it is crucial for the treatment team to know whether a patient feels unwell or is in pain, even if it is not directly caused by the reason for the hospital admission.
9. **Inform yourself about your discharge and post-treatment:** Patients must be aware if and how their treatment proceeds after their discharge from the hospital.
10. **Inform yourself about your medication:** Knowing the names, effects, type, and duration of application of all prescribed medication is of vital importance for patients. They must be aware of possible side effects or probable interactions e.g., with other medication, food, or drinks.

Effective communication of possible risks to patients is crucial. Patients need to be informed about the risks associated with their treatment [50], [53], [79] so that they can actively contribute to their safety during e.g., a hospital stay [17].

Being easy to understand and developed especially for patients, these safety tips will cover one part of the learning video as well as the smart speech assistant quiz. To not exceed the scope of the intervention, not all tips were included (details see Chapters 3.1 and 3.2).

## 2.3 Virtual (Speech) Assistants and Skills

One part of the planned intervention is the use of a smart speech assistant quiz that should help revising and reinforcing the contents of the learning video. This chapter gives an overview about some important facts concerning virtual speech assistants, skills, neural voices, voice learning etc. Terms like "voice assistant", "intelligent virtual assistant", "intelligent personal assistant", "digital assistant", "smart speaker" etc. are often used synonymously.

Speech assistants are natural language dialogue systems that answer users' inquiries and perform tasks for them, in private and economic contexts [80]. They

can be found on smartphones as well as in smart speakers, in robots and in vehicles. The technology understands spoken language with the help of Natural Language Processing (NLP) and applies it using a text-to-speech system. They are designed to imitate human beings [81]. Not all intelligent virtual assistants actually "talk", some only provide written answers [82]. But there is a clear distinction to the term "chat bot" as intelligent virtual assistants are not limited by a given script. Smart speech assistants can process responses they have not been directly programmed for, using NLP.

If a smart speech assistant is switched on, it listens to its surroundings – when it hears a key word, it starts recording [83]. The recorded information is then sent to a server that analyzes the data and sends back a command for the smart speech assistant to interpret (an internet connection is necessary). Smart speech assistants can e.g., play music, switch on light bulbs, or simply read back the information the server sent to the user, providing an answer to a question e.g., about the weather.

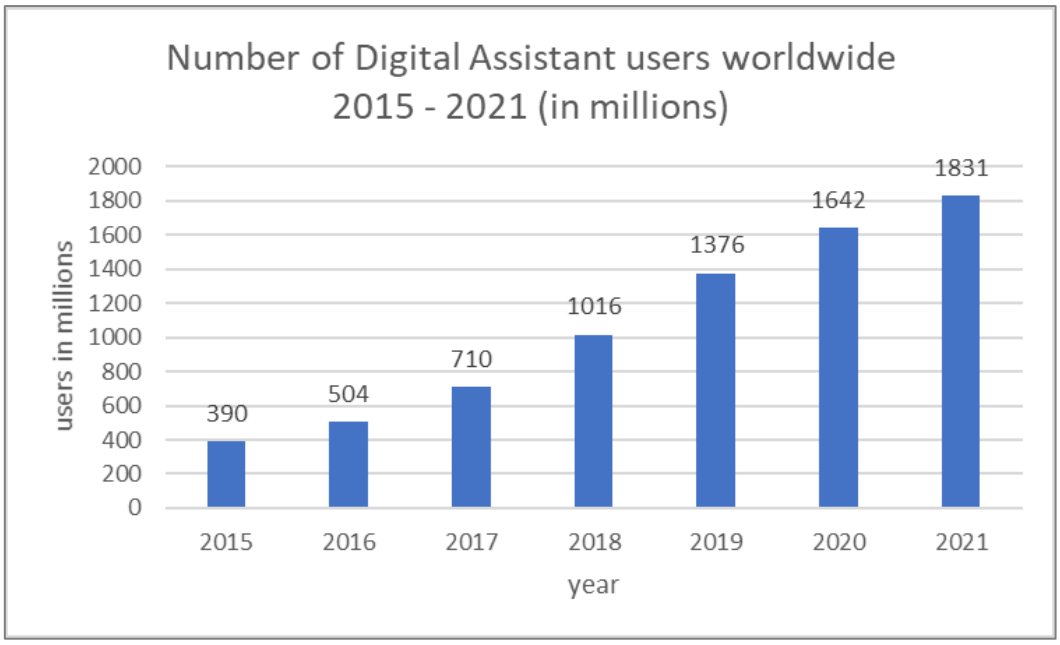



Figure 7 Number of Digital Assistant users worldwide (2015 - 2021), own representation based on a publication by Statista [84]

Figure 7 [84] displays the worldwide number of digital assistant users in the years 2015 to 2021. This number has grown from 390 million in 2015 to 1.8 billion users in 2021.

Smart speech assistant vendors often provide a platform for so-called "skills" [83]. Skills interface with other systems and in doing so, users may order foods or drinks, play games, or call a taxi using their smart speech assistant.

Voice assistants have lots of benefits but also impose barriers. One study [85] showed that many still favor health professionals providing general health information compared to a smart speaker. However, smart speakers are perceived as helpful concerning general search tasks and general health-related decision making. Pearl [86] confirms that some people may feel uncomfortable when talking to a computer and that privacy but also volume can become an issue when using a smart speaker in public. And then there are those who simply prefer texting for individual reasons.

One advantage is that smart speech assistants can also be used to support disabled users with e.g., limited mobility by promoting their independency [87]. People having difficulties using computers due to small keyboards etc. can profit as well: A study from 2018 [88] indicates that although many are opposed to adopting new technologies, voice-enabled user interfaces are a possible option for elderly people.

In a report by National Public Media [89] results of a national survey about “Smart Audio” (conducted in the United States of America) were published. 68% of the respondents agreed that a smart speech assistant facilitates daily life, 65% stated that the technology has improved lately and 41% would not want to stop voice-operated assistant use. For details see Figure 8.

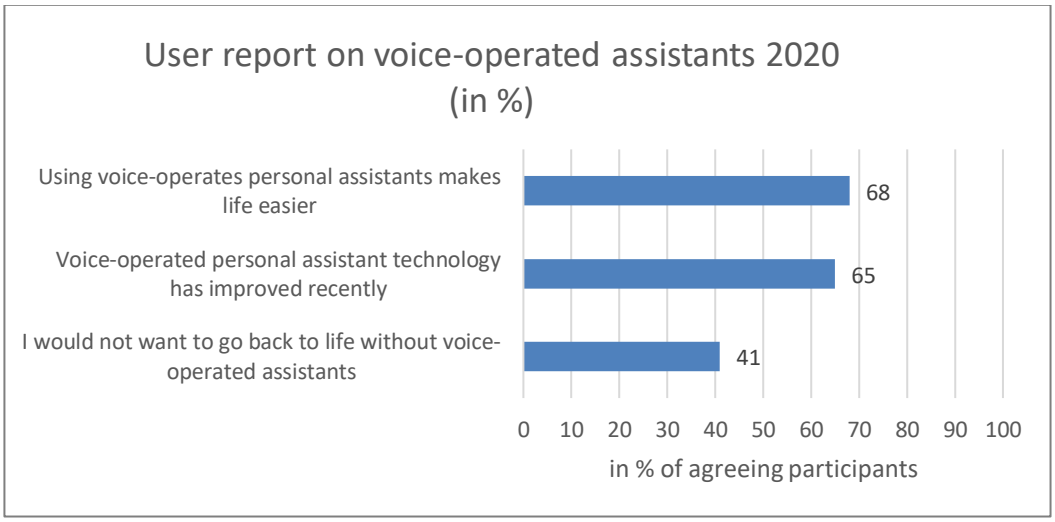



Figure 8 User report on voice-operated assistants (The Smart Audio Report), own representation based on a diagram in the Smart Audio Report [89]

Researchers [90] also studied the use of smart speakers for care home residents. They provided people with a physical or mental disability with smart speakers. The common use cases were listening to music, poetry, or jokes, asking for recipes, switching on and off lights or making calls. The benefits associated with the use were reported as well (in order of frequency of response): enjoyment, relaxation,

feeling of companionship etc. Another study published in 2021 [91] tested the use of a smart speaker, modified with an algorithm into a short-range active sonar, to assess patients' heart rhythms. Evidence [92] also indicates a use for intelligent virtual assistants to positively influence health behavior. However, the authors of the cited study point out that this is a very young field of research. It is necessary to further investigate and test the application of virtual assistants in inter alia for efficacy and safety.

Pearl [86] described some advantages of voice user interfaces as an additional way of communication (next to texting or video-chatting etc.). One being speed (speaking is much faster than typing). Intuitiveness is another pro to be mentioned, talking being a basic skill, meaning that people can use smart speech assistants without much explanation. Furthermore, smart speakers can be used while one's hands are occupied (e.g., during housework or while working out), which is also an advantage. Moreover, voice can transport emotion in a way that text cannot (volume, tone etc.), which can be used to transport some sense of empathy.

According to experts [81], smart speech assistants will soon be able to give solid health-related recommendations based on patient's data. Conversations will become more human-like, smart speakers being able to react to patients' emotions. Smart speech assistants will be used in self-therapy, as diagnostic support tools for health experts as well as for anamnesis. However, experts do not believe that smart speech assistants will ever replace human actions, only supplement them. These predictions were made based on a two-stage Delphi study[7].

Risks and privacy issues are always a topic when it comes to online services [94]. Smart speech assistants are of special interest as they continuously listen to their surroundings. Interestingly, many smart speaker users are not especially worried by that. Chalhoub et al. [94] found out that users do have doubts, but practically trade their privacy for the benefits of digital speech assistants and are not especially concerned by that. As regards health information, users seem to be more worried about confidentiality [85].

Though currently only few intelligent voice assistants (or rather skills) are approved to give complex medical advice or collect personal health data, most development platforms have strict policies about health-related skills. Amazon [95] inter alia rejects skills that collect data related to physical or mental health. If health-related skills are approved they often must contain disclaimers and/or developers must

[7] „The Delphi method is a forecasting process framework based on the results of multiple rounds of questionnaires sent to a panel of experts […]" [93]

prove their right and qualification to provide e.g., information about medication administration. “Ask my Pregnancy” – a skill for pregnant women offering medical information, “Cal Pal” – providing a calculator to determine the amount of calories burned off by different exercises or “Healthy Habit” – giving health-conscious recommendations when accessed are examples of currently available health-related skills [96]. In 2019 the NHS and Amazon have announced a collaboration [97]. Alexa devices will access the NHS’ websites to provide reliable health information to its users. Moreover, Amazon has recently patented [98] (not yet developed) a way of detecting whether the user of its smart speakers is sick to then offer the purchase of medicine.

The smart speech assistant quiz for this master thesis will be developed using Voiceflow [10] and the Alexa Skills Kit [11], details see Chapter 3.2. The next Chapter (2.3.1) deals with the characteristics of the neural voices that smart speech assistants such as Alexa use.

### 2.3.1 Neural Voices

A neural voice is generated by a deep learning model, designed to sound like a human being [99]. In contrast to the earlier types of synthetic voices (or robotic voices) they sound more fluid and natural. Some well-known neural voices are Amazon’s Alexa [100] and Apple’s Siri [101]. Neural Voices are based on a technology called neural TTS (text-to-speech) [102]. Text is analyzed and synthesized, using a deep neural network. The neural voice is trained based on samples of human voices, the goal being to sound as realistic as possible.

Cohn et al. [103] compared the perception of concatenative[8] and neural TTS. Neural TTS were found to be more realistic, conversant, and pleasant than synthetic voices. They also found a positive correlation between the rating of how human-like a voice sounded and the rating of its intelligibility. On the other hand, neural voices seem to be less comprehensible than concatenative TTS, especially when played in a room with background noise. The authors state that more research on the subject is necessary. According to Pearl [86] one downside of TTS is that they do not transport a feeling of being paid attention to in the same way a human speaker might.

Another interesting fact is that voice assistants usually use female voices and have female names [97]. Critics believe this to support gender stereotypes. The authors

[8] „Concatenative synthesis is based on the concatenation of segments of recorded speech. It is characterized by storing, selecting, and smoothly concatenating pre-recorded human utterances (phonemes, syllables, or longer units)” [99, p. 459]

of the publication (prepared inter alia by the UNESCO) “I’d blush if I could – Closing gender divides in digital skills through education” [105] took a closer look at that issue. The title of the document is adopting Siri’s answer to the statement “Hey Siri, you’re a bitch” (Apple has updated this reply in the meantime). According to the report, companies like Amazon state to have chosen a female default voice for their smart speaker devices based on evidence that female voices are more appealing than male ones. One study [106] reports that people favor low-pitch masculine voices (male or female). Junger et al. [107] report that there is a difference between men and women when it comes to voice perception. CNN Business [108] also refer to studies that suggest female voices to be more pleasant. An online article by Ella Fisher [109] discusses the fact that there is lots of evidence on the perception of female voices, but a lack of research concerning male ones. A detailed excursion in that direction would exceed the scope of this master thesis.

Taking the above into account a male *and* a female voice would have been chosen for the intervention (details see Chapter 3.1), but since Amazon Polly [9] only provides one female neural German voice (Vicki) this was not an option.

## 2.4 Learning and Testing

One part of the planned intervention of this master thesis includes the use of a smart speech assistant quiz to recap and reinforce the contents of the provided learning video. Due to the research question whether the planned intervention can positively influence patient empowerment, some facts about learning and testing need to be considered, before starting with the development of the video and quiz.

The German Institute for Integrative Learning-Therapy and Continuing Education (“Institut für integrative Lerntherapie und Weiterbildung”) [110] describes several learning types: auditive, visual, media-oriented, communicative, person-centered an motoric. For this master thesis the auditive and media-oriented learning types are of special interest. Mixed types are said to be very common. The auditive type learns mainly by listening and speaking. Students who learn through auditory systems can repeat contents by heart after a short time. Memorizing poems and melodies quickly and permanently comes easy to them. The media-oriented type has a natural interest in technology and learns well with audiovisual media, often not even needing a human teacher in addition. The VARK model [111] separates people into four similar groups: visual, aural/auditory, read/write and kinesthetic, also saying that mix-types are common.

Critics state [112] that the evidence on the effectiveness of using learning-styles in educational practice lacks in methodology and that further research is necessary.

Some experts [113] even state that the use of self-reported learning styles in teaching practice could even lead to adverse effects, as there is no empirical evidence on the subject. A detailed excursion in that direction would exceed the scope of this master thesis.

Learning experts [116 pp. 153-155] still cite Ebbinghaus who has developed the forgetting curve (Figure 9). Hardeland [116 p. 153] states that the forgetting curve displays the relation between time and remembering/forgetting. It shows that learned contents are forgotten relatively quickly. After 30 minutes only about 50% of the learned information can be repeated, about 30% after a day and only ca. 15% is remembered after 31 days. Ebbinghaus also inquired the effect of repetition on the ability to correctly reproduce learned information.

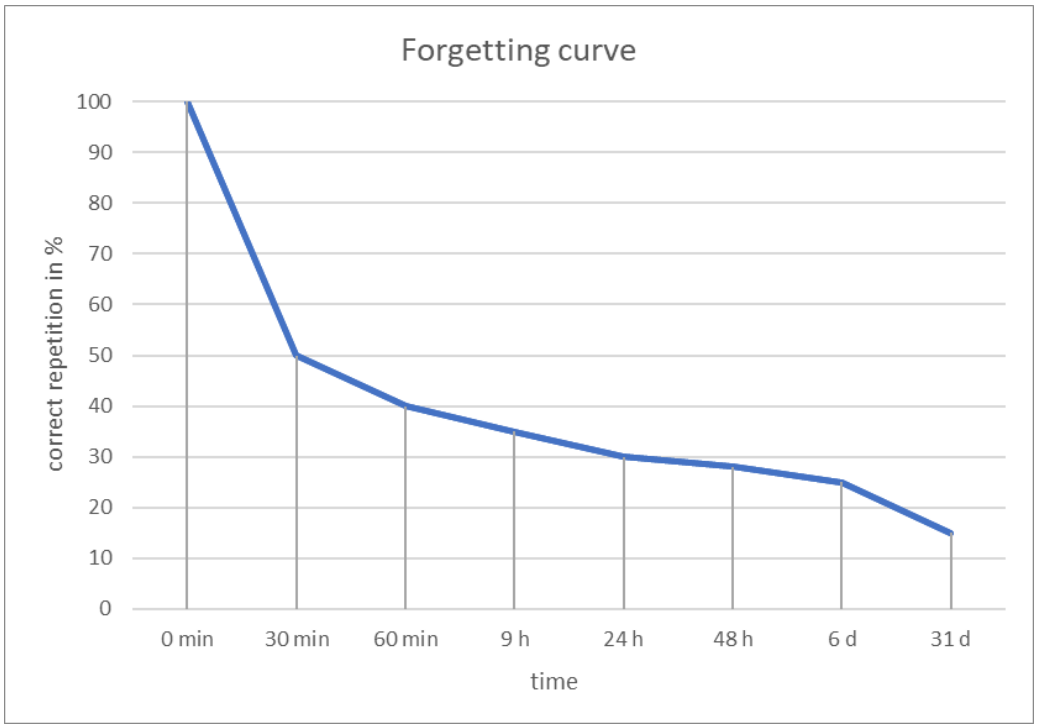



Figure 9 Forgetting curve, own representation based on a diagram by Hardeland [114, p. 154]

Hardeland [114, p. 155] describes: Repeating (testing) of learned contents positively influences memory, after the first repetition and second repetition the forgetting curves get progressively flatter (see Figure 10).

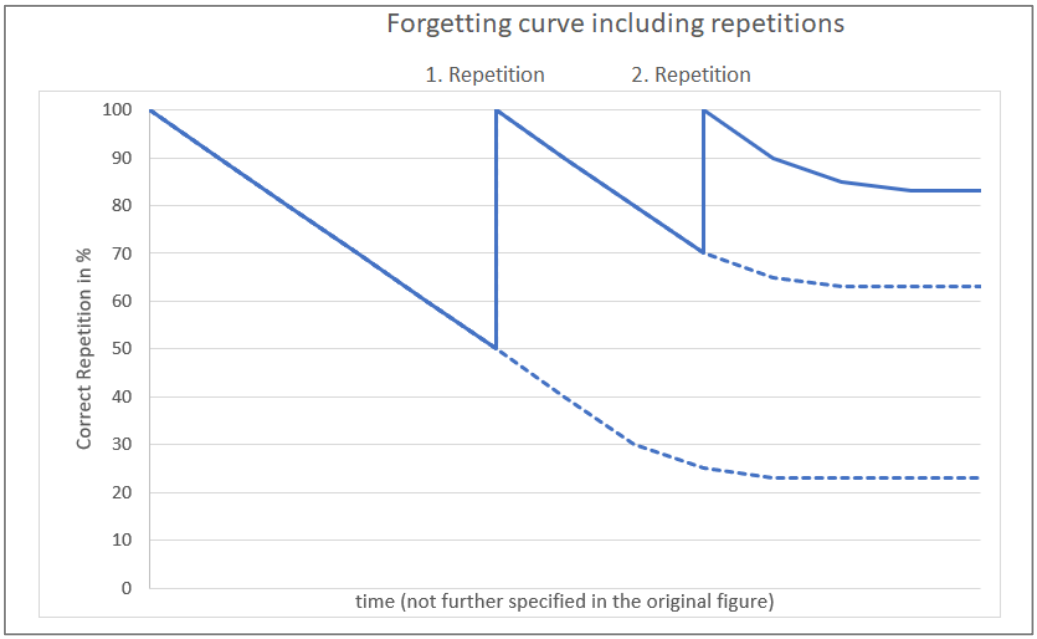



Figure 10 Forgetting curve - effects of repetitions, own representation based on a figure by Hardeland [114, p. 155]

Hardeland [114, p. 154] writes that repetitions are important to consolidate knowledge. Moreover, coherent, plausible contents are remembered more easily. Repeating learned information in small portions, distributed over several days is more effective than learning once for e.g., four hours straight.

Roediger et al. [115] state that it is highly effective in terms of memory to be tested on learning material. According to the authors, regular testing has a direct positive effect on learning. In another paper [116] Roediger et al. analyzed the so called “testing effect”. It has been shown that taking a test after learning promotes retentiveness - testing being more effective than studying. They conclude that testing is not only useful for assessing knowledge but also for consolidating it.

Taking the above into account, repeating the contents of the learning video by taking the smart speech assistant quiz or rewatching the video should positively influence the remembering of the presented contents. The effect of testing the heard information with the smart speech assistant quiz should be greater than of rewatching the video. The test persons will be asked to take the full smart speech assistant quiz and rewatch the video at least once over a time span of two weeks (details see Chapter 3).

# 3 Requirements / Methods

There is no universal definition of the term patient empowerment (see Chapter 2.1). As a basis for developing a questionnaire that measures the influence of the planned intervention on patient empowerment of the test persons, the WHO's definition of patient empowerment was chosen over others. This is due to the fact that the WHO established itself as a widely accepted global player.

The WHO [15] defines patient empowerment as a process, consisting of four components. At first the patient needs to recognize his/her role, secondly a certain amount of knowledge is needed to enable participation, as well as patient skills and the presence of a supportive setting (see Chapter 2.1).

The intervention will concentrate on the first two steps in the patient empowerment process. To support the test persons' understanding of their role as a potential patient, some basic facts about patient empowerment will be given, as well as tips on how to influence one's personal safety. The patient safety tips also cover the second part of the process, namely conveying knowledge that enables patients to actively engage. Due to their complexity and to not exceed the scope of the intervention, the last two steps of the empowerment process were not specifically targeted. Though a clear separation of all four process steps is not possible - as according to the EN ISO 9001:2015 [117] a process defines as a set of coherent steps that mutually influence each other. It can be expected that the gain of knowledge about patient safety and patient empowerment also promotes a patient's skills set. Directly influencing a facilitating environment, though, would require an intervention that also targets health professionals, policymakers etc.

The following exclusion criteria were defined. Due to the professional knowledge to be expected regarding inpatient stays: doctors and nurses could not participate. People who are *regularly* hospitalized due to a chronic illness like diabetes could not participate for the same reason. *Regularly* being defined as less than one year since the last hospitalization and/or a planned hospital stay during the survey period.

# 3.1 Contents for the Learning Video and Quiz

As noted before the learning video and smart speech assistant quiz will include general facts and questions about patient empowerment as well as patient safety tips. In this chapter, the contents of the learning video and quiz will be selected, discussed, and prepared to provide a basis for a suitable script.

As described in Chapter 2.1.3.1 good health information must inter alia be [51]:

- comprehensible
- (gender) independent
- target group oriented
- evidence based

The sources for the information about patient empowerment and patient safety were chosen according to these criteria. The facts about patient empowerment were taken from the EPF's "The Patients' Charter on Patient Empowerment" [16], the patient safety tips from the ANetPAS' guideline for a safe hospital stay [17]. They provide comprehensible and gender-neutral information. Both, the EPF [118] and the ANetPAS [119] are (part of) independent networks consisting of health experts and organizations, with the aim to inter alia provide accessible evidence based patient information.

All ten points of the patient charter [16] are listed in Table 3. Responsibility and the potential of influence were assigned to each item (based on the detailed description in the patient charter). The focus was laid on society, health care systems and professionals and the patients themselves. The intervention will cover the points where (part of) the responsibility lies within the individual patients' power and/or that can be (co-)influenced by them, listed below:

- 2 – The individual need, wish and chance of empowerment,
- 3 – equal participation in all health-related decisions,
- 4 – the right to understandable, accessible health information,
- 6 – and the support of self-management and care.

Table 3 Patient empowerment – patient charter items [16] including responsibility and potential of influence (assigned by the author of the thesis), own representation

| | **Patient Charter** | **Responsibility / Potential influence** |
|---|---|---|
| 1 | Being more than a health condition | society, health care system and professionals |
| 2 | Individual need, wish and chance of empowerment | patients |
| 3 | Equal participation in all health-related decisions | patients and health professionals |
| 4 | Right to understandable, accessible health information | patients, health care system and health professionals |
| 5 | Promotion of health literacy | health care system and health professionals |
| 6 | Support of self-management and -care | patients, health care system and health professionals |
| 7 | Patients' perspective as a tool for improvement | health care system and health professionals |
| 8 | Participation as a tool for evaluation and improving health services | health care system and health professionals |
| 9 | Importance of patient organizations | Society, health care system |
| 10 | Equality and fairness for all patients | society, health care system and health professionals |

In preparation for the video script, the patient safety tips [17] were assigned to the selected items of the patient charter [16], see Figure 11. Beforehand the patient safety tips [17] (see Chapter 2.2.1) were clustered into four main topics to enable a simplified display of the assignment to the chosen patient charter [16] items, see below.

- Questions:
    - 1. Ask questions and raising concerns
    - 3. Take notes during your hospital stay
    - 7. Ask questions about your surgery and treatment
- Information:
    - 9. Inform yourself about your discharge and post-treatment
    - 10. Inform yourself about your medication

- Support:
    - 4. Bring your confidant(s) to consultations (“more ears hear more”)
    - 5. Let your confidant(s) support you
- Speaking up:
    - 2. Inform the treatment team about your habits
    - 6. Check your personal data
    - 8. Tell the treatment team if you feel unwell or are in pain

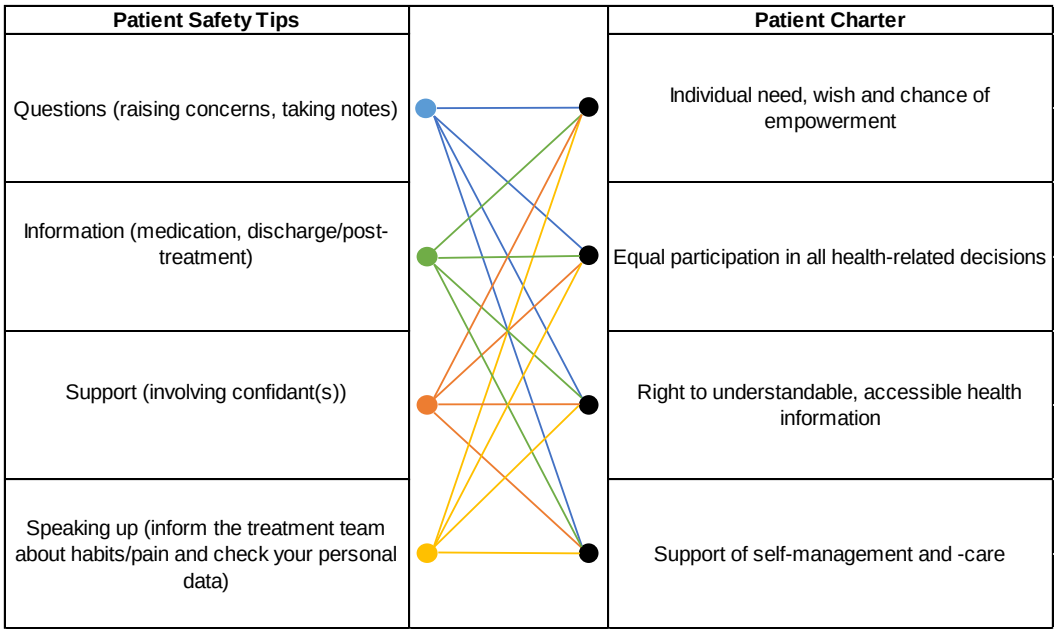



Figure 11 Assignment of patient safety tips [17] to patient charter items [16], own representation

Figure 11 shows that all patient safety tips [17] align and support each of the chosen patient charter items [16], which underlines the plausibility of combining these two topics:

- **The individual need, wish and chance of empowerment:** Empowered patients will ask questions concerning health-related topics. They likely will try to stay informed about their individual (post-) treatment, e.g., their medication and ask for support, if they feel they need it.

- **Equal participation in all health-related decisions** involves taking an active part in the treatment process by e.g., raising concerns and speaking up if something is unclear. It means demanding and checking data and information and asking for support, where needed.

- Empowered patients will claim **the right to understandable, accessible health information** by engaging with the health professionals and seeking the dialogue when something remains unclear. Confidant(s) can support patients, helping them to gather and understand the provided health information or help in formulating questions, if necessary.

- The success of **supporting of self-management and care** depends on the patients' individual wish for empowerment, participation and his/her interest and willingness to deal with understanding and accessing (or get help if needed) health information or health related decisions.

## 3.2 Development of the Learning Video and the Smart Speech Assistant Quiz

As noted in Chapter 2.1.3.1 patient narratives are a valid tool to convey health information, if general facts are presented as well [49]. Furthermore, as described in Chapter 2.4 coherent, plausible contents are more memorable [114, p. 154]. In Chapter 2.1.3.2 it was discussed that examples help people in understanding unfamiliar concepts and that behavior tips must be explained in small steps in order to be understood [61].

The chosen contents (see Chapter 3.1) for the video and the quiz were prepared accordingly. As the voices provided by simpleshow videomaker [8] were found to be not suitable for the presentation (no neural voice available) a voice by Amazon Polly [9] was chosen. The speaker "Vicki", using a female voice, presents the general facts and information about patient empowerment combined with the corresponding patient safety tips, using patients as examples. An attempt was made to adhere to the principals of writing good health information (see Chapter 2.1.3.2). The German version of the script (all test users are German native speakers) was enhanced by using tools recommended by the ÖPGK [52]. As noted, the video[9] uses no subtitles to avoid "overloading" the viewers (see Chapter 2.1.3.4).

Simple pictograms are faded in and out to support the audio of the video. All pictograms are provided by the used video software simpleshow videomaker [8], examples see Image 5.

[9] https://youtu.be/83qlW2ya7Yg

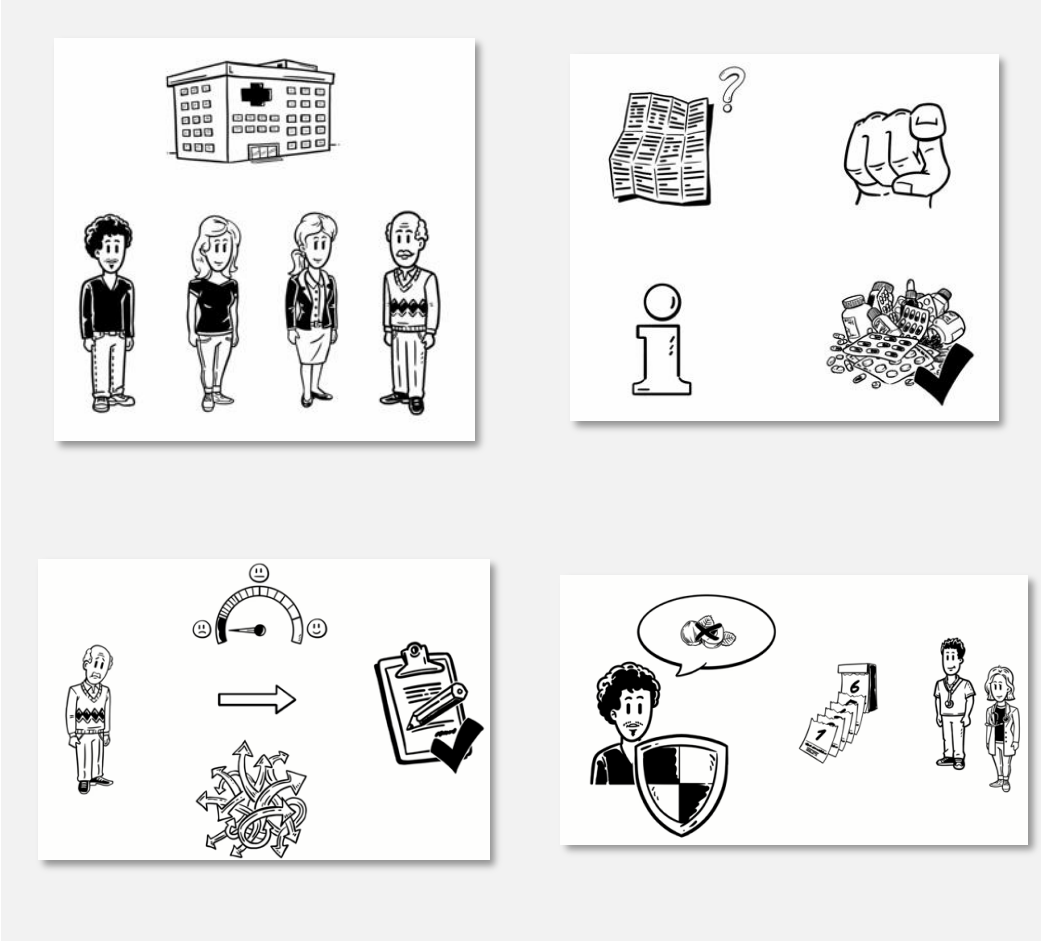


Image 5 Pictogram examples, provided by simpleshow videomaker [8] taken from the learning video developed for this master thesis

The video script (original text in German see Appendix D):

*This video shows what you can do for your health and safety in the hospital. The information in the video is deliberately explained in simple language.*

*These are Elias, Anna, Nina and Ben. All four are in the hospital.*

*Elias burned himself, his wife took him to the hospital. Because of his pain, he doesn't immediately understand everything the doctor says. His wife stays with him, listens, and helps him. It is wise to seek help in difficult situations. You can always bring someone with you to the doctor's appointment – more ears hear more.*

*Anna had an accident; she was badly injured and now needs a lot of medication. She wants to be well informed, so she reads the package insert and asks what is unclear to her. You too need to know about your medication. For example, why, how long and how much of a drug you must take. You also need to be aware of side effects. In doing so you quickly notice when something is wrong.*

*Nina needs an appendectomy. She is informed about the surgical method and the risk beforehand. Nina does not understand some of the medical terms and asks a lot. The same applies to you: Dare to ask! Only those who know their way around can make good decisions.*

*Ben is in the hospital for depression. He cannot concentrate well and writes down what his doctor says. In doing so, he can remember later. Nobody remembers everything. It's important to write things down, maybe you can think of something that you can't ask right away - write it down for later.*

*Anna is better. Her blood must be tested before she is discharged. The nurse always checks her identity beforehand. Anna is always careful herself. You too, need to make sure the staff knows who you are before exams, so you don't get mixed up.*

*Elias must stay in the hospital. He tells the nurse that he has an allergy, although the doctor already knows that. He is not afraid but wants to be sure that nothing is overlooked. The same goes for you: The staff needs to know about important things. Allergies are just one of many examples.*

*You already knew a lot of what you heard. Some things were new. Remember:*

*You must actively participate in your treatment and everything that goes with it. Ask questions and raise concerns when you don't understand something. Don't give up until all uncertainties are resolved.*

*Take notes during your stay or bring someone you trust.*

*Be informed about your medication and be careful before you take anything.*

*Be careful not to be mistaken for someone else by health professionals.*

*Even after your release, your recovery continues. Get all important information before you go home - it's your right!*

After a short introduction the video shows four example patients to convey information about patient empowerment and give patient safety tips. At the end a summary is given.

Compared to the video script, the smart speech assistant quiz' contents were slightly adapted to provide a question-answer-scenario. This additional provision of a quiz to consolidate the contents of the video should enhance memory (details see Chapter 2.4.) as repeating information positively influences the forgetting curve [114, p. 155], while testing has greater effects than learning [114, p. 155].

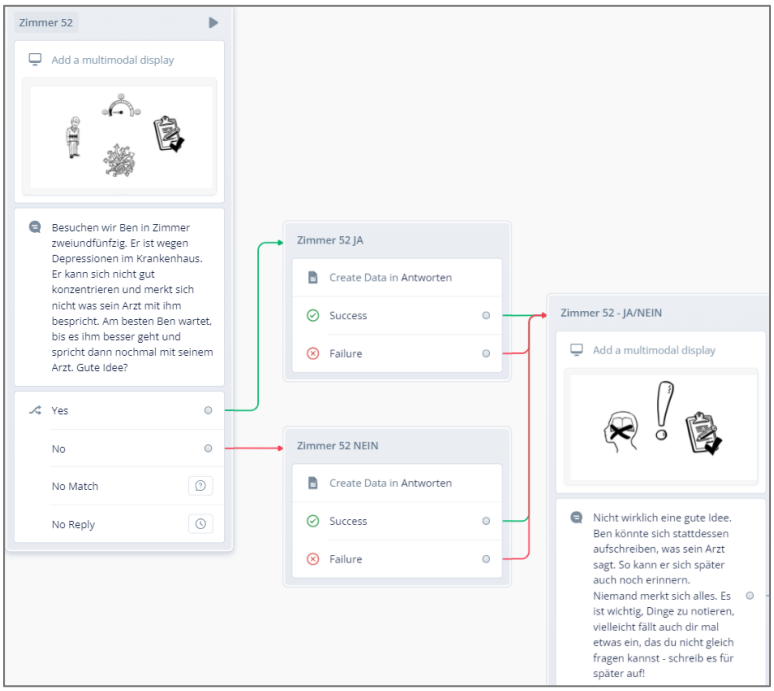



Image 6 Image section of the smart speech assistant quiz created with Voiceflow [10]

Image 6 shows part of the smart speech assistant quiz. It was created using Voiceflow [10] and published as a so called “skill” using the Alexa Skills Kit [11]. The skill was created in German, as all test persons were German speakers. The whole quiz script including screenshots of all quiz steps see Appendix E.

Voiceflow [10] is a tool for designing, prototyping and building smart speech assistants for different providers [120]. It provides different, prebuilt and reusable components (steps) and does not require coding [10]. The smart speech assistant quiz developed for this master thesis is called *Sicher Gesund* (invocation name) and was built and published for the use with the Alexa Skills Kit [11]. The skill uses speak-steps, containing text and choice-steps with two answering possibilities (yes and no). It also includes display-steps that show the same images used in the learning video. In doing so, users who own Alexa devices with a screen are offered an enhanced experience as the audio content is supported by the images. By using capture-steps and linking them to a Google Sheet [121] the users’ answers to the quiz’ questions were tracked. Another capture-step was used to ask for the same code that was used in the questionnaires (see Chapter 3.3), which later helped in combining and analyzing the collected data (see Chapter 4.2). In addition to the code, a unique user-ID, a time stamp, and the number of sessions (= number of times the quiz was accessed) per user were tracked. No-match and no-reply texts were added in the respective choice-steps to prevent users from dropping out of the skill when Alexa e.g., did not “understand” a given answer the first time. Moreover, users were allowed to continue previous sessions and to ask for the repetition

of their last interaction (e.g., the previous speak-step). In the skill description a disclaimer had to be included to meet Amazon Alexa's policy requirements [95] and pass certification:

> "The information in this skill is provided for informational and educational purposes only. It is not a substitute for professional medical advice, treatment, or diagnosis. Call your doctor to receive medical advice. If you think you may have a medical emergency, please dial your local emergency response phone number."

Voiceflow [10] also provides an automatically generated Privacy Policy[10] and Terms of Service [122] that were used. A quiz instruction was given to all participants explaining e.g., how to access the skill (see Appendix F).

## 3.3 Development of the Questionnaires

Since there is no widely accepted generic measure of patient empowerment [12], [19] (details see Chapter 2.1.1) the questionnaires for this master thesis were developed based on earlier research on the field. This master thesis utilizes a pre- and a post-intervention questionnaire. Both include items to determine the level of and knowledge about patient empowerment, as well as the knowledge about the provided patient safety tips. The questionnaires were distributed pre and post the intervention to facilitate answering the research question: Can a learning video in combination with a speech assistant improve patient empowerment prior to an unplanned inpatient stay? Based on the publications of Barr et al. [19] and McAllister et al. [12] (details see Chapter 2.1.1) some existing measuring instruments ([3], [123]–[126]) were identified from which a part of the questionnaires for this master thesis were derived. Table 4 shows all items needed to determine the patient empowerment level ("statements"). Both the pre and post intervention questionnaires contain all listed questions. Some items were generated according to the results of the literature research and the contents of the interventions (see Chapter 3.1). In addition to the items that concern patient empowerment and patient safety tips. Some demographical questions and a question about the level of education was added to the pre intervention questionnaire. Depending on the respective question the answering mode differs (e.g., a five-point Likert scale for the statements, Yes/No questions etc.). As all the recruited test persons are German speakers, both questionnaires are in German. To determine which pre- and post-intervention

[10] https://creator.voiceflow.com/creator/terms?name=Theresia%20Schauerhofer&skill=Sicher%20Gesund&children=false

questionnaire belongs to which person, the respondents were asked to generate a code (favourite musician/band plus last digit of the birth year, e.g., “Falco 6” or “Pearl Jam 9”). The same code was also asked in the quiz. The pre-intervention questionnaire contained a short introduction as well as a declaration of consent (see Appendix C). The participants were asked to watch the learning video and do the quiz as often as possible, but at least once during the survey period of two weeks. In addition, the second (post-intervention) questionnaire included questions about the perception and use of the learning video and the smart speech. This is inter alia to enable a comparison between test users who used the tools more often. Both questionnaires were created using LamaPoll [127]. The complete questionnaires can be found in the Appendix (see Appendix C).

Table 4 Questionnaires – Statements to determine the patient empowerment level, own representation

| | **Statements to determine the Patient Empowerment Level** | Derived from |
|---|---|---|
| 1. | When I am sick or hurt, my nurses, therapists, doctors and/or other health professionals alone are responsible for managing my health condition. | [123] |
| 2. | I must take an active role in all matters that affect my own health/recovery. | [123] [3] |
| 3. | If my doctor prescribes medication for me, I always inform myself about it in detail (e.g., (side) effects). | [123] |
| 4. | It is important to be informed about all aspects of one’s health-condition. | [3] |
| 5. | When I do not understand something a nurse, doctor, therapist, or another health professional explains, I ask questions until I do. | [17] |
| 6. | I always tell doctors, nurses, therapists, and other health professionals when I have doubts about a health-related decision. | [17] |
| 7. | When I am sick or hurt, I inform myself about different treatment options and discuss them with a health professional. | [3] |
| 8. | It is important to participate in all my health-related decisions. | [124] [3] |
| 9. | I let nurses, doctors, therapists, and other health professionals make all health-related decisions for me. | [16] |
| 10. | When I am sick, I inform myself about the causes of my health condition. | [123] |
| 11. | I can actively influence my recovery and well-being. | [123] |
| 12. | I ask confidant(s) for support when I need it. | [126] |
| 13. | I would tell my nurses, doctors, or therapists, if I were in pain or felt that something was wrong. | [17] |
| 14. | Only nurses, doctors, therapists, and other health professionals know what is best for me when I am sick or hurt. | [16] |
| 15. | I always make sure that a new therapist, doctor, nurse, or other health professionals I attend has all my previous health-records and health-related information. | [17] |
| 16. | When e.g., a nurse administers medication to me, I (would) always check its correctness, before taking it. | [17] |
| 17. | When I e.g., get my blood tested, I make sure the person taking the sample has checked my identity. | [17] |
| 18. | I know that I can change my mind concerning a treatment option. | [3] |

# 4 Implementation, Evaluation and Results

In this chapter the implementation of the questionnaires and intervention as well as the analysis of the results and the findings are presented. The test persons were recruited using the author's private and professional network, asking to further distribute the invitation. In the following evaluation, the overall responses are split up into smaller evaluation groups according to different suitable in- and exclusion criteria, when analyzing the pre- and post-questionnaires and the smart speech assistant quiz. An overview is displayed in Table 5.

Table 5 Evaluation groups based on in- and exclusion criteria for the respective analysis

| | # RESPONDENTS | EVALUATION GROUP |
|---|---|---|
| Respondents who did at least one of the questionnaires | 50 | - |
| Respondents who did the pre-questionnaire | 45 | - |
| Respondents who did the post-questionnaire | 41 | - |
| Respondents who did pre- and post-questionnaire | 36 | - |
| Respondents excluded due to formal reasons | 4 | - |
| Respondents included for the analysis of the questionnaires | 32 | 1 |
| Smart speech assistant quiz users | 28 | 2 |
| Respondents who did the pre- and post-questionnaire AND the smart speech assistant quiz | 23 | 3 |
| Respondents who have watched the video at least once* | 32 | - |

* Five did not provide an answer to the respective question in the post-questionnaire but supposedly watched the video at least once as they answered (at least one) the video-rating questions

# 4.1 Implementation of the Questionnaires and Interventions

The respondents were provided with a link to the online pre-intervention questionnaire that included explanatory notes (= “Introduction”, see Chapter 3.3 and Appendix C). At the same time, they received a link to the learning video as well as the instructions for the smart speech assistant quiz. An accompanying text reiterated that the learning video plus the quiz should be watched/done as often as possible but at least once. In addition, the notes contained inter alia setup instructions (see Appendix F), especially for users who were not in the possession of a device to play the quiz. Two weeks after the provisioning of the pre-questionnaire and interventions a link for the online post-intervention questionnaire was distributed to the same group of test users. The respondents were reminded twice – after a week (Day 8) and after twelve days (Day 13) – to (re-)-watch the video and (re-)do the quiz. The post-questionnaire was sent with the second reminder. The respondents were asked complete it until midnight of day fourteen.

# 4.2 Analysis and Results

50 test persons were recruited, 32 completed both questionnaires (= evaluation group 1, see Table 5, page 57). 18 people had to be excluded for formal reasons: Three did not provide a code as asked, five only did the post-questionnaire and six only the pre-questionnaire. One person had to be excluded because he/she had worked in nursing before (exclusion criteria). Three people were excluded because they did the pre- and post-questionnaires in an interval of only two days or less.

### 4.2.1 Demographics

From the remaining 32 respondents, ten were male and 21 were female (one person did not provide their sex). The majority (21) were aged between 25 to 39 years, six were between 40 and 59, the rest (six) stated to be over 60 years old. Most respondents (25) had studied at a university or a University of Applied Sciences (“Fachhochschule”), the rest had “Matura”, the Austrian general qualification for university (four) and two stated to have finished Statutory Education (“Pflichtschule”).

### 4.2.2 Evaluation of the Learning Video and Quiz

According to the answers given in the post-questionnaire (see Figure 12),

- 34% (11) of the 32 respondents watched the video once,
- 28% twice (9).
- 13% (4) watched it three times and
- 9% (3) watched it four or five times.
- 16% (5) did not provide an answer.

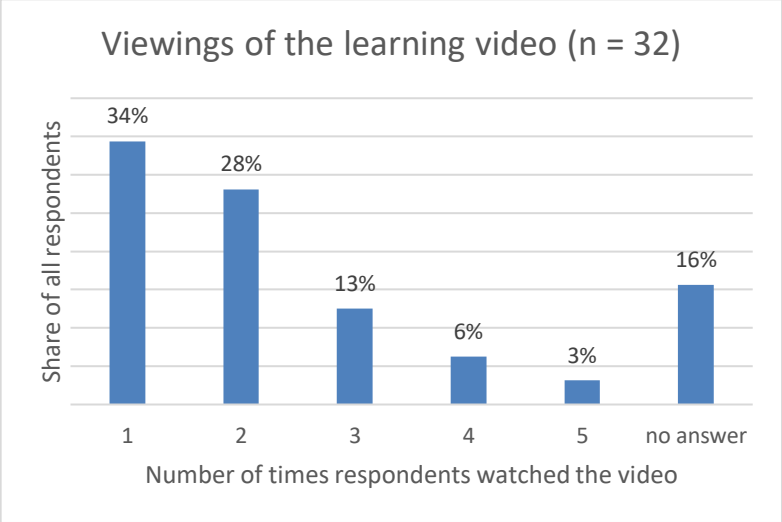



Figure 12 Viewings of the learning video per respondent (n = 32)

As the video was published on Youtube [128], there was no way of verifying the actual viewing numbers per person. The majority rated the video to be very good or good (59% and 38%), one person (3%) rated it to be mediocre. Most found it to be interesting, understandable, and useful (100%, 97%, 97%). People were asked to provide further feedback in a free text field (optional). In two of the six responses given, the speed of the presentation in the video was found to be (too) slow, two people especially liked the graphics of the video supporting the information given by the speaker. One person stated that the video gave some important thought-provoking impulses.

As the quiz' answers from the smart speaker skill were also tracked using a Google Sheet [121], the number of actual sessions and the information given in the post questionnaire could be compared (see Figure 13).

- About half (48%) of the provided responses given in the questionnaire aligned with the analysis of the Google Sheet.

- 9% respondents did the quiz one time more often than they had claimed in the questionnaire,
- 21% did it one or two times less and
- 22% did not provide an answer in the questionnaire.

According to the tracked data, 28 different users did the quiz. One session was excluded, because no code was tracked[11]. In one session the user did provide a non-assignable code but could later be assigned through the user-ID that was also tracked. As five of the 28 quiz users were excluded earlier (due to e.g., failing to complete both questionnaires), the answers to the quiz related questions of only those assignable to a pre and post questionnaire respondent were analyzed (= evaluation group 3, see Table 5, page 57; 25 people had originally rated the quiz in the post-questionnaire, but two were excluded as they did not actually do the quiz according to the analysis of the Google Sheet). According to the tracked data in the Google Sheet (see Figure 13)

- 52% of the 23 included respondents did the quiz once,
- 30% twice
- and 17% did it three times.

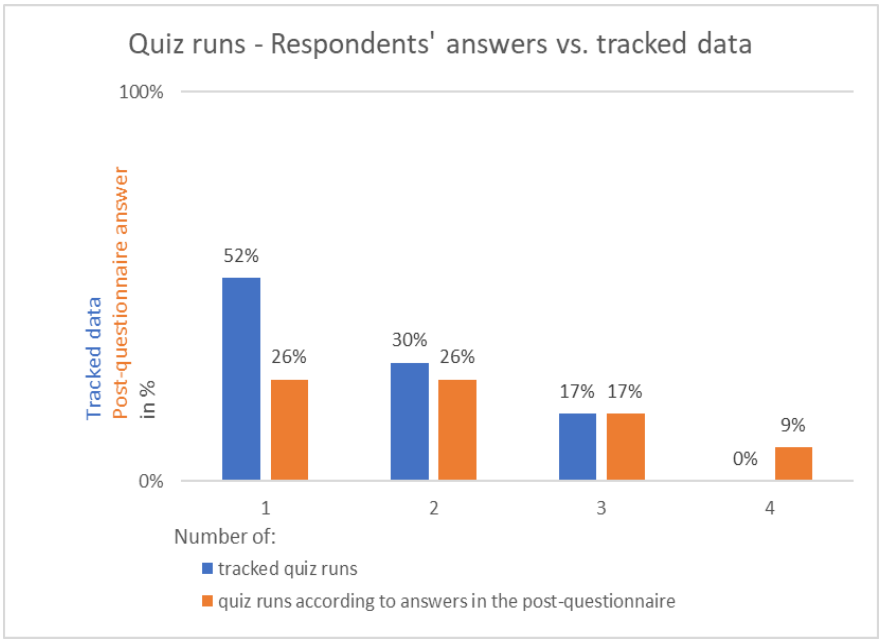



Figure 13 Quiz runs - Respondents' answers vs. tracked data, n = 23

[11] Whether a code was provided that was not tracked in the Google Sheet due to a technical failure or whether an external user did the quiz (the skill is available to everyone who owns an Alexa device) cannot be determined.

The majority rated the quiz to be very good or good (35% and 52%), two respondents (9%) rated it to be mediocre and 4% (1 person) did not like the quiz. Most found it interesting, understandable, and useful (87%, 91% and 87%). Some respondents gave further feedback in an optional free-text field. Three people found gathering information without visual support difficult. Two stated the quiz to be hard to navigate (no possibility of going back to previous contents during a session). Two users reported technical difficulties. One respondent stated that the contents of the video and quiz were redundant.

Of all 28 quiz users (including those who were excluded when analyzing the questionnaire; = evaluation group 2, see Table 5, p. 57), the time between the first and second repetition as well as the second and third repetition ranged from zero to nine days. The time span between the first and third repetition lay between five and twelve days. As stated before, the respondents were reminded twice – after a week (Day 8) and after twelve days (Day 13) – to (re-)watch the video and (re-)do the quiz.

Concerning the first quiz run: 14% did the quiz on the first day, 11% on the day of the first reminder, all others did their first quiz run on other days (see Figure 14).

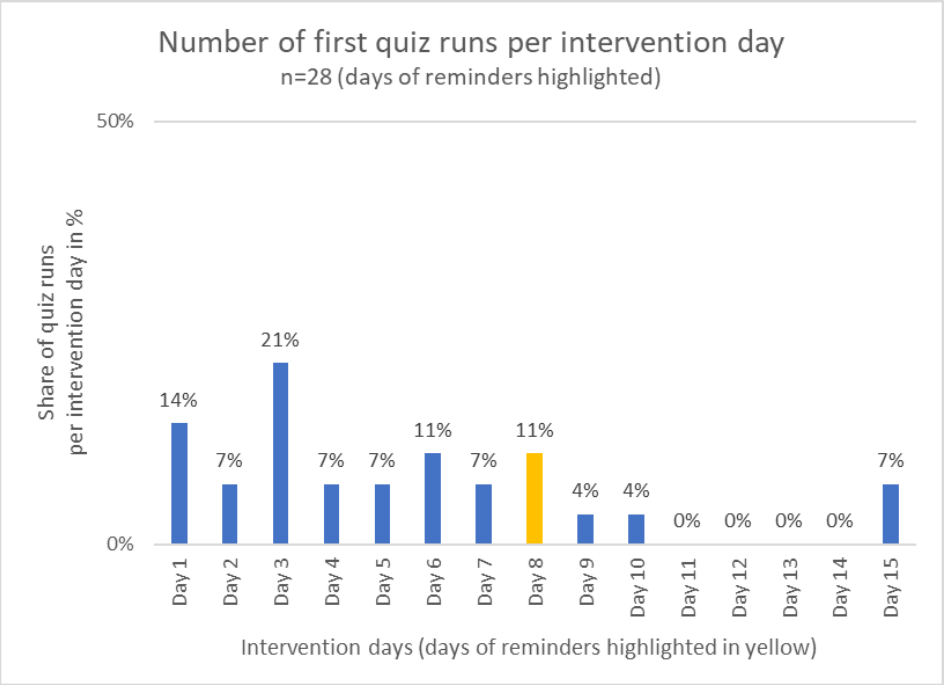



Figure 14 Number of first quiz runs per intervention day (days of reminders highlighted in yellow)

Concerning the second quiz run: 27% did the quiz for the second time on the day of the first reminder, one person (9%) did their second quiz run on the day of the second reminder (see Figure 15).

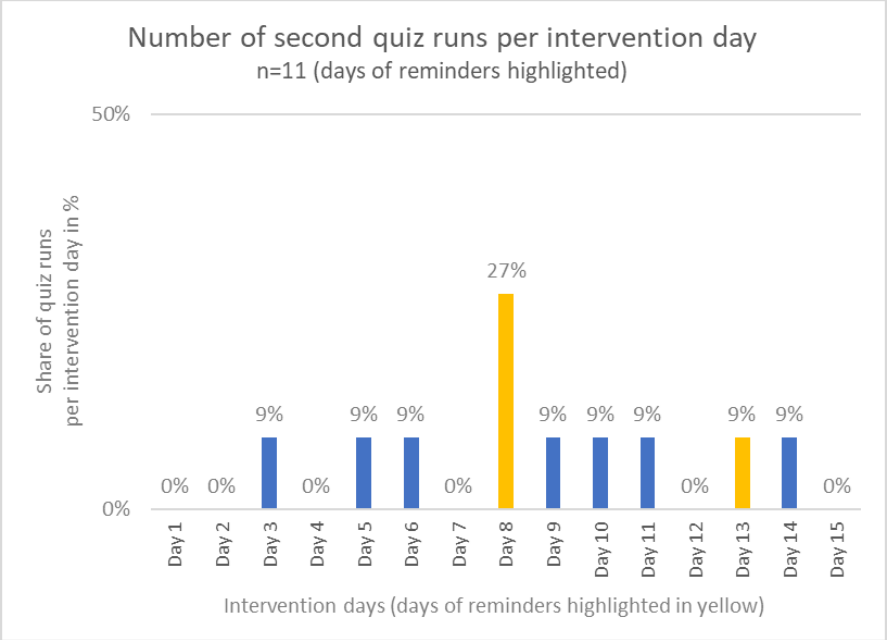



Figure 15 Number of second quiz runs per intervention day (days of reminders highlighted in yellow)

Concerning the third quiz run: 33% each did their third quiz run on the day of the second and third reminders (see Figure 16).

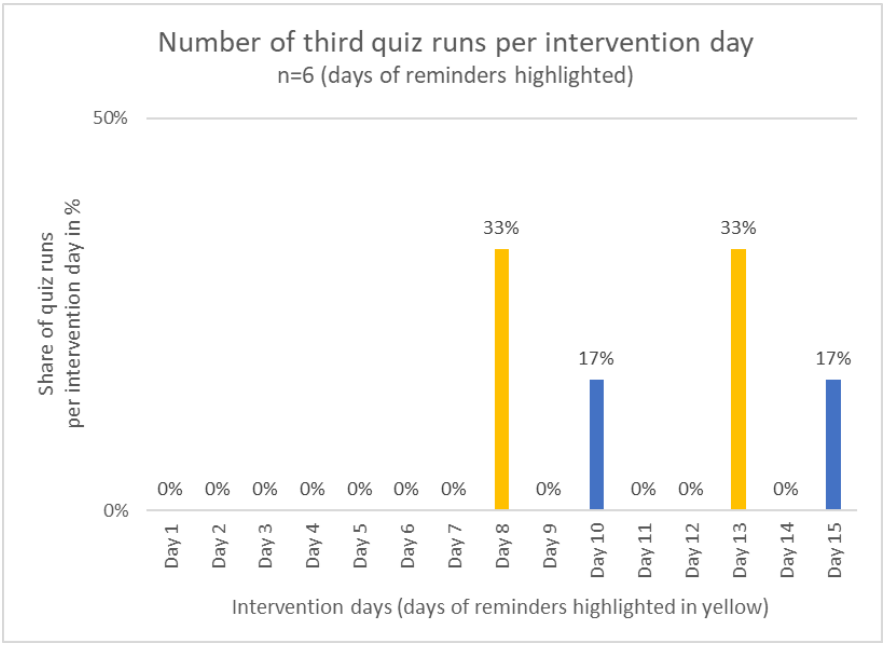



Figure 16 Number of third quiz runs per intervention day (days of reminders highlighted in yellow)

Days three and seven were Sundays, which might explain the higher number of quiz runs in comparison to most other days.

Overall, the quiz was completed 45 times. One person did not finish the whole quiz at once but a few days later in the first repetition. 14 times (= 32% of all completed quiz-runs) users needed more than one session to complete the quiz. Two users did answer all questions during their repetitions but stopped the quiz after the last question (the data of the Google Sheet provides no information about whether those two did hear the summary at the end of the quiz or not). Five users shared their Alexa device with one more person each (meaning that ten people, in pairs of two, used the same devices to complete the quiz).

37 of the 45 completed quiz-runs were assignable to one of the 23 included respondents of the pre- and post-questionnaire (= evaluation group 3, see Table 5, page 57). Concerning the answering possibilities in the quiz most of the questions were answered correctly by the respective users. Due to visualization reasons the quiz-questions in Table 6 were rephrased, which holds the risk of a slight distortion – for the original questions see Appendix E.

Table 6 Quiz responses (questions rephrased due to presentation reasons)

| **Quiz-Questions** n = 37 | **Correct Response** | **Total Correct answers (wrong answers)** | **Correction of answer towards a correct response - first quiz-run vs. later quiz-run(s)** | **Correction of answer towards a wrong response - first quiz-run vs. later quiz-run(s)** |
|---|---|---|---|---|
| 1. Should Elias' wife leave the examination room while Elias talks to the doctor? | NO | 37 (0) | 0 | 0 |
| 2. Should you also ask about further information concerning your medication like Anna? | YES | 36 (1) | 0 | 0 |
| 3. Is Nina smart when not asking about medical terms she does not understand and instead trusting her doctors? | NO | 32 (5) | 1 | 0 |
| 4. Should Ben wait until he feels better instead of asking his doctor right away about things he does not understand? | NO | 18 (19) | 6 | 1 |
| 5. Should Anna tell the nurse that the blood sample tube has a wrong name on it? | YES | 37 (0) | 0 | 0 |
| 6. Should Elias tell the nurse that he has an allergy although he has already told the doctor? | YES | 37 (0) | 0 | 0 |

- As Table 6 displays questions 1., 2., 5., and 6. were answered correctly by almost all users in all runs.
- Questions 3., and 4. seem to have been more difficult. The number of correct (18) and incorrect (19) answers given to question 4 (“Should Ben wait until he feels better instead of asking his doctor right away about things he does not understand?”) is almost equal. In later runs an incorrect answer was changed to a correct one in six cases. This could be ascribed to the given explanation in the quiz and suggests a learning effect.
- Question 3. (“Is Nina smart when not asking about medical terms she does not understand and instead trusting her doctors?”) was answered wrong five times, while one person changed their answer to the correct one in a following run.

It can be assumed that most respondents watched the video *before* taking the quiz – in the given instructions, the link to the video was provided first and the inhibition threshold of watching a video in comparison to taking a smart speech assistant quiz (which includes at least some preparation for most users) is likely much lower. It can be speculated, as the contents of the video and quiz were similar that most users already knew the correct answers to the quiz’ questions. Another possible explanation could be that the answers to the questions were simple and therefore obvious to most. As there were no data collected to determine whether the video was watched before or after doing the quiz, no definite conclusion can be made on this topic.

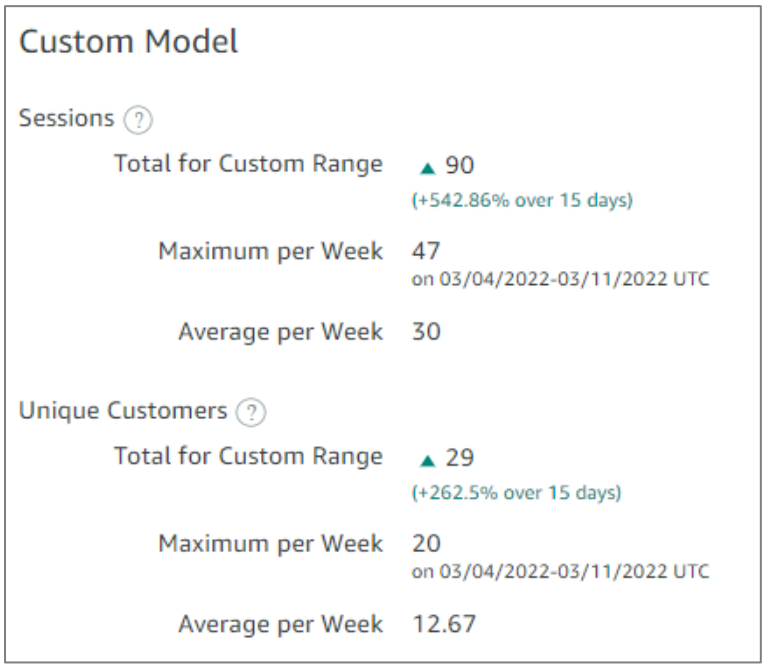



Figure 17 Custom Model of the smart speech assistant quiz, screenshot from Alexa’s Developer Console (custom range from 03/04 to 03/11/2022; only weekly or daily aggregation periods can be selected, actual observation period 03/04 to 18/03/2022)

The Alexa Skills Kit [11] also provides analytics in the associated Developer Console. Different reports and tabulations are provided, the filter possibilities are limited, however. Hence, showing analytics for only the respondents recruited for the master thesis was not possible. As the skill is public, other users without connection to this master thesis could access the quiz, which must be considered when interpreting the following examples. Figure 17 (a screenshot taken from the Developer Console) for example shows the number of sessions for the total custom range (including a trend), which was 90 in the observation period (as noted the quiz was completed 45 times, according to the tracked data in the Google Sheet). It also depicts the number of unique customers (29), the maximum per day (7) and the average per day (3.07).

Another example of what the Developer Console provides, is illustrated in Figure 18 that provides information about the number of successful sessions tracked in the Developer Console (the peak being on 11th of March (Day 13 of the intervention = the day of the second reminder), the failed sessions (= null; being defined as sessions that ended due to an error), the times users did not respond during the allowed time frame (= null) and the sessions in-progress/expired (being defined as sessions that are in progress – the quiz was not completed – or were ended implicitly).

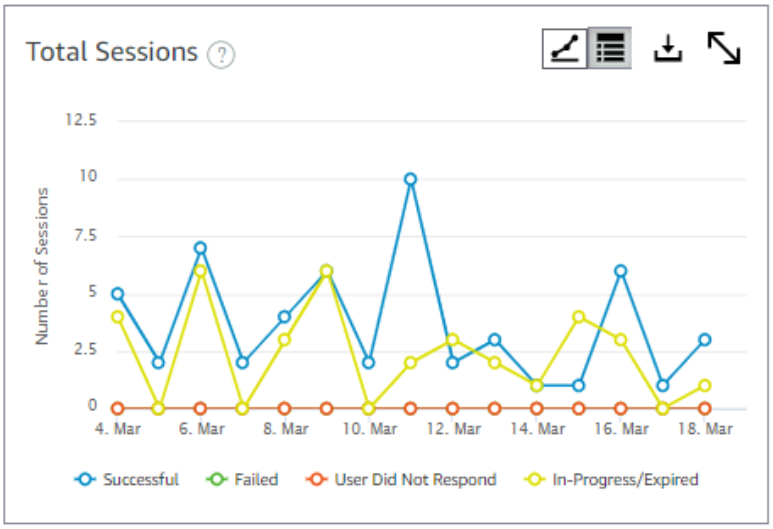



Figure 18 Total Sessions of the smart speech assistant quiz, screenshot from Alexa's Developer Console

### 4.2.3 Evaluation of the Patient Empowerment Levels

As described in Chapter 3.3, 18 Statements were given in the pre- and post-questionnaires, each evaluated using a five-point Likert scale 1 = I do not agree at all, 2 = I do not agree, 3 = I do not agree, nor do I disagree, 4 = I agree, 5 = I absolutely

agree). Three statements (1., 10. and 14.) had to be reverse coded to facilitate the calculation of a patient empowerment score (= the patient empowerment level) as Table 7 shows.

Table 7 (Invers-coded) statements to determine the patient empowerment level (own representation)

| **Statements to determine the Patient Empowerment Level** | Reverse - coded (x) |
|---|---|
| 1. When I am sick or hurt, my nurses, therapists, doctors and/or other health professionals alone are responsible for managing my health condition. | x |
| 2. I must take an active role in all matters that affect my own health/recovery. | |
| 3. If my doctor prescribes medication for me, I always inform myself about it in detail (e.g., (side) effects). | |
| 4. It is important to be informed about all aspects of one's health-condition. | |
| 5. When I do not understand something a nurse, doctor, therapist, or another health professional explains, I ask questions until I do. | |
| 6. I always tell doctors, nurses, therapists, and other health professionals when I have doubts about a health-related decision. | |
| 7. When I am sick or hurt, I inform myself about different treatment options and discuss them with a health professional. | |
| 8. It is important to participate in all my health-related decisions. | |
| 9. I let nurses, doctors, therapists, and other health professionals make all health-related decisions for me. | |
| 10. When I am sick, I inform myself about the causes of my health condition. | x |
| 11. I can actively influence my recovery and well-being. | |
| 12. I ask confidant(s) for support when I need it. | |
| 13. I would tell my nurses, doctors, or therapists, if I were in pain or felt that something was wrong. | |
| 14. Only nurses, doctors, therapists, and other health professionals know what is best for me when I am sick or hurt. | x |
| 15. I always make sure that a new therapist, doctor, nurse, or other health professionals I attend has all my previous health-records and health-related information. | |
| 16. When e.g., a nurse administers medication to me, I (would) always check its correctness, before taking it. | |
| 17. When I e.g., get my blood tested, I make sure the person taking the sample has checked my identity. | |
| 18. I know that I can change my mind concerning a treatment option. | |

All test persons who watched the video and/or did the quiz at least once (32 people; = evaluation group 1, see Table 5, page 57) were included in the analysis shown in Table 8. Pre- and post-intervention patient empowerment scores per user were calculated using the mean response (on the 5-point Likert scale) across all statements. The higher the score, the higher the patient empowerment level of the respective user (column one; lowest possible score being 1, highest 5). All numbers in Table 8 were rounded to one decimal place.

Table 8 (Change in) patient empowerment scores pre- and post-intervention including video viewings and number of quiz-runs per test person (own representation)

| Test person | Pre-intervention patient-Empowerment-score | Post-intervention patient-empowerment-score | Change: pre- vs. post-intervention patient-empowerment-scores | Learning video viewings | Quiz (runs) |
|---|---|---|---|---|---|
| 1 | 3.8 | 3.7 | -0.1 | n.a.* | 0 |
| 2 | 4.0 | 4.6 | 0.6 | 3 | 2 |
| 3 | 4.1 | 4.9 | 0.8 | 3 | 3 |
| 4 | 3.6 | 4.7 | 1.1 | 1 | 1 |
| 5 | 2.7 | 3.9 | 1.2 | 1 | 3 |
| 6 | 4.3 | 4.9 | 0.6 | 3 | 3 |
| 7 | 4.1 | 4.7 | 0.7 | 2 | 2 |
| 8 | 4.2 | 4.4 | 0.3 | 2 | 1 |
| 9 | 4.4 | 4.7 | 0.3 | 2 | 2 |
| 10 | 3.7 | 4.1 | 0.4 | 1 | 3 |
| 11 | 3.6 | 4.2 | 0.6 | 5 | 3 |
| 12 | 3.7 | 3.3 | -0.4 | 2 | 1 |
| 14 | 2.5 | 3.8 | 1.3 | 1 | 1 |
| 13 | 4.1 | 4.3 | 0.3 | 2 | 0 |
| 16 | 3.9 | 4.2 | 0.2 | 1 | 1 |
| 15 | 2.6 | 3.1 | 0.5 | 1 | 0 |
| 17 | 2.9 | 4.9 | 2.0 | 3 | 3 |
| 19 | 3.8 | 4.8 | 0.9 | 2 | 2 |
| 18 | 3.7 | 4.8 | 1.1 | 1 | 0 |
| 22 | 4.1 | 4.8 | 0.7 | 1 | 1 |
| 20 | 4.1 | 4.2 | 0.1 | n.a.* | 0 |
| 21 | 3.4 | 4.1 | 0.7 | 2 | 0 |
| 23 | 3.7 | 4.1 | 0.4 | 1 | 1 |
| 26 | 3.7 | 3.9 | 0.2 | n.a.* | 1 |
| 24 | 3.3 | 4.7 | 1.4 | n.a.* | 0 |
| 25 | 3.6 | 4.5 | 1.5 | 4 | 0 |
| 28 | 4.1 | 4.3 | 0.3 | 1 | 1 |
| 29 | 3.8 | 4.1 | 0.2 | n.a.* | 1 |
| 27 | 4.1 | 4.8 | 0.8 | 2 | 0 |
| 30 | 3.6 | 4.0 | 0.4 | 2 | 1 |
| 31 | 3.8 | 4.6 | 0.7 | 4 | 1 |
| 32 | 3.2 | 3.9 | 0.8 | 1 | 2 |
| Note: All numbers were rounded | **3.7** | **4.3** | **0.6** | **2** | **1** |
| | **AVERAGE** | | | **MEDIAN** | |

* n.a. = not answered; It is assumed that the respective test persons watched the video at least once as they rated the video in the post questionnaire

Table 8 displays that the patient empowerment score (level) of 30 (over 97%) from a total of included 32 test persons has increased post the intervention. In the last row of the table the average of all patient-empowerment scores (pre- and post-intervention) as well as the change between pre- and post-intervention scores was calculated. The median of the learning video viewings and number of quiz runs is depicted in the last row as well:

- The average pre-score of all users was 3.7; the post-score 4.3.
- The average improvement is 0.6.
- Most users watched the video twice (median) and did the quiz once (median).

The post-intervention score is depicted in the third column (orange). The last two columns show the number of learning video viewings and quiz runs per user.

- The three highest post-intervention scores were achieved by users (6, 17 and 3) who watched the video three times and did three quiz runs (post-scores of 4.9 each, differences pre- to post-score ranging from 0.6 to 2.0).
- In the fourth and fifth place (users 27 and 18) are two users that watched the video at least once (user 18 watched it twice), both did not do the quiz.
- Taillights (ranked by decreasing post-intervention scores) are users 12 and 15, with post-intervention scores of 3.3 and 3.1 (user 12 having a better pre- than post score).
    - Only user 12 did the quiz, both watched the video maximum once.
    - The user (15) with the second lowest pre-score of 2.6 achieved a post-score of 3.1, he/she did not do the quiz and watched the video once.

The pre-intervention score is depicted in the second (green) column:

- 34% (eleven users) had pre-intervention scores of minimum 4 (with 5 being the highest achievable score)
- The highest pre-intervention scores (4.2 and higher) were achieved by users 9, 6 and 8 (three different age groups), all with a university degree
- Taillights are user 14 and 15 (both aged 25-39 years, both having a university degree)

Change of pre- vs. post-intervention patient empowerment scores (shown in the fourth column):

- User 17 (top three in the post-interventions scores) also made the most progress of all users with a plus of 2.0 points pre- to post-intervention.

- User 15 has improved comparably to user 6 (top three in the post-intervention scores), with a plus of 0.5 points.
- Eleven respondents had a pre-intervention score with a minimum of 4.0 points and improved maximum 0.8 points in the post-intervention score.
- User 11 (video watched five times; three quiz-runs) improved by 0.6 points.
- The user with the lowest pre-score (14) watched the video once and did the quiz once, the difference of pre- and post-score being 1.3 points.
- Compared to user 5 who also did the quiz (but for the third time) and questionnaire on the last day, user 11 only improved by 0.6 points while user 5 achieved a plus of 1.2 points.

Figure 19 also depicts the changes of the pre- and post-patient empowerment in a different form: the pre- and post-intervention patient empowerment scores (y-axis) of every test user (x-axis) are visualized using a grouped bar chart. The green columns display the pre-intervention score, the orange ones the post-intervention score.

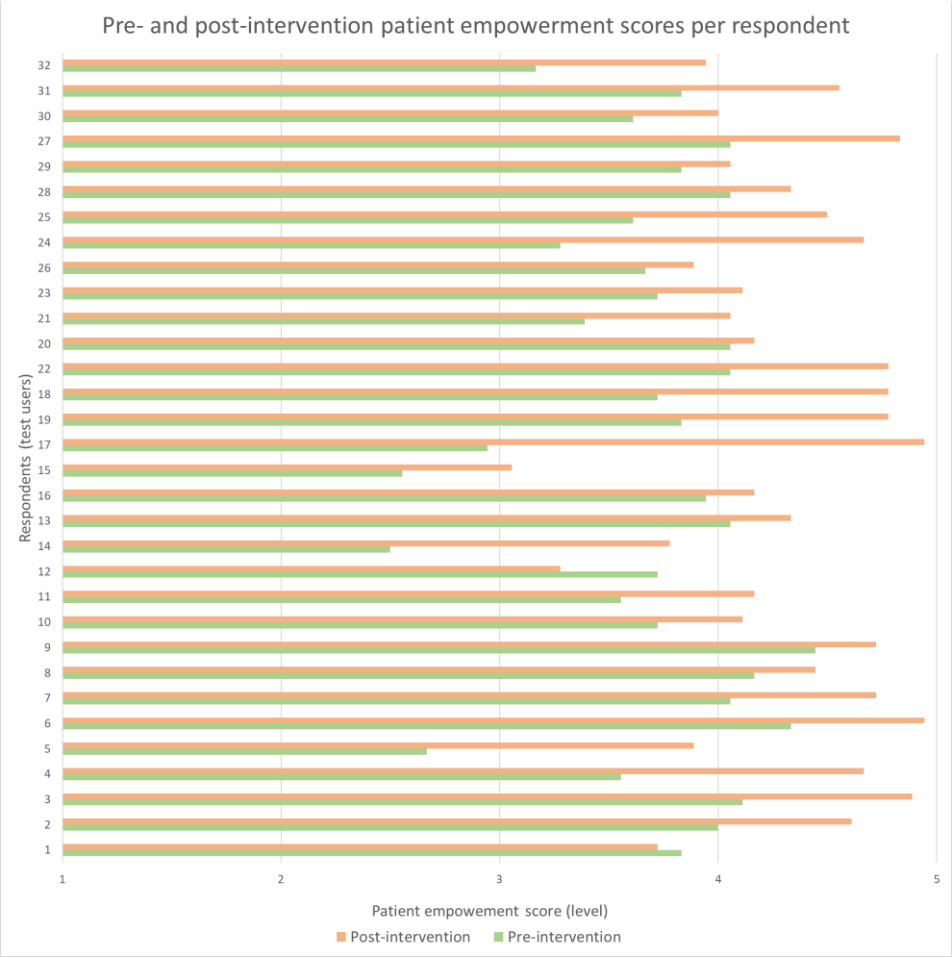



Figure 19 Pre- and post-patient empowerment scores per respondent (test person)

Users 16 and 11, did the quiz once on the last day of the two-week intervention and filled out the post questionnaire on the same day (not shown in Table 8).

As the distributions of sex, educational background and age of the test persons are not uniform, no definite conclusions concerning the patient empowerment levels can be made on this basis. It can be said that users with a lower pre-score achieved greater positive changes toward the post-score compared to those with an initially high score. Since all users watched the video at least once, it can be concluded that this contributed to the increase of the patient empowerment levels (30 of 32 respondents improved their patient empowerment level after the intervention). As not everyone has done the quiz and no one did *only* the quiz, the quantification of its impact on the patient empowerment level is cumbersome. The users with the highest post-scores all consummated both (video and quiz) more than once while the user (user 15, see Table 8) with the lowest post score did not do the quiz. It must be said that one user (user 12,) who did the quiz once and watched the video twice had a worse post- than pre-score, which seems to be an exception. The other user (user 1) who had a worse post-score did not do the quiz either and provided no definite number on how often he/she watched the video.

To determine whether the change in the patient empowerment levels pre- and post the intervention is significant, a Wilcoxon Signed-Rank Test has been performed using SPSS [129] (a statistical analysis tool for data). This nonparametric test is suitable for comparing a set of paired samples (pre- and post-scores of the same users) that are not normally distributed. The dependent variable being the patient empowerment level (score), the null hypothesis (h0) being that there is no change of pre- and post-scores after the intervention. As can be seen in Figure 20, h0 can be rejected, which means that there is in fact a difference between pre- and post-patient empowerment scores with a $p < 0.001$ (significance level = $\alpha = 0.050$). The effect size being high with $d = 0.9$ (not shown in Figure 20).

**Hypothesis Test Summary**

| | Null Hypothesis | Test | Sig.[a,b] | Decision |
|---|---|---|---|---|
| | The median of differences between Pre-score and Post-score equals 0. | Related-Samples Wilcoxon Signed Rank Test | <,001 | Reject the null hypothesis. |

a. The significance level is ,050.

b. Asymptotic significance is displayed.

Figure 20 Hypothesis Test Summary (Pre- vs. post-score per test person)

Another notation can be found in Figure 21. The asymptotic significance of < 0.001 is lower than $\alpha = 0.05$, h0 must be rejected. As said before, of a total of 32 data pairs, there are 30 positive ranks (post-score greater than pre-score), two negative ranks (post-score lower than pre-score) and no equals.

**Wilcoxon Signed Ranks Test**

**Ranks**

| | | N | Mean Rank | Sum of Ranks |
|---|---|---|---|---|
| Post-score - Pre-score | Negative Ranks | 2[a] | 7,25 | 14,50 |
| | Positive Ranks | 30[b] | 17,12 | 513,50 |
| | Ties | 0[c] | | |
| | Total | 32 | | |

a. Post-score < Pre-score

b. Post-score > Pre-score

c. Post-score = Pre-score

**Test Statistics[a]**

| | Post-score - Pre-score |
|---|---|
| Z | -4,668[b] |
| Asymp. Sig. (2-tailed) | <,001 |

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks.

Figure 21 Wilcoxon Signed-Rank Test & Test Statistics (Pre- vs. post-score per test user)

The individual statements within the questionnaires were also explored in detail. This only serves as a further explanation of the results. Table 9 (p. 72) lists the median chosen value (of the five-point Likert scale[12]) per statement in the pre- and post-questionnaires. The green rows display the pre-intervention value, the orange rows the post-intervention value.

- In the rightmost column the differences between post and pre value is displayed. There were no negative changes, statements 4, 6, 7, 9, 10, 15 and 16 kept their high values (the median of all statements was 4, pre and post).
- The median of the statements 1, 2, 11, 13 and 18 changed to a median from 4 to 5 (plus one). Statements 3, 5, and 12 document with a plus of 0.5 each.
- The greatest change occurred in statement 17 with a plus of 2 from pre- to post-questionnaire.

[12] 1 = I do not agree at all, 2 = I do not agree, 3 = I do not agree, nor do I disagree, 4 = I agree, 5 = I absolutely agree; statements 1, 10 and 14 reverse coded

Table 9 Statements: Median and Differences (Pre- vs. Post-intervention)

| Statements (Pre- and Post Questionnaires) | | Median | Change: Post to Pre |
|---|---|---|---|
| 1. 1. When I am sick or hurt, my nurses, therapists, doctors and/or other health professionals alone are responsible for managing my health condition. | Pre 1 | 4 | 1 |
| | Post 1 | 5 | |
| 2. I must take an active role in all matters that affect my own health/recovery. | Pre 2 | 4 | 1 |
| | Post 2 | 5 | |
| 3. If my doctor prescribes medication for me, I always inform myself about it in detail (e.g., (side) effects). | Pre 3 | 4 | 0.5 |
| | Post 3 | 4.5 | |
| 4. It is important to be informed about all aspects of one's health-condition. | Pre 4 | 4 | 0 |
| | Post 4 | 4 | |
| 5. When I do not understand something a nurse, doctor, therapist, or another health professional explains, I ask questions until I do. | Pre 5 | 4 | 0.5 |
| | Post 5 | 4.5 | |
| 6. I always tell doctors, nurses, therapists, and other health professionals when I have doubts about a health-related decision. | Pre 6 | 4 | 0 |
| | Post 6 | 4 | |
| 7. When I am sick or hurt, I inform myself about different treatment options and discuss them with a health professional. | Pre 7 | 4 | 0 |
| | Post 7 | 4 | |
| 8. It is important to participate in all my health-related decisions. | Pre 8 | 4 | 1 |
| | Post 8 | 5 | |
| 9. I let nurses, doctors, therapists, and other health professionals make all health-related decisions for me. | Pre 9 | 4 | 0 |
| | Post 9 | 4 | |
| 10. When I am sick, I inform myself about the causes of my health condition. | Pre 10 | 4 | 0 |
| | Post 10 | 4 | |
| 11. I can actively influence my recovery and well-being. | Pre 11 | 4 | 1 |
| | Post 11 | 5 | |
| 12. I ask confidant(s) for support when I need it. | Pre 12 | 4 | 0.5 |
| | Post 12 | 4,5 | |
| 13. I would tell my nurses, doctors, or therapists, if I were in pain or felt that something was wrong. | Pre 13 | 4 | 1 |
| | Post 13 | 5 | |
| 14. Only nurses, doctors, therapists, and other health professionals know what is best for me when I am sick or hurt. | Pre 14 | 4 | 0 |
| | Post 14 | 4 | |
| 15. I always make sure that a new therapist, doctor, nurse, or other health professionals I attend has all my previous health-records and health-related information. | Pre 15 | 4 | 0 |
| | Post 15 | 4 | |
| 16. When e.g., a nurse administers medication to me, I (would) always check its correctness, before taking it. | Pre 16 | 4 | 0 |
| | Post 16 | 4 | |
| 17. When I e.g., get my blood tested, I make sure the person taking the sample has checked my identity. | Pre 17 | 2 | 2 |
| | Post 17 | 4 | |
| 18. I know that I can change my mind concerning a treatment option. | Pre 18 | 4 | 1 |
| | Post 18 | 5 | |

Figure 22 below displays the median per statement pre- and post. Moreover, the range of chosen values is shown. For statements 16 and 17 e.g., every value on the five-point Likert scale was chosen at least once by a minimum one respondent in the pre- and post- questionnaires. The overall range of the values chosen in the pre-questionnaire being greater than in the post-questionnaire.

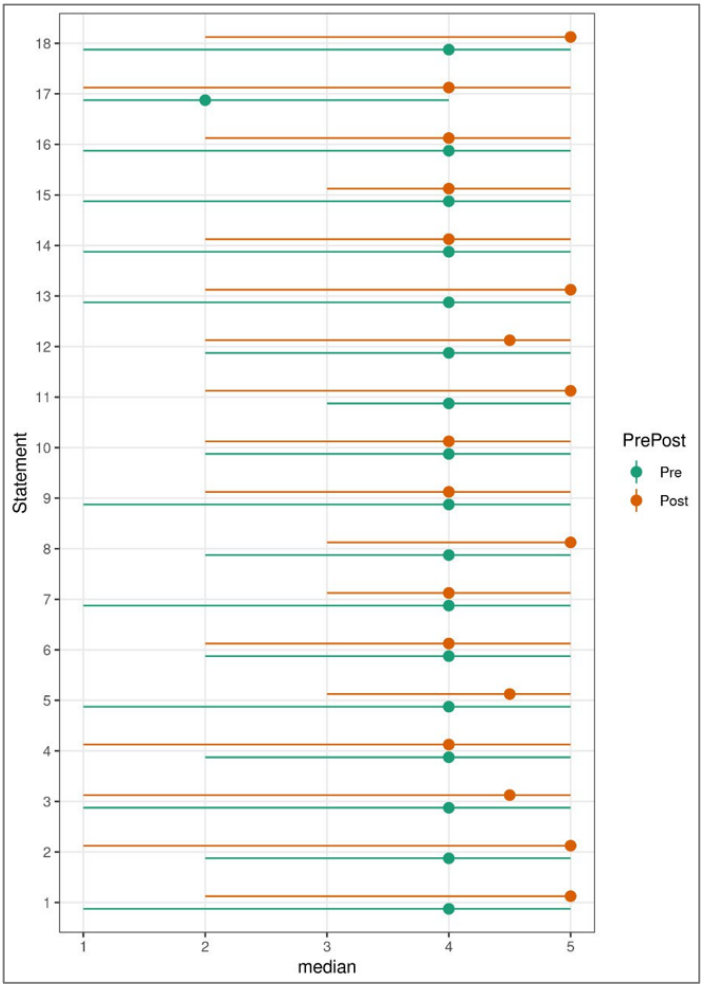



Figure 22 Statements: Median and Range (Pre- vs. Post-intervention)

Like for the user pre- and post-intervention patient empowerment score data, a Wilcoxon signed rank test was done for each statement as well. With a p-value greater than 0,05 (α), the users' answers to statements 2, 4, 11 and 14 (high pre median values of 4) seem to have no tendency towards a significant change when comparing pre- and post-intervention questionnaires, all other statements do (see Figure 23). It must be noted that, since these are not the main target parameters (main target parameter = the patient empowerment score), the small p-values depicted in Figure 23 only show tendencies but not valid significances.

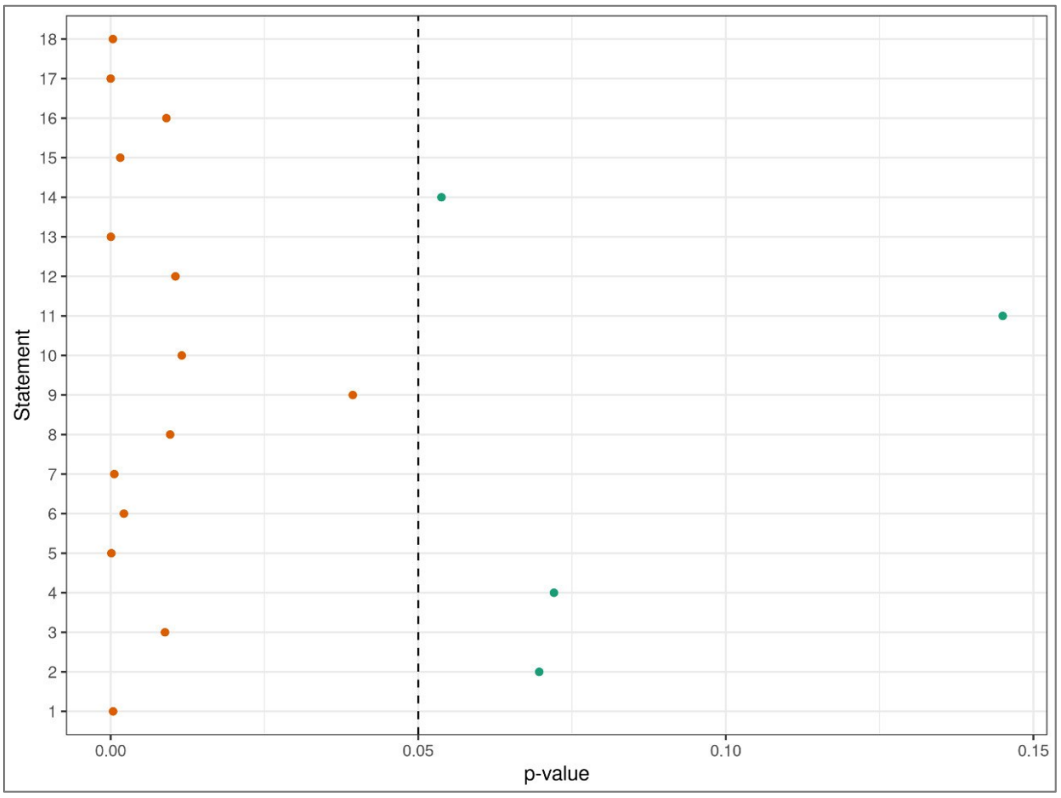



Figure 23 p-values per statement

The next chapter (5 Conclusion & Discussion) provides a summary of all results. Conclusions are made and limitations depicted.

# 5 Conclusion & Discussion

To answer the research question to what extent a learning video in combination with a smart speech assistant quiz can improve patient empowerment prior to an unplanned inpatient stay (due to a non-chronical disease) 32 healthy patients (= without chronical diseases) were recruited. The evaluation, facilitated by the development and provisioning of a pre- and post-intervention questionnaire completed by 32 participants showed that the patient empowerment levels were higher after the two-week intervention.

Since there is no widely accepted generic measure of patient empowerment, the questionnaires for this master thesis were developed based on earlier research in the field. Both questionnaires contained 18 statements to determine a patient empowerment score. The score was calculated using the mean response (on the 5-point Likert scale) across all statements. The higher the score, the higher the patient empowerment level of the respective user (5 being the highest achievable score, 1 the lowest). With an average pre-intervention patient empowerment score of 3.7 and an average post-intervention patient empowerment score of 4.3 (= a plus of 0.6), the Wilcoxon Signed-Rank Test showed that the hypothesis (h1) that the intervention does have an impact can be confirmed. H0 (= that there is no difference pre- vs. post the intervention) must be rejected ($p < 0.001$). Cohen's d was calculated as well – the effect size being rather high with $d = 0.9$.

The intervention consisted of a learning video and a smart speech assistant quiz that were assessed in the post-intervention questionnaire. Both, the video and quiz, were rated positively concerning intelligibility, usefulness and interestingness. According to the tracked data (using a Google Sheet) and the analytics provided in the associated Developer Console of the Alexa Skills Kit there were no major technical problems with the quiz. Most of the respondents complied with the request to complete/watch the quiz/video at least once, most did/watched it twice or more often. Reminding the participants to (re-)do the quiz positively correlated with the number of quiz runs on the respective intervention day. There is a chance that more reminders would have ultimately led to a greater increase of patient empowerment.

Whether the video that included simple pictograms and used a neural voice, or the quiz (created using Voiceflow, a tool for designing, prototyping, and building smart speech assistants for different providers) had greater impacts on the change of patient empowerment levels was not measured. A slight discrepancy between the

answers given in the questionnaire and the measured data became visible by comparing the tracked data skill usage data from the Google Sheet and the questionnaire (concerning the number of completed quiz runs).

Due to organizational reasons the smart speech assistant quiz was pre-tested only by a few people in the personal environment of the author and the author herself. There is the probability that using e.g., focus groups to evaluate and adapt the contents of the quiz, would have led to another (probably better) result concerning the patient empowerment levels.

Also, the great majority of the respondents had a personal connection to the author, therefore a social bias is possible. The goal of the intervention was clear to the participants, as it was communicated inter alia in the explanation text of the pre-intervention questionnaire. People may have answered the questionnaires in a way that they thought might "help" the author. As shown previously, the respondents also gave incorrect answers about how often they had done the smart speech assistant quiz. If this was done deliberately or because the correct number of quiz runs was not remembered cannot be determined.

Another factor to be considered is that the contents of the learning video and the quiz were similar. Whether other (greater or lower) learning effects could have been achieved, if the examples had differed, remains unclear. The evaluation of the quiz also showed differences in the answering behavior concerning the different statements. Some statements had greater variabilities than others, if that was due to e.g., wording or complexity of the statement was not evaluated and therefore cannot be determined. As noted, there was one statement where many respondents changed their answer towards the correct one in their second quiz run. Why the information about this particular example in the video was not "enough" to convince people of the correct answer can only be suspected. Additionally, a finer scale e.g., a seven- or ten-point scale would probably have led to a more differentiated self-assessment and changes occurring during the completion of pre- and post-questionnaire could have been displayed better.

It has been noted before, that the questionnaire has been developed especially for this master thesis as in the literature review no widely accepted generic measure could be found. Whether the 18 statements to measure the pre- and post-intervention patient empowerment scores could also be used in another scenario can only be conjectured. It might be also valid for measuring the patient empowerment levels in e.g., conjunction with unplanned/acute GP or other health professional consultations in the outpatient setting. Further studies and evaluations would be needed.

As the observation period of two weeks is rather short, no assumptions can be made on the long-term effects on the patient empowerment levels. A subsequent study would be needed to determine whether patient empowerment levels dropped (soon) after the intervention ended.

The main result of the master thesis shows that the provision of a learning video in combination with a smart speech assistant quiz can improve the patient empowerment levels before unplanned inpatient stays (including “healthy” people, without chronical illnesses). No assumptions can be made on whether there the same intervention would have affected chronically ill persons differently, a subsequent study on this topic would be needed.

A learning video combined with a smart speech assistant quiz appears to be a valuable way to convey health information. The full potential of activities on this field is certainly not yet met. Hope remains that further research and (technical) developments continue to positively contribute to the goal of empowering patients and thereby increasing patient safety and improving health outcomes. It has been noted that no one is completely health literate, and people can only be empowered to a certain extent (and only if they wish to). Moreover, to achieve a sustainable impact on the field, not only (potential) patients must be targeted with different instruments, but also health-professionals and policy makers, as all of them are part of the patient empowerment process.

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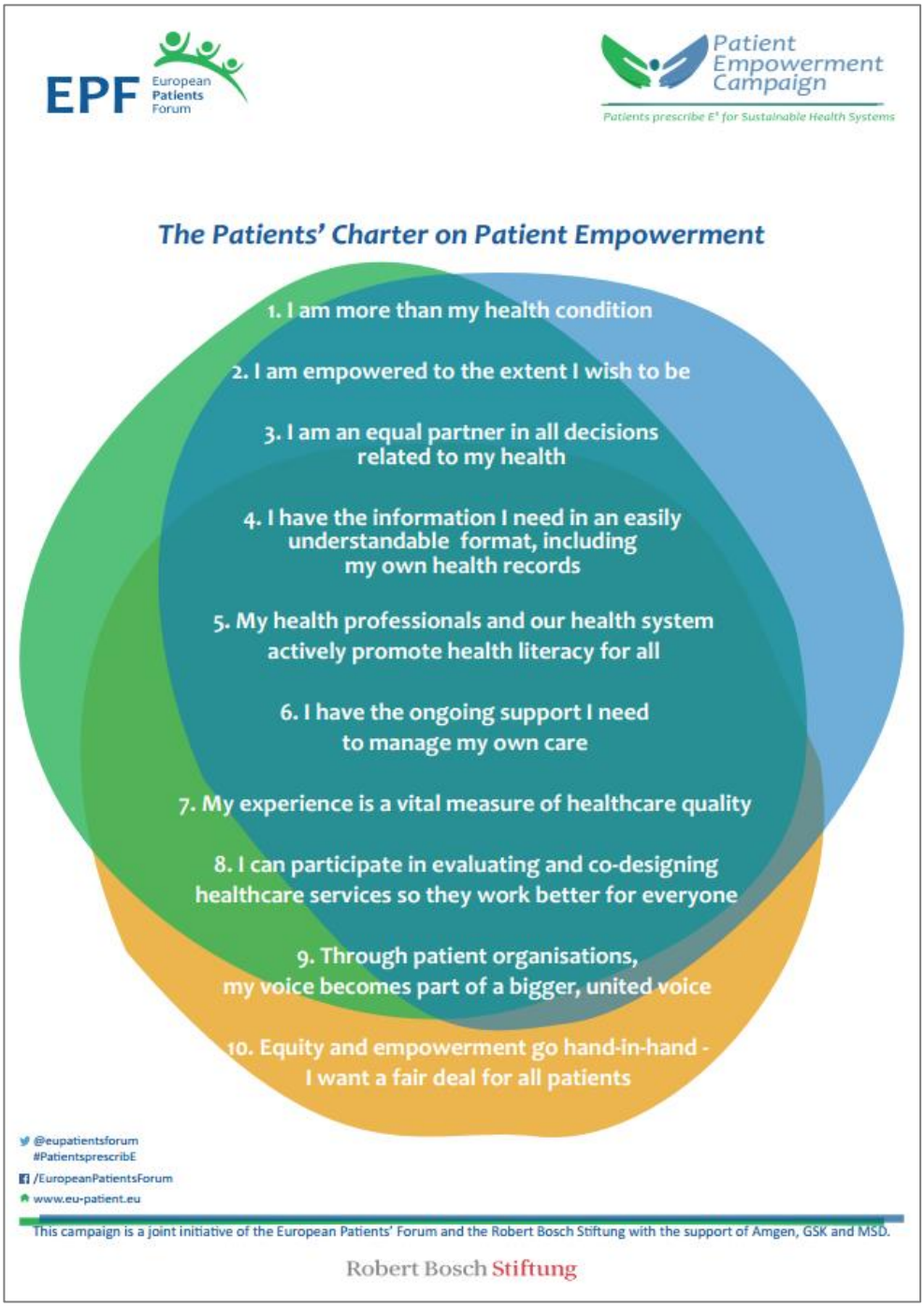
# Appendix

## A. Patient Charter

EPF patient charter (see Chapter 2.1) 1/2



EPF patient charter (see Chapter 2.1) 2/2

# The Patients' Charter on Patient Empowerment

### 1. I am more than my health condition

Healthcare is fundamentally about human interactions. Being treated with respect, dignity and compassion and being seen as a human being with a life beyond one's health condition or status is a starting point of empowerment.

### 2. I am empowered to the extent I wish to be

No-one is beyond empowerment, though some people may need more support. The right strategies should be adopted for specific needs, particularly to encourage the voices of those who may be in a vulnerable or marginalised situation. All patients should be supported and enabled to have a say in their care, according to their capabilities and wishes, and regardless of our age, gender, ability, ethnic origin, religion or belief, socio-economic situation, sexual/gender orientation, identity, expression or characteristics. If patients wish to delegate a decision to someone else, this should be respected.

### 3. I am an equal partner in all decisions related to my health

All health-related decisions, whether long-term care planning for complex needs or one-off treatment/prevention decisions, should be the result of a shared decision-making process between the patient and the healthcare team. Patients manage their chronic condition themselves most of the time. Patients and professionals need to build a relationship based on mutual respect, share information and engage as equal partners in dialogue about treatment preferences, priorities and values.

### 4. I have the information I need in an easily understandable format, including my own health records

Patients have the right to receive information they need and want, in the right amount and format and at the right time, in simple enough language to enable them to make choices according to their wishes. The right not to receive information should be respected. In addition, patients should be able to freely access their own health records and be considered the co-owner of their data, having a say in how that data is shared and used. Information for patients should be co-designed with patients to ensure it is good quality.

### 5. My health professionals and our health system actively promote health literacy for all

Health literacy is more than information: it is about being able to search out, judge and use health information to make good health decisions in all areas of life. Low health literacy affects health and can reinforce other inequalities. It is an individual challenge but also a system challenge: healthcare professionals, organisations and systems are often difficult for people to "navigate": they need to adapt so that all users, including people with lower health literacy, are able to understand and easily access the services they need.

### 6. I have the ongoing support I need to manage my own care

Individual patients' needs to manage their care and life in the context of their personal values, goals, family and other circumstances should be at the centre of a joined-up approach to care. Patients and families should be offered all relevant options in order to make meaningful choices, and the health/social care team should include the right roles, skills and knowledge to support effective self-management. Self-management education should be made widely available in the community as part of integrated chronic disease care.

### 7. My experience is a vital measure of healthcare quality

The patient experience should be adopted as a key metric in assessing the quality of healthcare. This does not mean tick-box exercises such as "satisfaction surveys", but meaningful – including qualitative – patient-centred measures. Indicators for assessing the quality of healthcare should be defined also by patients themselves, and not only by what providers assume is important for patients. Patients' feedback should be actively encouraged, listened to, and acted upon.

### 8. I can participate in evaluating and co-designing healthcare services so they work better for everyone

Meaningful patient involvement as defined by EPF is based on the premise that patients have a unique expertise and knowledge: only the patient sees "the whole journey." Patients can identify gaps in provision, but also superfluous or unwanted services, helping make healthcare more effective and efficient. Patients also have a fundamental democratic right to be represented at all levels of the planning, delivery and review of healthcare services, policy and legislation; their involvement should be built into formal structures and processes, and it should be valued.

### 9. Through patient organisations, my voice becomes part of a bigger, united voice

Individual patients can be powerful advocates based on their own personal experiences and circumstances. In addition, patient organisations put forward views representing a constituency of patients, through a consultative, democratic process. Patient organisation representatives are chosen to represent patients' views at the policy level, and they understand that they are representing a broader perspective. Patient organisations should be systematically supported , including financially, so they can accomplish these tasks effectively.

### 10. Equity and empowerment go hand-in-hand - I want a fair deal for all patients

To be an empowered patient, one first needs access to high-quality care. Many patients are not getting even basic treatment. Our vision as a patient community is for all patients to have equitable access, without discrimination, to high-quality health and social care that is designed to meet their needs. This requires political change to ensure the rights of all patients are respected, to fight the inequalities that persist in health across the EU, and to make health a priority in all policies at national and EU levels.

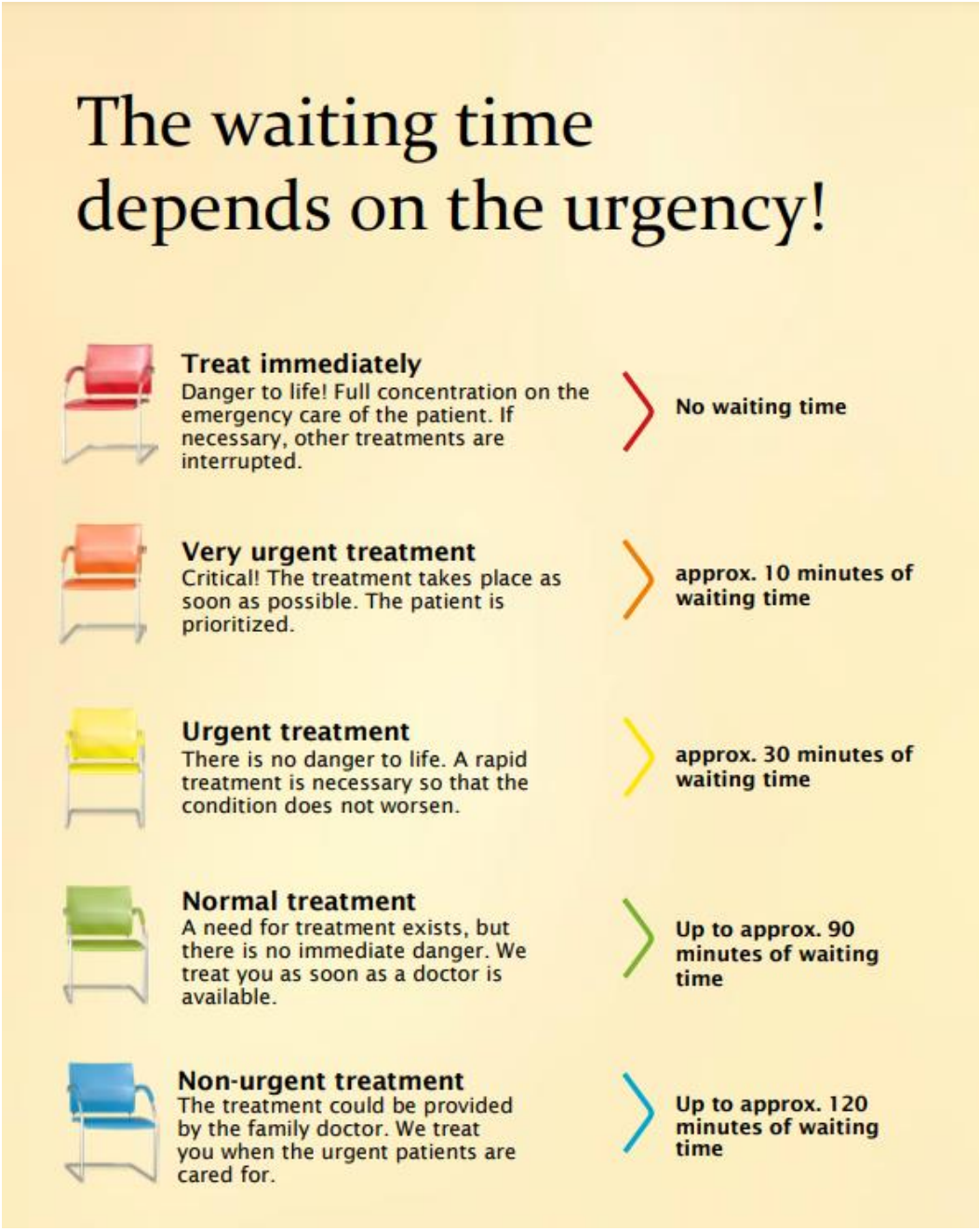
**#PatientsprescribE**

# B. Good health information examples

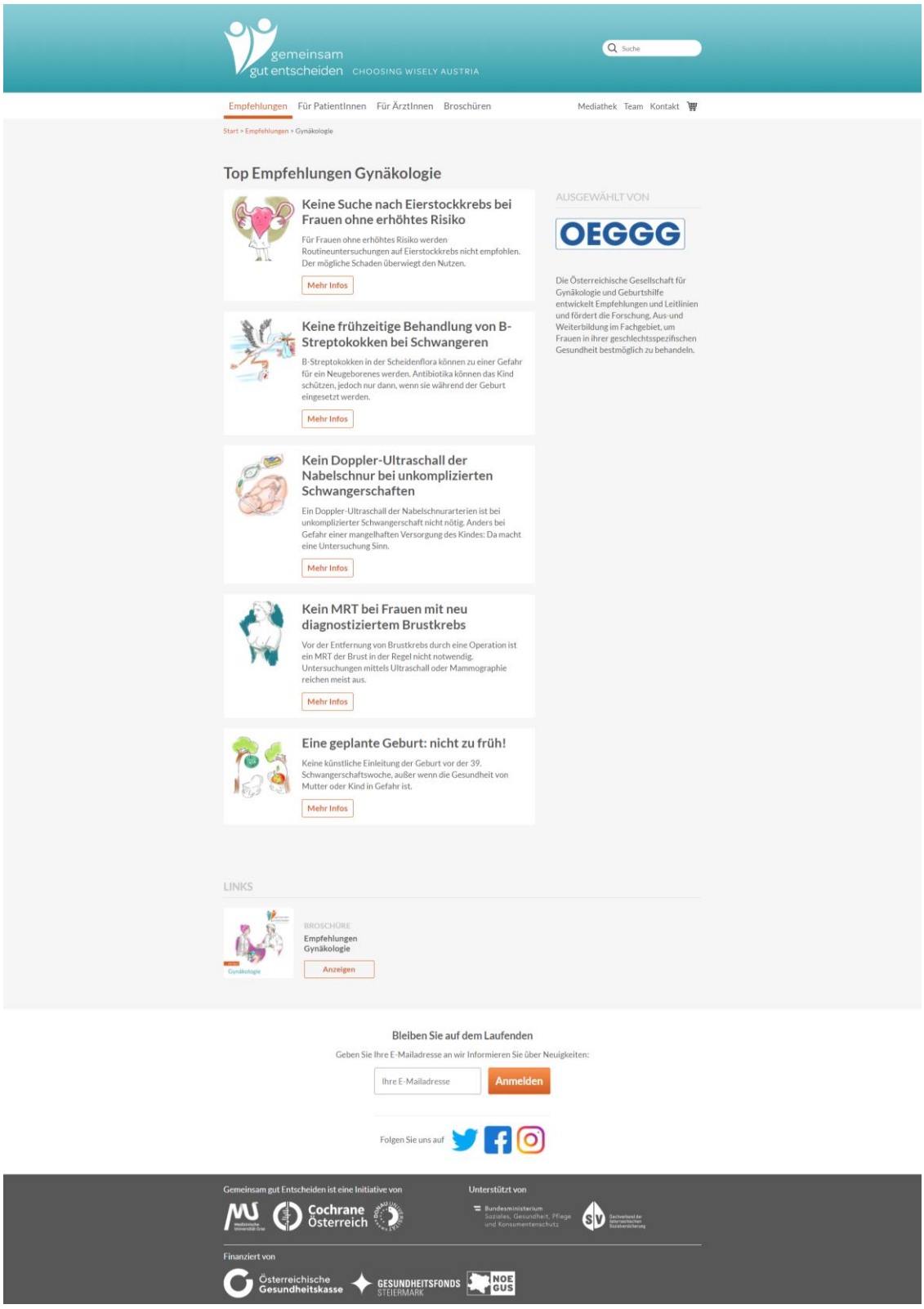
Good health information example „wobinichrichtig." (Chapter 2.1.3.3):

Good health information example „wobinichrichtig." (Chapter 2.1.3.3), English PDF-version 1/2:

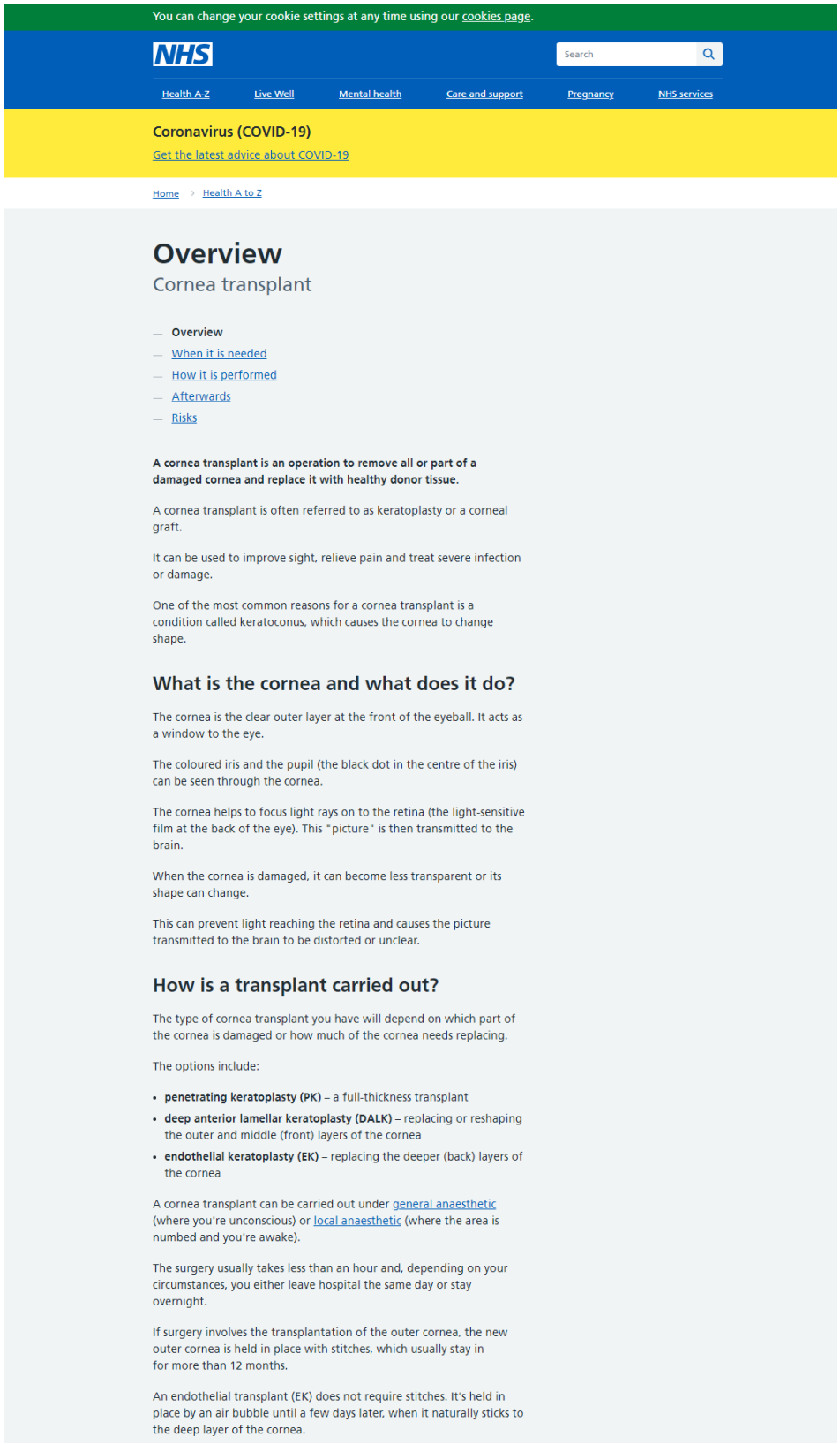
Good health information example „wobinichrichtig." (Chapter 2.1.3.3), English PDF-version 2/2:



Good health information example „gemeinsam-gut-entscheiden.at“ (Chapter 2.1.3.3):



Good health information example: NHS - cornea transplant (divided in two separate images) (Chapter 2.1.3.3):



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# Overview

## Cornea transplant

- **Overview**
- When it is needed
- How it is performed
- Afterwards
- Risks

**A cornea transplant is an operation to remove all or part of a damaged cornea and replace it with healthy donor tissue.**

A cornea transplant is often referred to as keratoplasty or a corneal graft.

It can be used to improve sight, relieve pain and treat severe infection or damage.

One of the most common reasons for a cornea transplant is a condition called keratoconus, which causes the cornea to change shape.

### What is the cornea and what does it do?

The cornea is the clear outer layer at the front of the eyeball. It acts as a window to the eye.

The coloured iris and the pupil (the black dot in the centre of the iris) can be seen through the cornea.

The cornea helps to focus light rays on to the retina (the light-sensitive film at the back of the eye). This "picture" is then transmitted to the brain.

When the cornea is damaged, it can become less transparent or its shape can change.

This can prevent light reaching the retina and causes the picture transmitted to the brain to be distorted or unclear.

### How is a transplant carried out?

The type of cornea transplant you have will depend on which part of the cornea is damaged or how much of the cornea needs replacing.

The options include:

- **penetrating keratoplasty (PK)** – a full-thickness transplant
- **deep anterior lamellar keratoplasty (DALK)** – replacing or reshaping the outer and middle (front) layers of the cornea
- **endothelial keratoplasty (EK)** – replacing the deeper (back) layers of the cornea

A cornea transplant can be carried out under general anaesthetic (where you're unconscious) or local anaesthetic (where the area is numbed and you're awake).

The surgery usually takes less than an hour and, depending on your circumstances, you either leave hospital the same day or stay overnight.

If surgery involves the transplantation of the outer cornea, the new outer cornea is held in place with stitches, which usually stay in for more than 12 months.

An endothelial transplant (EK) does not require stitches. It's held in place by an air bubble until a few days later, when it naturally sticks to the deep layer of the cornea.

## Are there any risks?

As with all types of surgery, there is a risk of complications resulting from a cornea transplant.

These can include the new cornea being rejected by the body, infection and further vision problems.

Most cornea transplants are successful and will work without complications for at least 10 years.

## After a cornea transplant

The recovery time for a cornea transplant depends on the type of transplant you have.

It takes about 18 months to enjoy the final results of a full-thickness transplant, although it's usually possible to provide glasses or a contact lens much earlier.

Recovery is usually faster after replacing just the outer and middle layers (DALK).

Endothelial transplants (EK) tend to have a faster recovery time of months or even weeks.

It's important to take good care of your eye to improve your chances of a good recovery.

This means not rubbing your eye and avoiding activities such as contact sports and swimming until you're told it's safe.

## Cornea donation

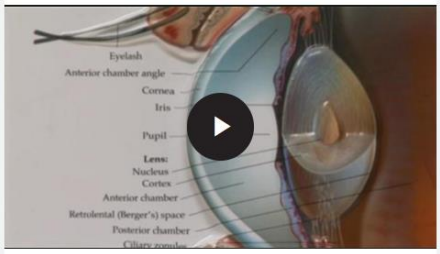
There is a shortage of donated corneas in the UK. Many more people would benefit from sight-saving surgery if more corneas were donated.

Register to become an organ donor

You can also call 0300 123 2323 if you wish to join the Organ Donor Register.

### Video: Cornea transplant

In this video, an ophthalmologist talks about the reasons for a cornea transplant, as well as what to expect.




Media last reviewed: 16 April 2021
Media review due: 16 April 2024

Page last reviewed: 13 July 2021
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# C. Questionnaires

Introduction:

*Warm welcome!*

*Thank you for taking the time to participate in this study. The participation is voluntary and can be terminated at any time without giving a reason, you will not suffer any disadvantages as a result. The goal of the study is finding out whether a learning video combined with an interactive audio-quiz can positively influence the patient empowerment level. To participate you must be over 18 years old. Unfortunately, if you work as a doctor or in nursing, you cannot participate. Participation is also not possible if you are in the hospital regularly (= at least one stay in the last year and/or a planned stay in the next two weeks) due to a chronic illness, e.g., diabetes. Your data will be treated confidentially and will only be used as part of my master's thesis, which I am writing as part of the Digital Health master's degree at the St. Pölten University of Applied Sciences. This questionnaire is the first part of a three-part intervention. It takes about 5 minutes to fill out. After you have filled out this questionnaire, you will be provided with a video and an interactive audio quiz. To take the quiz, you'll need access to an Amazon account and a device or app that allows you to play the quiz (more on that later). Please watch the video as often as possible over the next two weeks (at least once, please) and take the quiz in between (at least once, please). After the two weeks, you will be sent another questionnaire. I am available for questions on 06641265487 or at schauerhofer.theresia@gmx.at.*

Declaration of consent:

*I agree to participate in the online surveys and the interventions (video and interactive audio quiz) on the topic "Influence of a learning video in combination with an interactive audio quiz on the patient empowerment level". I have read the information above and agree to the conditions. I can (see exclusion criteria in the introduction) and agree to take part in the study. I clarified any open questions with the study director. I have been informed that my participation is voluntary and that I have the right to withdraw at any time without giving a reason and without any disadvantages as a result. I agree that the data collected as part of the study is anonymised and used and processed exclusively for the scientific purposes mentioned above.*

Pre intervention questionnaire in German (see Chapter 3.3)

Part 1/6

# Einfluss eines Lernvideos in Kombination mit einem interaktiven Audio-Quiz auf das Patient Empowerment Level

**Herzlich Willkommen!**

Vielen Dank, dass du dir Zeit nimmst an dieser Studie teilzunehmen.

Die Teilnahme ist freiwillig und du kannst diese jederzeit ohne Angabe von Gründen beenden, dir entstehen dadurch keinerlei Nachteile.

Ziel der Studie ist es, herauszufinden, ob ein Video in Kombination mit einem interaktiven Audio-Quiz das Patienten Empowerment-Level positiv beeinflussen kann.

Um teilnehmen zu können, musst du über 18 Jahre alt sein. Wenn du als Arzt oder Ärztin oder in der Pflege tätig bist, kannst du leider nicht teilnehmen. Eine Teilnahme ist leider auch nicht möglich, wenn du aufgrund einer chronischen Erkrankung regelmäßig (= mindestens ein Aufenthalt im letzten Jahr und/oder ein geplanter Aufenthalt in den nächsten zwei Wochen) im Krankenhaus bist, z.B. wegen Diabetes.

Deine Daten werden vertraulich behandelt und nur im Rahmen meiner Masterthesis, die ich im Rahmen des Digital Health Masterstudiums an der FH St. Pölten verfasse, verwendet.

Dieser Fragebogen ist der erste Teil einer dreiteiligen Intervention. Das Ausfüllen dauert ca. 5 Minuten.

Nachdem du diesen Fragebogen befüllt hast, wird dir ein Video sowie ein interaktives Audio-Quiz zur Verfügung gestellt. Für das Quiz brauchst du Zugriff auf ein Amazon Konto sowie ein Gerät oder eine App mit der du das Quiz abspielen kannst (mehr dazu erfährst du später).

Bitte schau dir das Video in den nächsten zwei Wochen so oft wie möglich an (bitte mindestens einmal) und mach dazwischen auch immer wieder das Quiz (bitte mindestens einmal).

Nach den zwei Wochen wird dir erneut ein Fragebogen zugeschickt.

**Für Fragen stehe ich**
unter 0664 12 654 87
oder unter schauerhofer.theresia@gmx.at
**gerne zur Verfügung!**
*Theresia Schauerhofer*

Part 2/6

**1. Einwilligungserklärung**

Ich bin damit einverstanden, an den online Befragungen und den Interventionen (Video und interaktives Audio-Quiz) zum Thema „Einfluss eines Lernvideos in Kombination mit einem interaktiven Audio-Quiz auf das Patient Empowerment Level", teilzunehmen.

Ich habe die obenstehende Information gelesen, bin mit den Bedingungen einverstanden. Ich kann (siehe Ausschlusskriterien in der Einleitung) und möchte an der Studie teilnehmen. Eventuell offene Fragen habe ich mit der Studienleitung geklärt. Ich wurde darauf hingewiesen, dass meine Teilnahme freiwillig ist und dass ich das Recht habe, diese jederzeit ohne Angabe von Gründen zu beenden, ohne dass mir dadurch Nachteile entstehen.

Ich bin damit einverstanden, dass die im Rahmen der Studie erhobenen Daten anonymisiert und ausschließlich für die oben genannten wissenschaftlichen Zwecke verwendet und verarbeitet werden dürfen.

☐ Ich erkläre hiermit meine freiwillige Teilnahme an dieser Studie.

Frage 2.

**2. Bist/warst du in der Pflege oder als Ärztin/Arzt tätig?**

Wenn du in der Pflege oder als Ärztin/Arzt tätig bist/warst, kannst du leider nicht an der Untersuchung teilnehmen.

◯ Ja ◯ Nein

Frage 3.

**3. Warst du aufgrund einer chronischen Erkrankung regelmäßig (= mindestens ein Aufenthalt im letzten Jahr und/oder ein geplanter Aufenthalt in den nächsten zwei Wochen) im Krankenhaus bist, z.B. wegen Diabetes.**

Wenn du wenn du aufgrund einer chronischen Erkrankung regelmäßig im Krankenhaus bist, kannst du leider nicht an der Untersuchung teilnehmen.

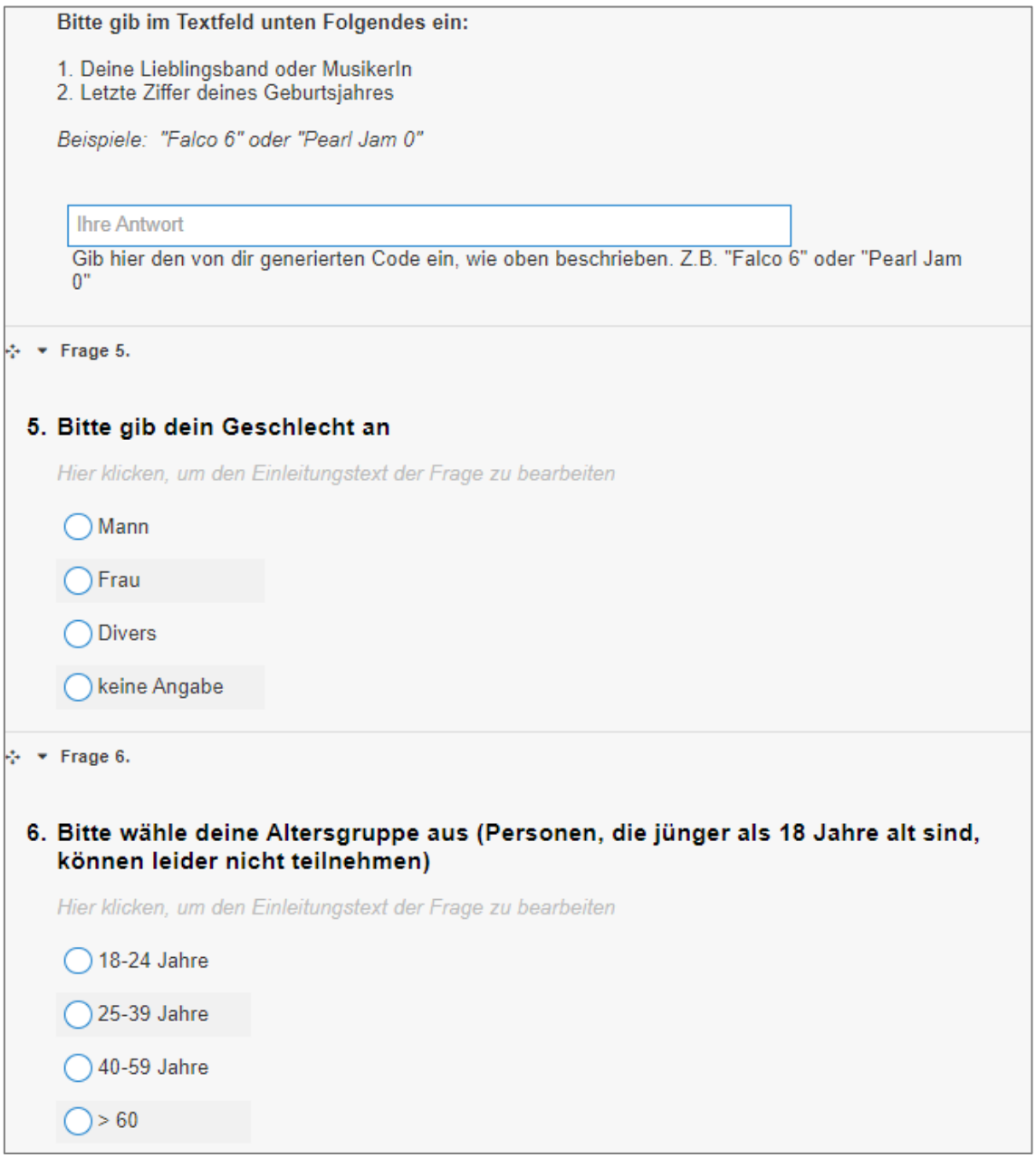
◯ Ja ◯ Nein

Frage 4.

**4. Bitte generiere einen persönlichen Code**

Zur Auswertung der in der Studie erhobenen Daten ist es wichtig, dass es nachvollziehbar ist, welche Fragebögen zusammengehören und wie oft das Quiz von der jeweiligen Person genutzt wurde. Damit du anonym bleibst, muss ein persönlicher Code generiert werden, der keine direkten Rückschlüsse auf dich zulässt. Du wirst auch im Quiz und im zweiten Fragebogen nochmal nach diesem Code gefragt.

Part 3/6


Bitte gib im Textfeld unten Folgendes ein:
1. Deine Lieblingsband oder MusikerIn
2. Letzte Ziffer deines Geburtsjahres
Beispiele: "Falco 6" oder "Pearl Jam 0"
Ihre Antwort
Gib hier den von dir generierten Code ein, wie oben beschrieben. Z.B. "Falco 6" oder "Pearl Jam 0"
Frage 5.
5. Bitte gib dein Geschlecht an
Hier klicken, um den Einleitungstext der Frage zu bearbeiten
Mann
Frau
Divers
keine Angabe
Frage 6.
6. Bitte wähle deine Altersgruppe aus (Personen, die jünger als 18 Jahre alt sind, können leider nicht teilnehmen)
Hier klicken, um den Einleitungstext der Frage zu bearbeiten
18-24 Jahre
25-39 Jahre
40-59 Jahre
> 60

Part 4/6

**7. Bitte gib deinen aktuell höchsten Bildungsgrad an**

*Hier klicken, um den Einleitungstext der Frage zu bearbeiten*

- ◯ Pflichtschulabschluss
- ◯ Matura
- ◯ Fachschule/Kolleg
- ◯ Studium (Fachhochschule, Universität)

Frage 8.

**8. Bitte gib an wie sehr du den untenstehenden Aussagen zustimmst oder nicht zustimmst. Sei bei deiner Beantwortung so ehrlich wie möglich, es gibt hier kein richtig oder falsch!**

*Hier klicken, um den Einleitungstext der Frage zu bearbeiten*

| | Stimme überhaupt nicht zu | Stimme nicht zu | Stimme weder zu, noch lehne ich ab | Stimme zu | Stimme voll und ganz zu |
|---|---|---|---|---|---|
| Wenn ich krank oder verletzt bin, sind meine ÄrztInnen, Krankenpflegepersonen und/oder andere medizinische Fachkräfte allein dafür verantwortlich, sich um meinen Gesundheitszustand zu kümmern. | ◯ | ◯ | ◯ | ◯ | ◯ |
| Ich muss in allen Angelegenheiten, die meine Gesundheit/meine Genesung betreffen, eine aktive Rolle einnehmen. | ◯ | ◯ | ◯ | ◯ | ◯ |
| Wenn mir mein Arzt Medikamente verschreibt, informiere ich mich immer ausführlich darüber (z. B. (Neben-)Wirkungen). | ◯ | ◯ | ◯ | ◯ | ◯ |
| Es ist wichtig, über alle Aspekte seines Gesundheitszustands informiert zu sein. | ◯ | ◯ | ◯ | ◯ | ◯ |
| Wenn ich etwas nicht verstehe, was mir eine Krankenpflegeperson, ein/e Ärztin, ein/e Therapeutin oder eine andere medizinische Fachkraft erklärt, stelle ich so lange Fragen, bis ich es verstehe. | ◯ | ◯ | ◯ | ◯ | ◯ |
| Wenn ich Zweifel an einer gesundheitsbezogenen Entscheidung habe, äußere ich das immer gegenüber Krankenpflegepersonen, ÄrztInnen, TherapeutInnen und/oder anderen medizinischen Fachkräften. | ◯ | ◯ | ◯ | ◯ | ◯ |

Part 5/6

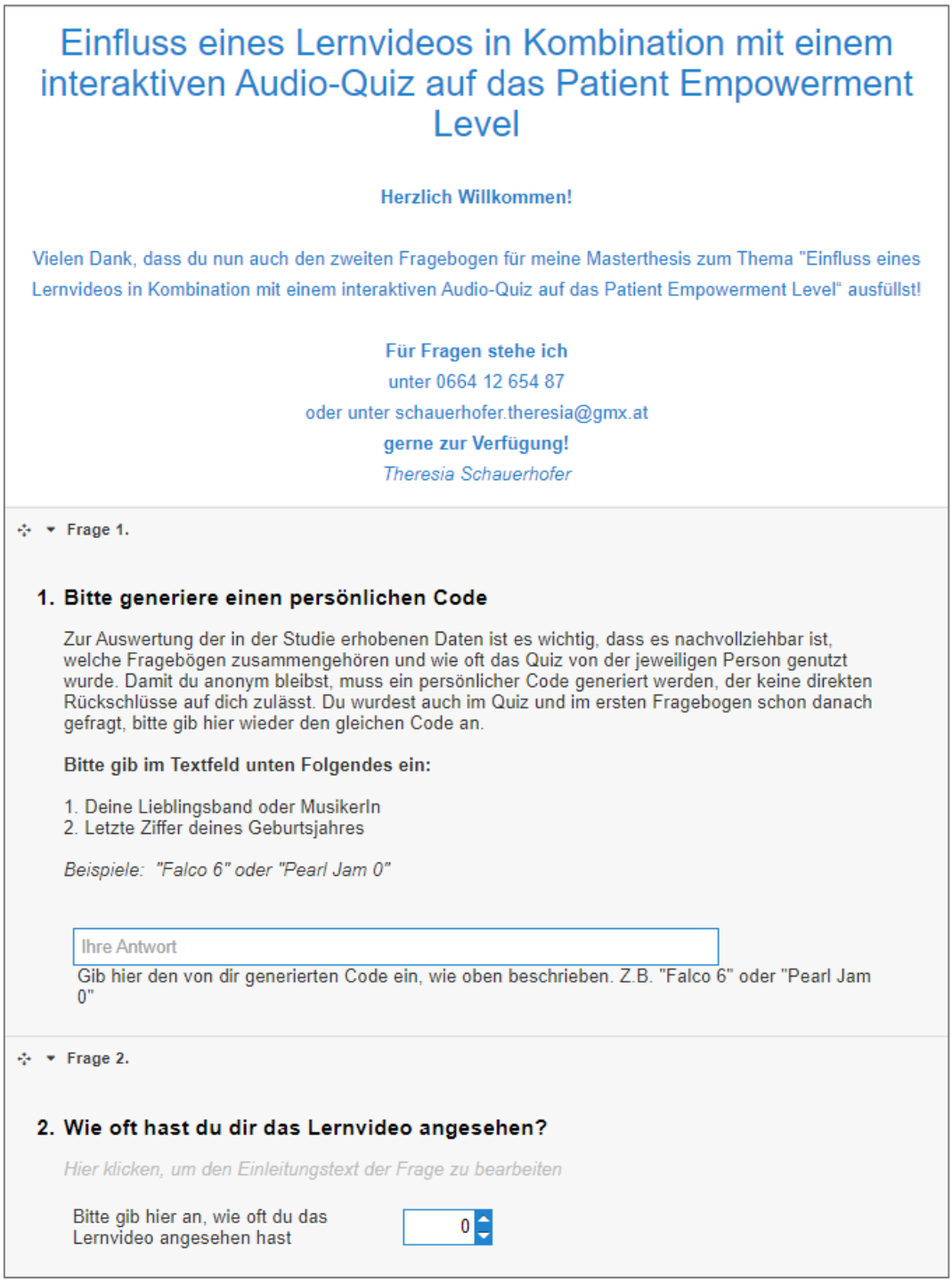
| | Stimme überhaupt nicht zu | Stimme nicht zu | Stimme weder zu, noch lehne ich ab | Stimme zu | Stimme voll und ganz zu |
|---|---|---|---|---|---|
| Wenn ich krank oder verletzt bin, informiere ich mich über die verschiedenen Behandlungsmöglichkeiten und bespreche Sie mit meinem/meiner Arzt/Ärtzin. | ○ | ○ | ○ | ○ | ○ |
| Es ist wichtig, sich an allen gesundheitsbezogenen Entscheidungen aktiv zu beteiligen. | ○ | ○ | ○ | ○ | ○ |
| Wenn ich krank bin, informiere ich mich immer über die Ursachen meiner Erkrankung. | ○ | ○ | ○ | ○ | ○ |
| Ich lasse Krankenpflegepersonen, ÄrtzInnen, TherapeutInnen und/oder andere medizinische Fachkräfte alle gesundheitsbezogene Entscheidungen für mich treffen. | ○ | ○ | ○ | ○ | ○ |
| Man kann seine Genesung und sein Wohlbefinden immer aktiv beeinflussen. | ○ | ○ | ○ | ○ | ○ |
| Ich frage Familienangehörige oder FreundInnen, wenn ich Unterstützung (betreffend meine Gesundheit/Genesung) brauche. | ○ | ○ | ○ | ○ | ○ |
| Ich würde das Krankenpflegepersonal, ÄrtzInnen, TherapeutInnen und/oder andere medizinische Fachkräfte sofort informieren, wenn ich das Gefühl hätte das etwas nicht stimmt oder ich Schmerzen habe. | ○ | ○ | ○ | ○ | ○ |
| Nur Krankenpflegepersonen, ÄrtzInnen, TherapeutInnen und/oder andere medizinische Fachkräfte wissen, was für mich am besten ist, wenn ich krank oder verletzt bin. | ○ | ○ | ○ | ○ | ○ |
| Ich stelle immer sicher, dass alle medizinischen Fachkräfte meine Vorbefunde und alle wichtigen Informationen zu meiner Gesundheit erhalten. | ○ | ○ | ○ | ○ | ○ |
| Wenn mir eine medizinische Fachkraft Medikamente gibt, schaue ich immer genau nach was es ist, bevor ich etwas einnehme. | ○ | ○ | ○ | ○ | ○ |
| Bei einer Blutabnahme stelle ich immer sicher, dass meine Identität davor überprüft wurde. | ○ | ○ | ○ | ○ | ○ |

Part 6/6


Ich weiß, dass ich meine Meinung hinsichtlich einer gewählten Therapieoption jederzeit ändern kann.
Stimme überhaupt nicht zu
Stimme nicht zu
Stimme weder zu, noch lehne ich ab
Stimme zu
Stimme voll und ganz zu
Textblock
Danke, dass du alle obenstehenden Fragen beantwortet hast!
Das Quiz kannst du mit allen Geräten starten, auf denen Alexa verfügbar ist. Sag einfach: "Alexa, starte Sicher Gesund". Eine detaillierte Start-Anleitung wird dir gesondert zur Verfügung gestellt. Mach das Quiz in den nächsten zwei Wochen so oft wie möglich, aber bitte mindestens einmal.
Hier findest du den Link zum Video: https://www.youtube.com/watch?v=83qlW2ya7Yg
Schau das Video in den nächsten zwei Wochen so oft wie möglich, aber bitte mindestens einmal.
Du hast bis zum 18.03.2022 Zeit mit dem Quiz zu üben und das Video zu schauen. Am 18.03.2022 wird der zweite Fragebogen zum Abschluss der Studie zur Verfügung gestellt.
Das versprochene Video und das Quiz werden zusätzlich auch mittels eigener Links zur Verfügung gestellt.
Für Fragen stehe ich
unter 0664 12 654 87
oder unter schauerhofer.theresia@gmx.at
gerne zur Verfügung!
Theresia Schauerhofer

Post intervention questionnaire in German (see Chapter 3.3)

Part 1/5



# Einfluss eines Lernvideos in Kombination mit einem interaktiven Audio-Quiz auf das Patient Empowerment Level

**Herzlich Willkommen!**

Vielen Dank, dass du nun auch den zweiten Fragebogen für meine Masterthesis zum Thema "Einfluss eines Lernvideos in Kombination mit einem interaktiven Audio-Quiz auf das Patient Empowerment Level" ausfüllst!

**Für Fragen stehe ich**
unter 0664 12 654 87
oder unter schauerhofer.theresia@gmx.at
**gerne zur Verfügung!**
*Theresia Schauerhofer*

Frage 1.

**1. Bitte generiere einen persönlichen Code**

Zur Auswertung der in der Studie erhobenen Daten ist es wichtig, dass es nachvollziehbar ist, welche Fragebögen zusammengehören und wie oft das Quiz von der jeweiligen Person genutzt wurde. Damit du anonym bleibst, muss ein persönlicher Code generiert werden, der keine direkten Rückschlüsse auf dich zulässt. Du wurdest auch im Quiz und im ersten Fragebogen schon danach gefragt, bitte gib hier wieder den gleichen Code an.

**Bitte gib im Textfeld unten Folgendes ein:**

1. Deine Lieblingsband oder MusikerIn
2. Letzte Ziffer deines Geburtsjahres

*Beispiele: "Falco 6" oder "Pearl Jam 0"*

Ihre Antwort

Gib hier den von dir generierten Code ein, wie oben beschrieben. Z.B. "Falco 6" oder "Pearl Jam 0"

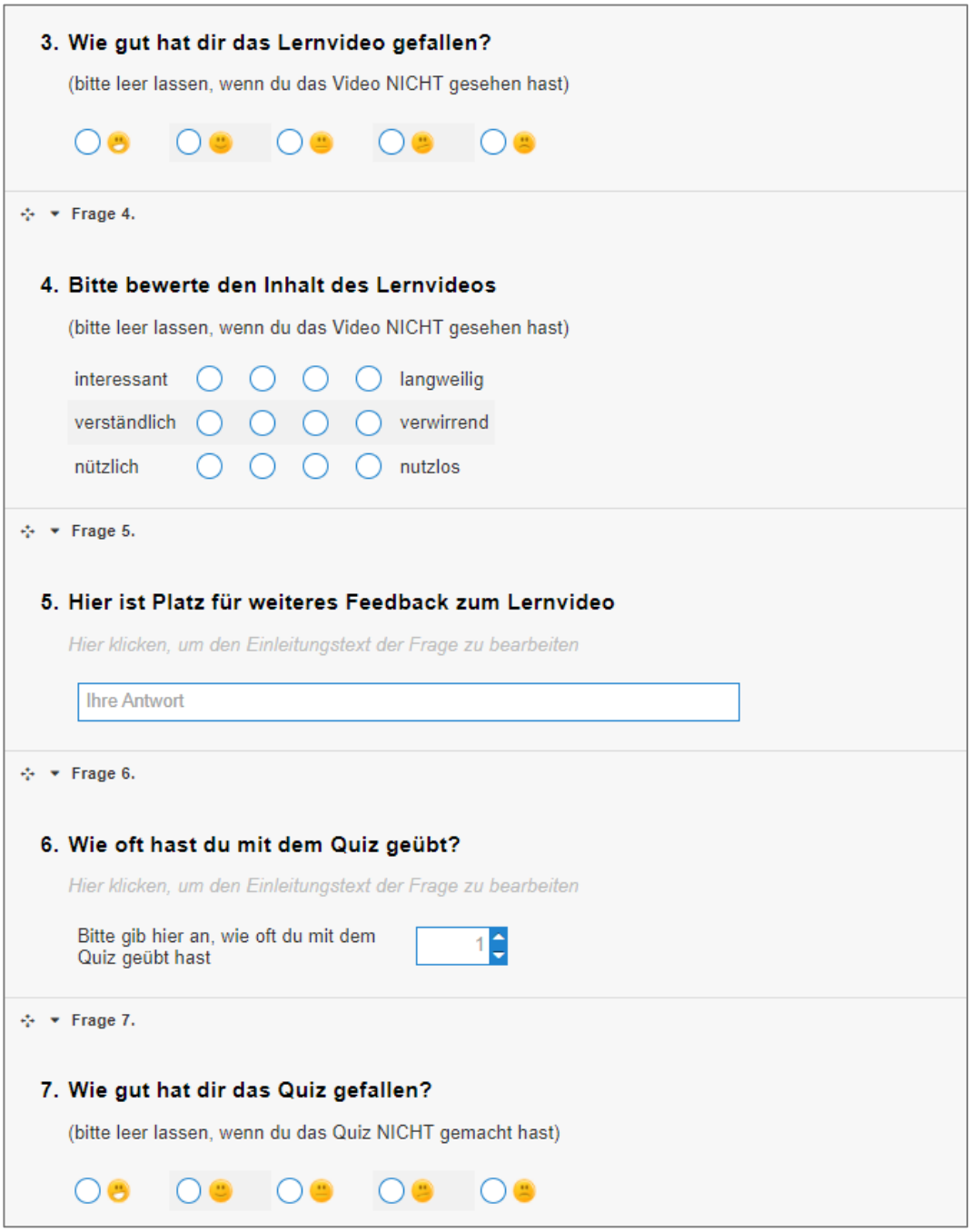
Frage 2.

**2. Wie oft hast du dir das Lernvideo angesehen?**

*Hier klicken, um den Einleitungstext der Frage zu bearbeiten*

Bitte gib hier an, wie oft du das Lernvideo angesehen hast 0

Part 2/5


3. Wie gut hat dir das Lernvideo gefallen?
(bitte leer lassen, wenn du das Video NICHT gesehen hast)
Frage 4.
4. Bitte bewerte den Inhalt des Lernvideos
(bitte leer lassen, wenn du das Video NICHT gesehen hast)
interessant
langweilig
verständlich
verwirrend
nützlich
nutzlos
Frage 5.
5. Hier ist Platz für weiteres Feedback zum Lernvideo
Hier klicken, um den Einleitungstext der Frage zu bearbeiten
Ihre Antwort
Frage 6.
6. Wie oft hast du mit dem Quiz geübt?
Hier klicken, um den Einleitungstext der Frage zu bearbeiten
Bitte gib hier an, wie oft du mit dem Quiz geübt hast
1
Frage 7.
7. Wie gut hat dir das Quiz gefallen?
(bitte leer lassen, wenn du das Quiz NICHT gemacht hast)

Part 3/5

**8. Bitte bewerte den Inhalt des Quiz'.**

(bitte leer lassen, wenn du das Quiz NICHT gemacht hast)

| | | | | | |
|---|---|---|---|---|---|
| interessant | ◯ | ◯ | ◯ | ◯ | langweilig |
| verständlich | ◯ | ◯ | ◯ | ◯ | verwirrend |
| nützlich | ◯ | ◯ | ◯ | ◯ | nutzlos |

Frage 9.

**9. Hier ist Platz für weiteres Feedback zum Quiz.**

*Hier klicken, um den Einleitungstext der Frage zu bearbeiten*

Ihre Antwort

Frage 10.

**10. Bitte gib an wie sehr du den untenstehenden Aussagen zustimmst oder nicht zustimmst. Sei bei deiner Beantwortung zu ehrlich wie möglich, es gibt hier kein richtig oder falsch!**

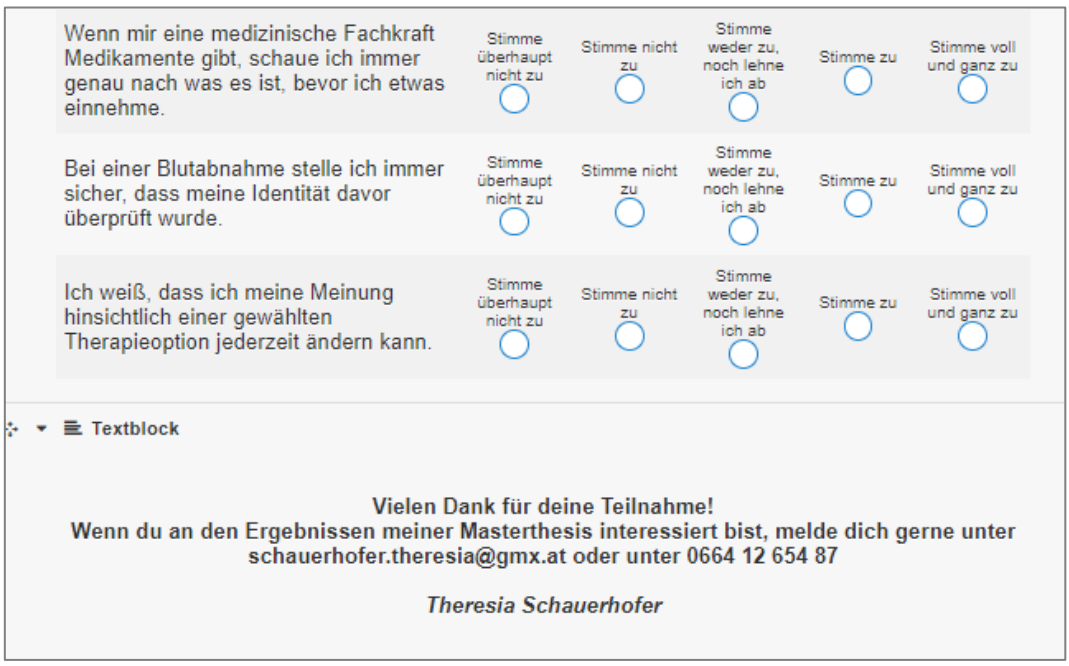
*Hier klicken, um den Einleitungstext der Frage zu bearbeiten*

| | Stimme überhaupt nicht zu | Stimme nicht zu | Stimme weder zu, noch lehne ich ab | Stimme zu | Stimme voll und ganz zu |
|---|---|---|---|---|---|
| Wenn ich krank oder verletzt bin, sind meine ÄrztInnen, Krankenpflegepersonen und/oder andere medizinische Fachkräfte allein dafür verantwortlich, sich um meinen Gesundheitszustand zu kümmern. | ◯ | ◯ | ◯ | ◯ | ◯ |
| Ich muss in allen Angelegenheiten, die meine Gesundheit/meine Genesung betreffen, eine aktive Rolle einnehmen. | ◯ | ◯ | ◯ | ◯ | ◯ |
| Wenn mir mein Arzt Medikamente verschreibt, informiere ich mich immer ausführlich darüber (z. B. (Neben-)Wirkungen). | ◯ | ◯ | ◯ | ◯ | ◯ |
| Es ist wichtig, über alle Aspekte seines Gesundheitszustands informiert zu sein. | ◯ | ◯ | ◯ | ◯ | ◯ |
| Wenn ich etwas nicht verstehe, was mir eine Krankenpflegeperson, ein/e Ärztin, ein/e Therapeutin oder eine andere medizinische Fachkraft erklärt, stelle ich so lange Fragen, bis ich es verstehe. | ◯ | ◯ | ◯ | ◯ | ◯ |

Part 4/5

| | Stimme überhaupt nicht zu | Stimme nicht zu | Stimme weder zu, noch lehne ich ab | Stimme zu | Stimme voll und ganz zu |
|---|---|---|---|---|---|
| Wenn ich Zweifel an einer gesundheitsbezogenen Entscheidung habe, äußere ich das immer gegenüber Krankenpflegepersonen, ÄrtzInnen, TherapeutInnen und/oder anderen medizinischen Fachkräften. | ○ | ○ | ○ | ○ | ○ |
| Wenn ich krank oder verletzt bin, informiere ich mich über die verschiedenen Behandlungsmöglichkeiten und bespreche Sie mit meinem/meiner Arzt/ Ärtzin. | ○ | ○ | ○ | ○ | ○ |
| Es ist wichtig, sich an allen gesundheitsbezogenen Entscheidungen aktiv zu beteiligen. | ○ | ○ | ○ | ○ | ○ |
| Wenn ich krank bin, informiere ich mich immer über die Ursachen meiner Erkrankung. | ○ | ○ | ○ | ○ | ○ |
| Ich lasse Krankenpflegepersonen, ÄrtzInnen, TherapeutInnen und/oder andere medizinische Fachkräfte alle gesundheitsbezogene Entscheidungen für mich treffen. | ○ | ○ | ○ | ○ | ○ |
| Man kann seine Genesung und sein Wohlbefinden immer aktiv beeinflussen. | ○ | ○ | ○ | ○ | ○ |
| Ich frage Familienangehörige oder FreundInnen, wenn ich Unterstützung (betreffend meine Gesundheit/Genesung) brauche. | ○ | ○ | ○ | ○ | ○ |
| Ich würde das Krankenpflegepersonal, ÄrtzInnen, TherapeutInnen und/oder andere medizinische Fachkräfte sofort informieren, wenn ich das Gefühl hätte das etwas nicht stimmt oder ich Schmerzen habe. | ○ | ○ | ○ | ○ | ○ |
| Nur Krankenpflegepersonen, ÄrtzInnen, TherapeutInnen und/oder andere medizinische Fachkräfte wissen, was für mich am besten ist, wenn ich krank oder verletzt bin. | ○ | ○ | ○ | ○ | ○ |
| Ich stelle immer sicher, dass alle medizinischen Fachkräfte meine Vorbefunde und alle wichtigen Informationen zu meiner Gesundheit erhalten. | ○ | ○ | ○ | ○ | ○ |

Part 5/5



| | | | | | |
|---|---|---|---|---|---|
| Wenn mir eine medizinische Fachkraft Medikamente gibt, schaue ich immer genau nach was es ist, bevor ich etwas einnehme. | Stimme überhaupt nicht zu | Stimme nicht zu | Stimme weder zu, noch lehne ich ab | Stimme zu | Stimme voll und ganz zu |
| Bei einer Blutabnahme stelle ich immer sicher, dass meine Identität davor überprüft wurde. | Stimme überhaupt nicht zu | Stimme nicht zu | Stimme weder zu, noch lehne ich ab | Stimme zu | Stimme voll und ganz zu |
| Ich weiß, dass ich meine Meinung hinsichtlich einer gewählten Therapieoption jederzeit ändern kann. | Stimme überhaupt nicht zu | Stimme nicht zu | Stimme weder zu, noch lehne ich ab | Stimme zu | Stimme voll und ganz zu |

# D. Original video script

Original video script in German (see Chapter 3.2):

Link to the video: https://youtu.be/83qIW2ya7Yg (published on Youtube [128])

*„Dieses Video zeigt, was du für Deine Gesundheit und Sicherheit im Krankenhaus tun kannst. Die Infos im Video sind bewusst in einfacher Sprache erklärt.*

*Das sind Elias Anna Nina und Ben. Alle vier sind im Krankenhaus.*

*Elias hat sich verbrannt, seine Frau hat ihn ins Krankenhaus gebracht. Wegen seiner Schmerzen versteht er nicht gleich alles was die Ärztin sagt. Seine Frau bleibt dabei, hört mit und hilft ihm. Es ist klug, sich in schwierigen Situationen helfen zu lassen. Du kannst immer jemanden zum Arztgespräch mitbringen - mehr Ohren hören mehr.*

*Anna hatte einen Unfall, sie war schwer verletzt und braucht nun viele Medikamente. Sie möchte gut Bescheid wissen, liest daher die Beipackzettel und fragt nach, was ihr unklar ist. Auch du, musst über deine Medikamente informiert sein. Zum Beispiel, warum wie lange und wieviel du von einer Medikament nehmen musst. Auch Wechsel- oder Nebenwirkungen musst du kennen. So merkst du rasch, wenn etwas nicht stimmt.*

*Nina braucht eine Blinddarm-OP. Sie wird davor über die OP-Methode und das Risiko aufgeklärt. Nina versteht manche der medizinischen Begriffe nicht und fragt viel nach. Auch für dich gilt: Trau dich zu fragen! Nur wer sich auskennt, kann gute Entscheidungen treffen.*

*Ben ist wegen Depressionen im Krankenhaus. Er kann sich nicht gut konzentrieren und schreibt auf, was sein Arzt sagt. So kann er sich später noch erinnern. Niemand merkt sich alles. Es ist wichtig, Dinge zu notieren, vielleicht fällt dir etwas ein, das du nicht gleich fragen kannst - schreib es für später auf.*

*Anna geht es besser. Vor der Entlassung muss ihr Blut untersucht werden. Der Pfleger überprüft davor immer ihre Identität. Anna passt auch selbst immer gut auf. Auch du musst sichergehen, dass das Personal vor Untersuchungen weiß, wer du bist, damit du nicht verwechselt wirst.*

*Elias muss noch im Krankenhaus bleiben. Er sagt dem Pfleger, dass er eine Allergie hat, obwohl die Ärztin das schon weiß. Er hat keine Angst, aber möchte sicher sein, dass nichts übersehen wird. Das gleiche gilt für dich: Das Personal muss über wichtige Dinge Bescheid wissen. Eine Allergie ist nur eines von vielen Beispielen.*

*Vieles von dem was du gehört hast, wusstest du bereits. Manches war neu. Merke dir:*

*Du musst dich aktiv an deiner Behandlung und allem was dazugehört beteiligen. Stell Fragen und äußere Zweifel, wenn du etwas nicht verstehst. Lass nicht locker, bis alle Unklarheiten beseitigt sind.*

*Mach dir beim Aufenthalt Notizen oder bring jemanden mit, dem du vertraust.*

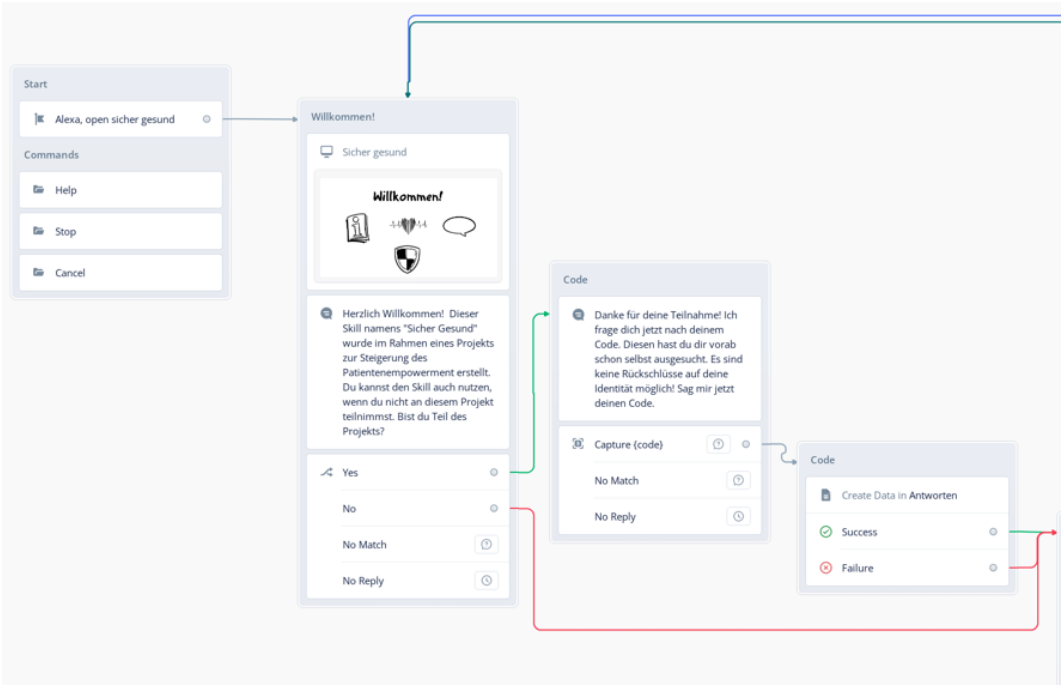
*Informiere dich über deine Medikamente und schau genau bevor, du etwas einnimmst.*

*Pass auf, dass du vom Gesundheitspersonal nicht verwechselt wirst.*

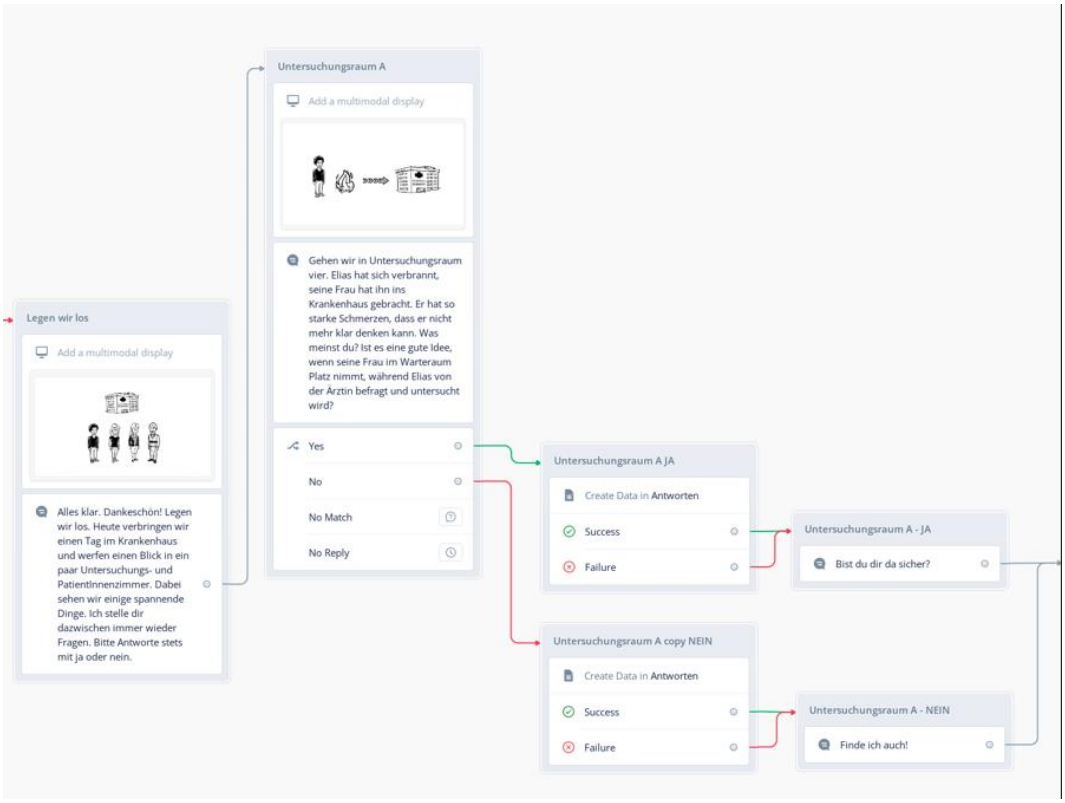
*Auch nach deiner Entlassung geht deine Genesung weiter. Hol dir alle wichtigen Infos, bevor du nach Hause gehst - es ist dein Recht!“*

# E. Quiz script and screenshots

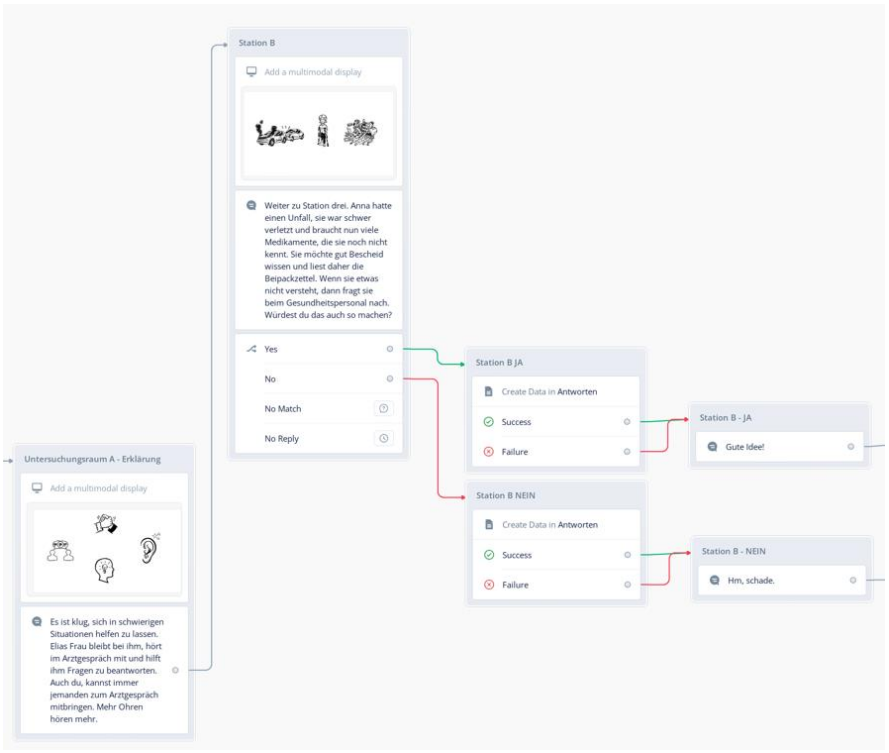
Part 1/10



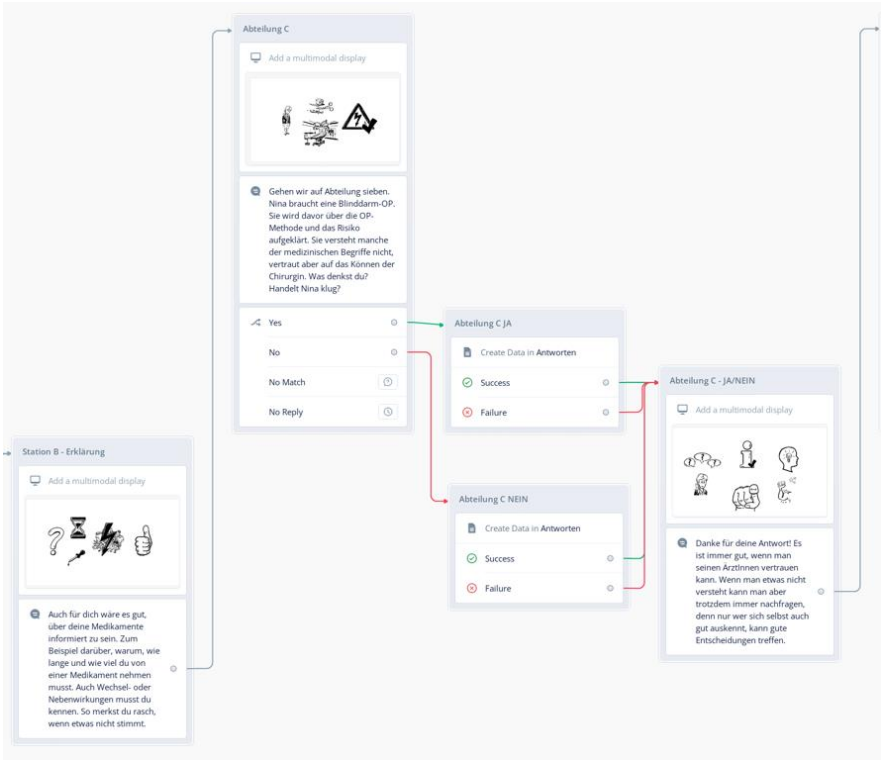

Part 2/10



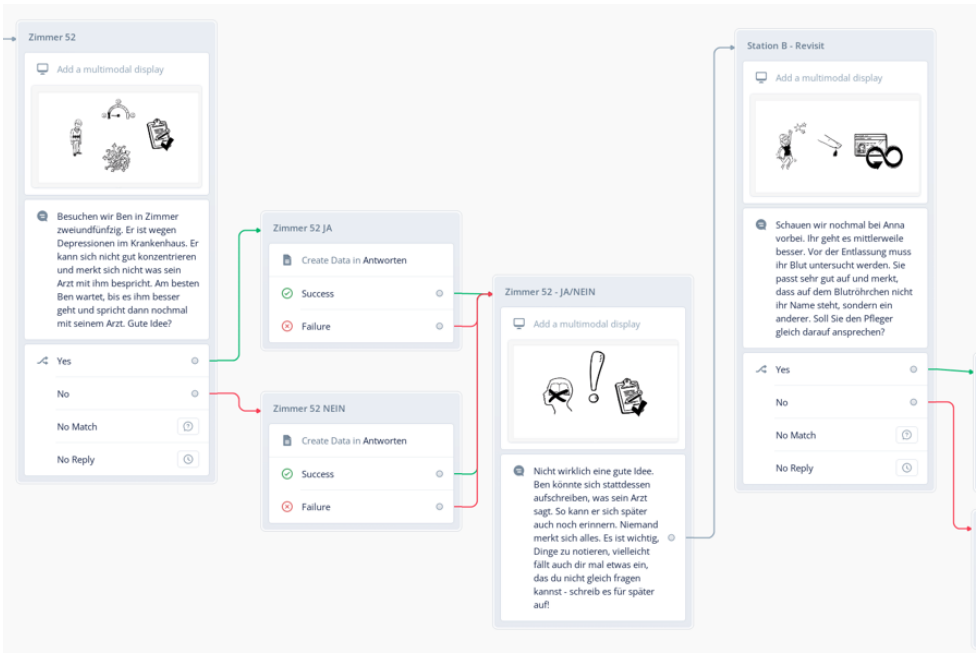
Part 3/10



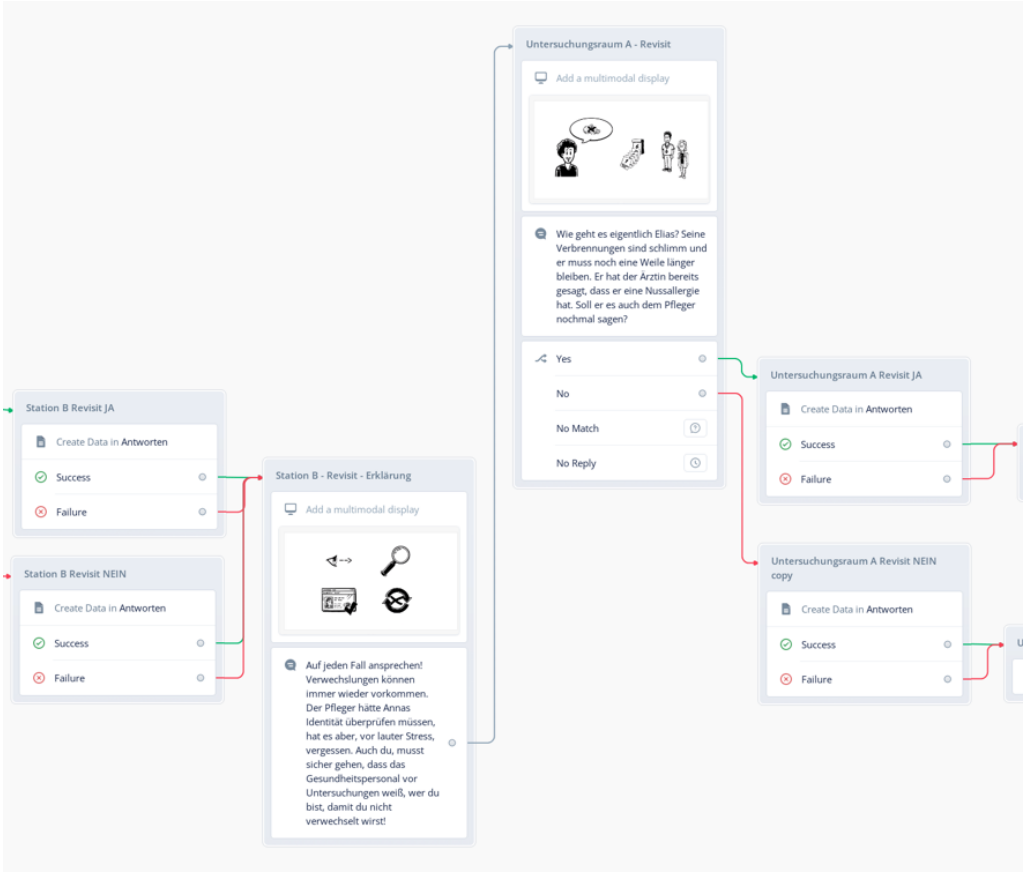

Part 4/10



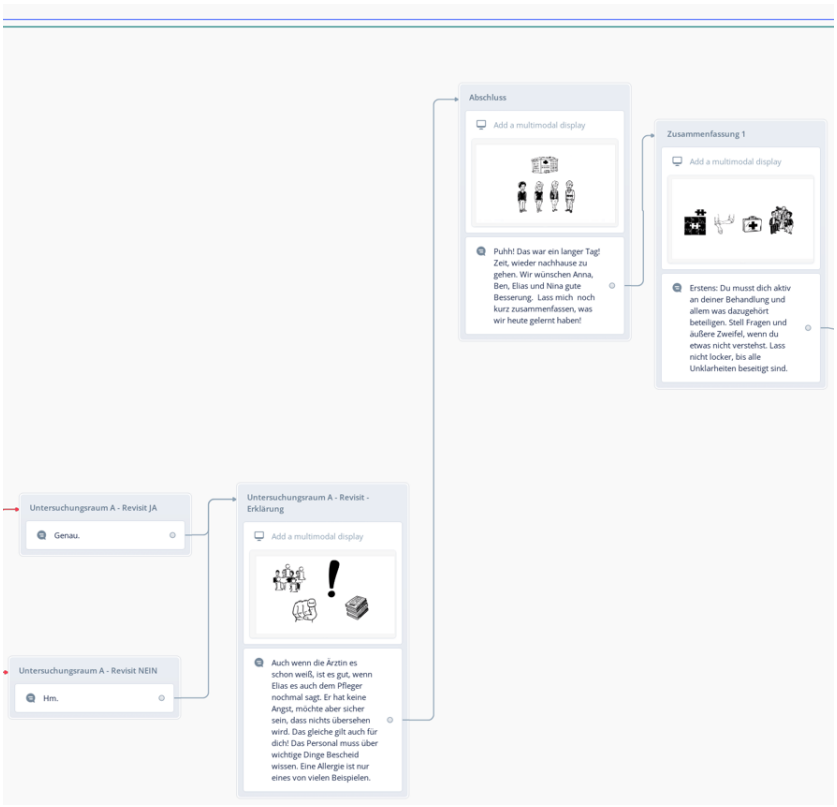
Part 5/10



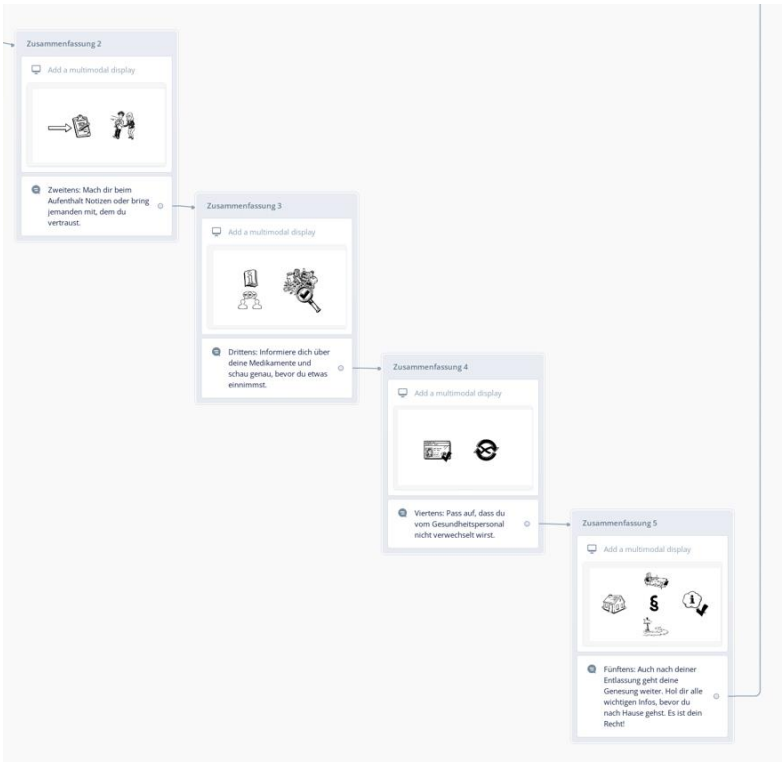

Part 6/10



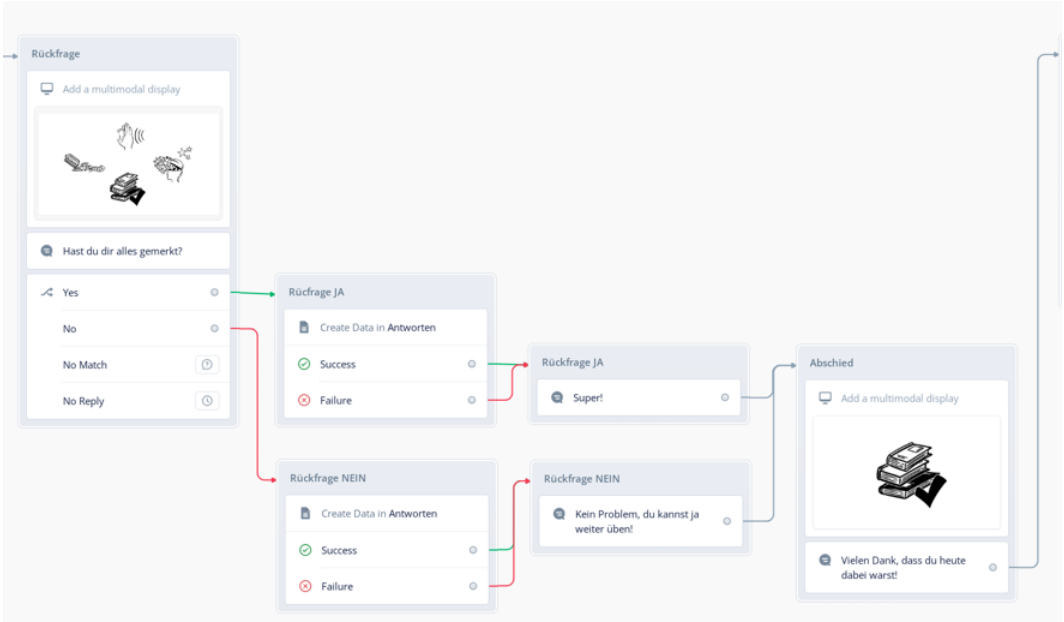
Part 7/10



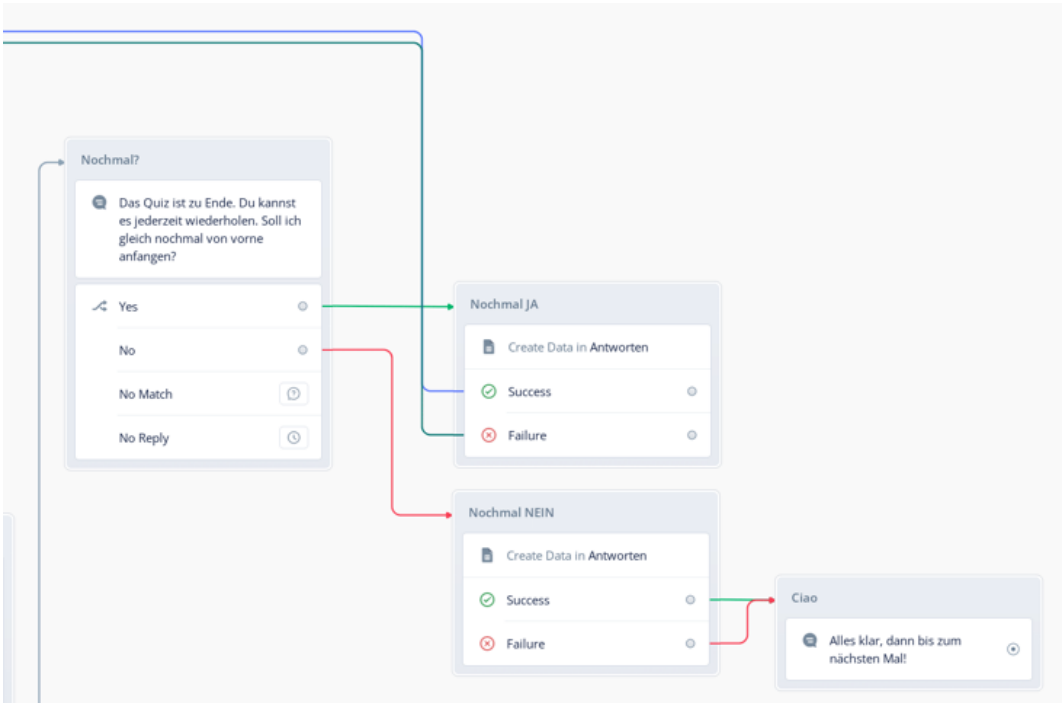

Part 8/10



Part 9/10




Part 10/10



# F. Quiz Instructions

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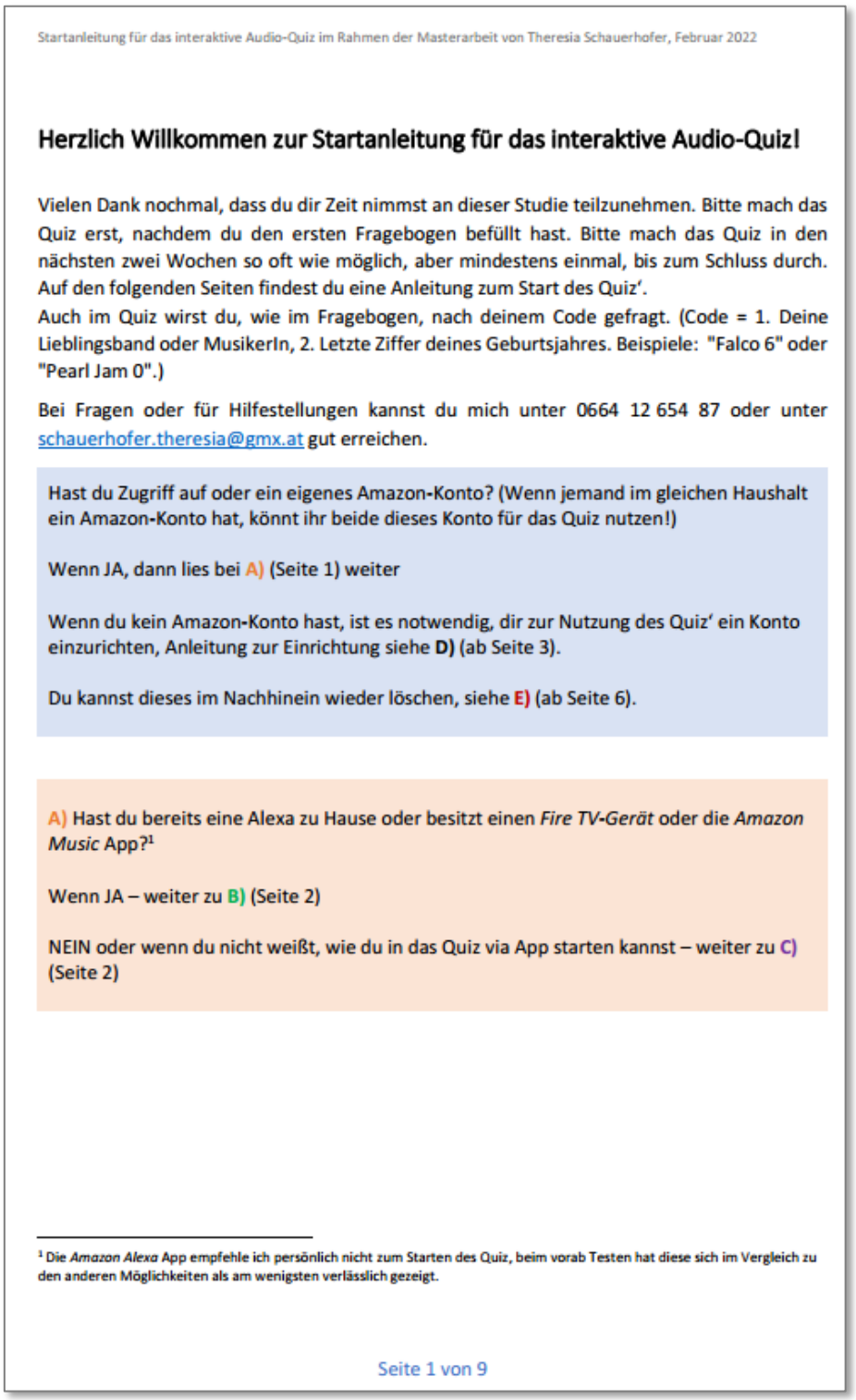

Startanleitung für das interaktive Audio-Quiz im Rahmen der Masterarbeit von Theresia Schauerhofer, Februar 2022

## Herzlich Willkommen zur Startanleitung für das interaktive Audio-Quiz!

Vielen Dank nochmal, dass du dir Zeit nimmst an dieser Studie teilzunehmen. Bitte mach das Quiz erst, nachdem du den ersten Fragebogen befüllt hast. Bitte mach das Quiz in den nächsten zwei Wochen so oft wie möglich, aber mindestens einmal, bis zum Schluss durch. Auf den folgenden Seiten findest du eine Anleitung zum Start des Quiz'.
Auch im Quiz wirst du, wie im Fragebogen, nach deinem Code gefragt. (Code = 1. Deine Lieblingsband oder MusikerIn, 2. Letzte Ziffer deines Geburtsjahres. Beispiele: "Falco 6" oder "Pearl Jam 0".)

Bei Fragen oder für Hilfestellungen kannst du mich unter 0664 12 654 87 oder unter schauerhofer.theresia@gmx.at gut erreichen.

Hast du Zugriff auf oder ein eigenes Amazon-Konto? (Wenn jemand im gleichen Haushalt ein Amazon-Konto hat, könnt ihr beide dieses Konto für das Quiz nutzen!)

Wenn JA, dann lies bei A) (Seite 1) weiter

Wenn du kein Amazon-Konto hast, ist es notwendig, dir zur Nutzung des Quiz' ein Konto einzurichten, Anleitung zur Einrichtung siehe **D)** (ab Seite 3).

Du kannst dieses im Nachhinein wieder löschen, siehe **E)** (ab Seite 6).

A) Hast du bereits eine Alexa zu Hause oder besitzt einen *Fire TV-Gerät* oder die *Amazon Music* App?[1]

Wenn JA – weiter zu B) (Seite 2)

NEIN oder wenn du nicht weißt, wie du in das Quiz via App starten kannst – weiter zu C) (Seite 2)

[1] Die *Amazon Alexa* App empfehle ich persönlich nicht zum Starten des Quiz, beim vorab Testen hat diese sich im Vergleich zu den anderen Möglichkeiten als am wenigsten verlässlich gezeigt.

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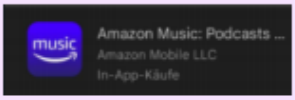
B) Wenn du bereits eine Alexa, die Amazon Music App oder ein Fire-TV Gerät zu Hause hast, dann stell sicher, dass Alexa dir zuhört und starte das Quiz mit den Worten:

„Alexa, starte Sicher gesund"
oder
„Alexa, öffne Sicher gesund"

Bitte mach das Quiz bis zum Ende durch, das Ganze dauert ca. 6 Minuten.

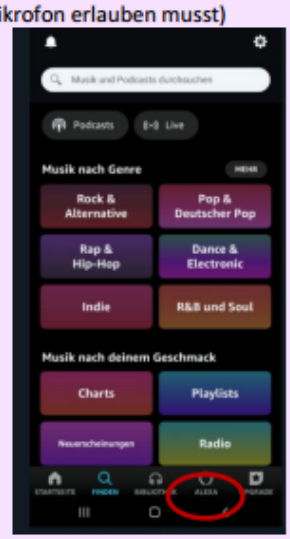
C) Wenn du KEINE Alexa zu Hause hast oder du nicht weißt, wie du mit das Quiz mit den Apps starten kannst, kannst du dir die …

1. *Amazon Music* App am Smartphone herunterladen und auch so mit Alexa sprechen.




1. *Amazon Music* App heruntergeladen?

So sprichst du mit Alexa und startest das Quiz:
Klick auf „Alexa" und sag „Alexa, starte Sicher Gesund" (es kann sein, dass du der App zuerst den Zugriff auf dein Mikrofon erlauben musst)

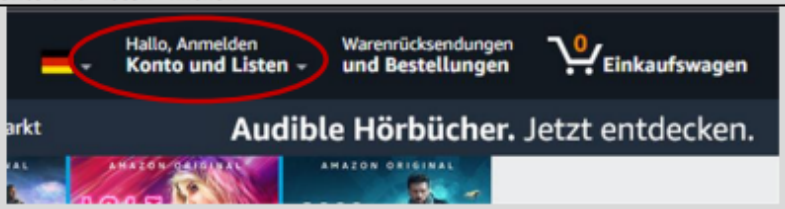



Bitte mach das Quiz bis zum Ende durch, das ganze dauert ca. 6 Minuten.

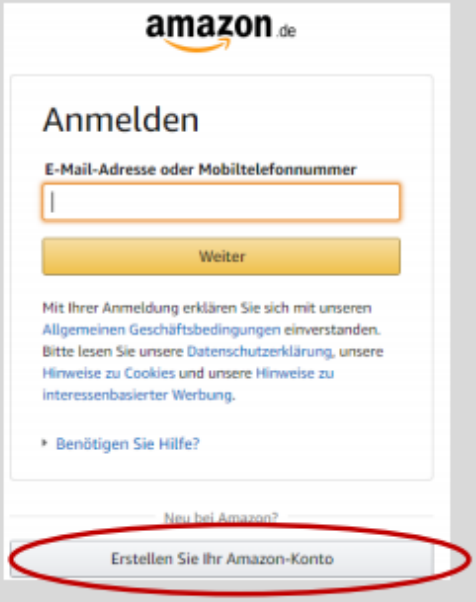
Startanleitung für das interaktive Audio-Quiz im Rahmen der Masterarbeit von Theresia Schauerhofer, Februar 2022

**D)** Hier findest du eine Anleitung zur Erstellung eines Amazon Kontos (Link zur Website → https://www.amazon.de/ , unten nochmals angeführt):

1. Auf der Amazon-Website in der Menüleiste auf die Registerarte „Hallo, Anmelden Konto und Listen" klicken




2. Auf der Anmeldeseite ganz unten auf das grau hinterlegte Feld „Erstellen Sie Ihr Amazon-Konto" klicken.

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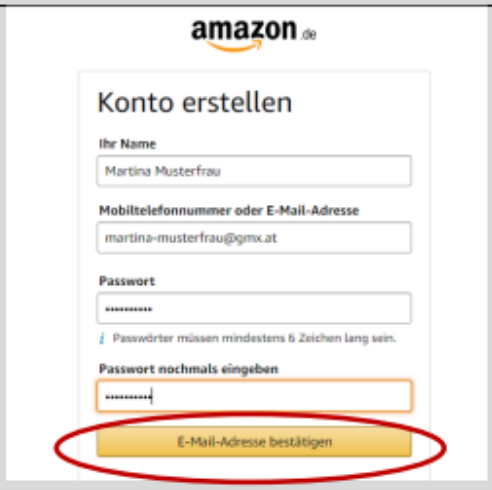
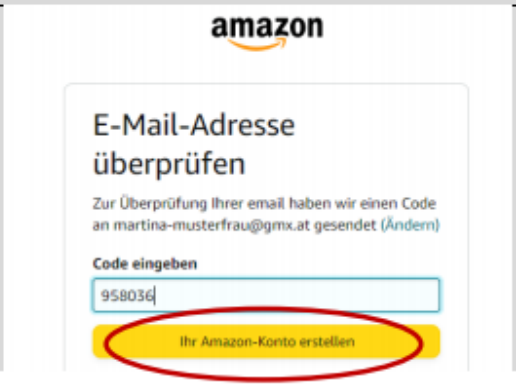
3. Das Anmeldeformular mit den entsprechenden Daten ausfüllen und auf „E-Mail-Adresse bestätigen" klicken.

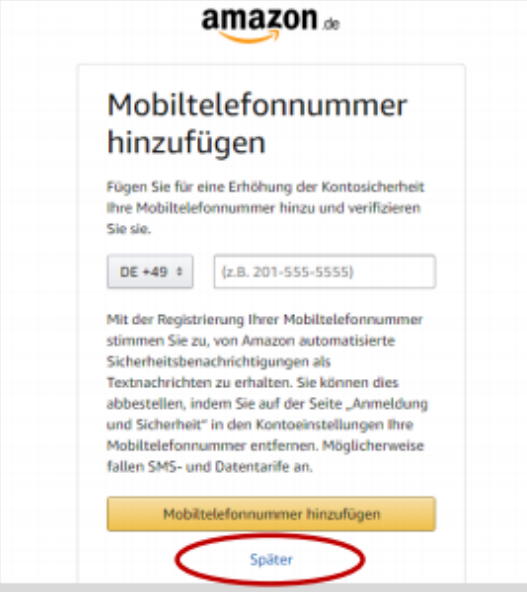



4. E-Mail Postfach checken, Amazon schickt einen Code zur Verifizierung des Kontos


5. Code eingeben und auf „Ihr Amazon-Konto erstellen" klicken



**HINWEIS: Beim Anmelden fragt dich Amazon, ob du eine Telefonnummer zum Konto hinzufügen möchstest. Du musst das NICHT tun! Klick einfach auf „Später".**

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**Fertig? Weiter zu A) (Seite 1)**

**Brauchst du Hilfe? Du kannst mich gern unter 0664 12 654 87 oder unter schauerhofer.theresia@gmx.at kontaktieren oder du fragst jemanden aus deiner Familie, eine/n FreundIn etc. dir behilflich zu sein. Danke für deine Mühe**

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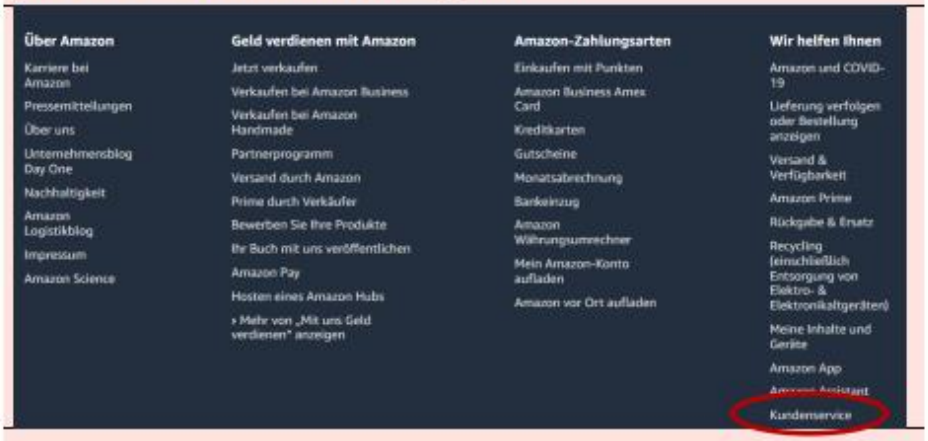
**HIER DER LINK ZUR AMAZON WEBSITE → https://www.amazon.de/**

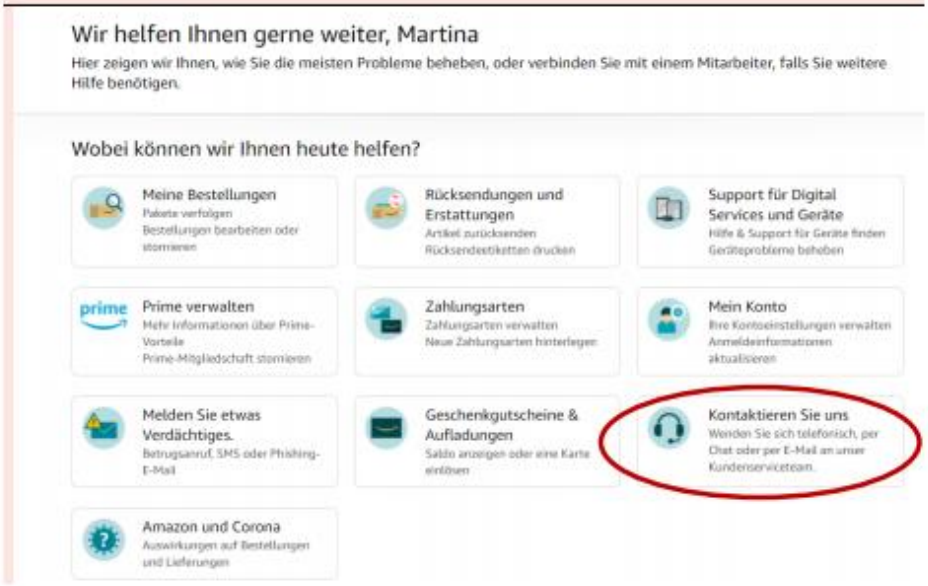
**E)** Du hast bereits den zweiten Fragebogen ausgefüllt und möchtest nun dein Amazon-Konto wieder löschen? Hier findest du eine Anleitung:

HIER DER LINK ZUR AMAZON WEBSITE → https://www.amazon.de/

1. Auf der Amazon-Website ganz nach unten scrollen und unten rechts auf „Kundenservice" klicken. Du musst dazu angemeldet sein!

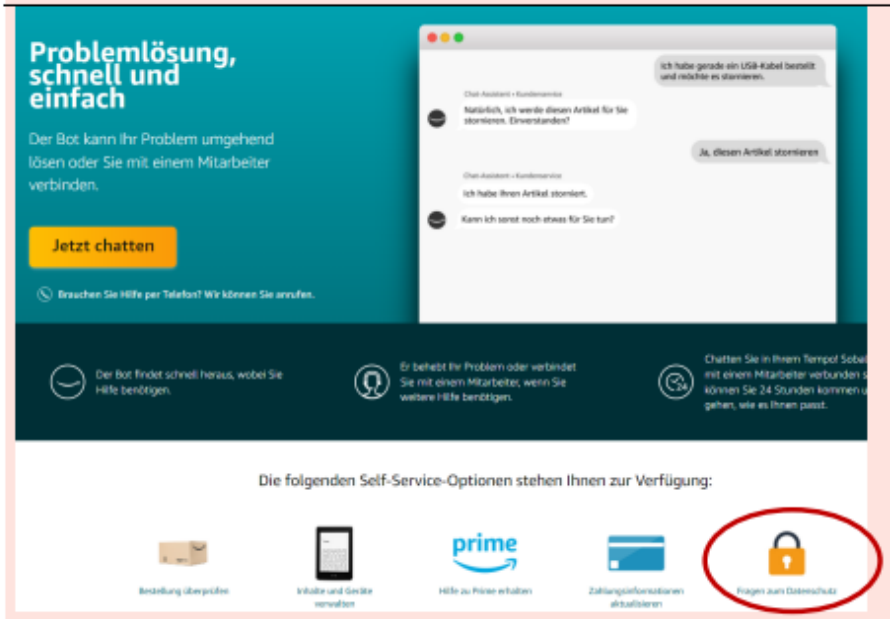



2. Auf „Kontaktieren Sie uns" klicken

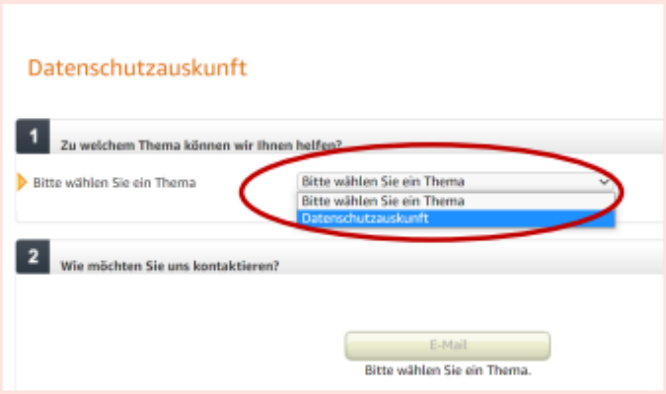


Startanleitung für das interaktive Audio-Quiz im Rahmen der Masterarbeit von Theresia Schauerhofer, Februar 2022

**3. Rechts unten auf „Fragen zum Datenschutz“ klicken**




**4. Das Thema „Datenschutzauskunft“ auswählen**

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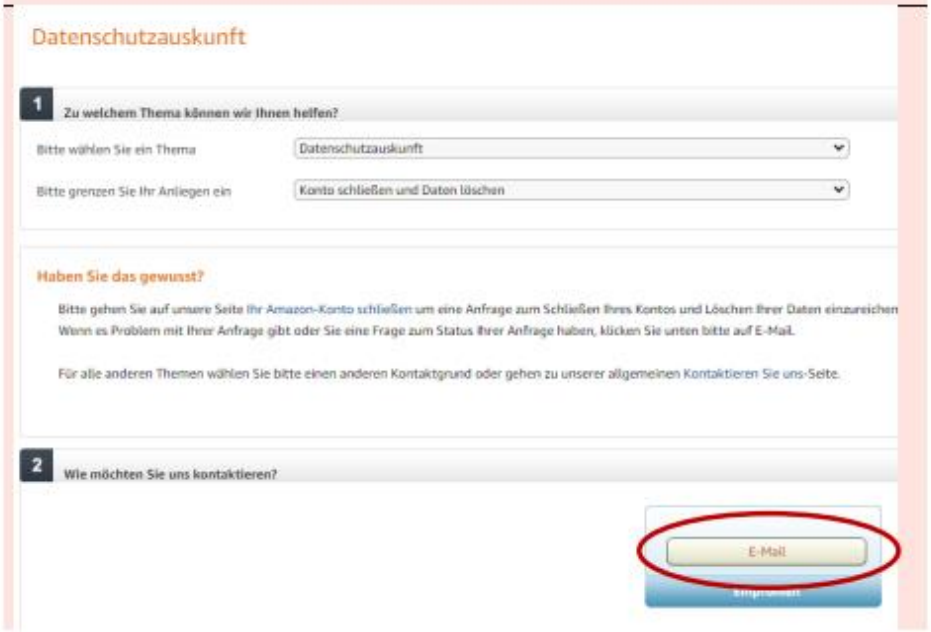
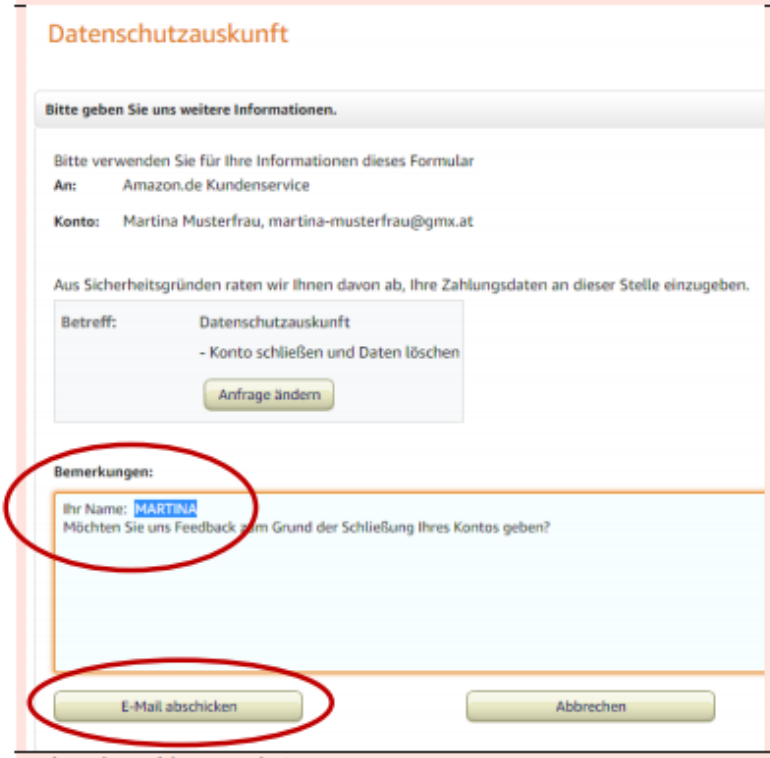
6. Unter „Bitte grenzen Sie Ihr Anliegen ein" „Konto schließen und Daten löschen" auswählen


7. Unter 2 „Wie möchten Sie uns kontaktieren?" auf „E-Mail" klicken



Startanleitung für das interaktive Audio-Quiz im Rahmen der Masterarbeit von Theresia Schauerhofer, Februar 2022

8. Unter „Bemerkungen" nach „Ihr Name:" z.B. deinen Vornamen eingeben (was du genau eingibst ist egal) und dann auf „E-Mail abschicken" klicken




Folgende Meldung erscheint:


Innerhalb von 24h (meistens aber schneller) erhälts du eine E-Mail mit einer Anleitung zur endgültigen Löschung deines Kontos.

Brauchst du Hilfe? Du kannst mich gern unter 0664 12 654 87 oder unter schauerhofer.theresia@gmx.at kontaktieren oder du fragst jemanden aus deiner Familie, oder eine/n FreundIn dir behilflich zu sein. Danke für deine Mühe!

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