Health Insurance Communication about Electronic Patient Records

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Dissertation written under the supervision of Professor Henrique Martins

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"The healthcare system in Germany is decades behind in terms of digitization. We can no longer afford to bear this responsibility."
(Karl Lauterbach, Federal Minister of Health in Germany)

Abstract

Title: Health Insurance Communication about Electronic Patient Record

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This study examines the communication strategies of German Statutory Health Insurances (SHIs) regarding the Electronic Patient Record (EPR) and the potential impact on policyholder behavior. A mixed-methods approach was used, combining ten interviews with SHI representatives and stakeholders with a survey that gathered 100 valid responses from policyholders. Results show a communication on the advantages of the EPR for individual health management but lack a communication on its relevance for the healthcare system.

The analysis shows that current SHI communication strategies are predominantly driven by legal requirements rather than user-centered approaches that incorporate behavioral change mechanisms. Factor analysis and multiple regression tests indicate that motivation and ability significantly influence attitudes towards EPR, while demographic factors play a minor role.

Communication channel preferences indicate a general preference for website communication, while the primary user group of the EPR shows a preference for postal communication. This finding suggests that SHIs should promote digital readiness among policyholders. The analysis highlights the need for a shift in the role of the policyholder towards active engagement as an enabler in solving challenges in the healthcare system. Emphasizing the active use of the EPR in communication is suggested as a means of facilitating this shift.

Limitations include a relatively small sample size and potential bias due to method of survey distribution. Future research should explore deeper behavioral insights through using qualitative methods and examine the role of private health insurances in EPR communication.

Keywords: Electronic Patient Record, Communication, German Healthcare System, Statutory Health Insurance, Behavioral Change, Digital Literacy

Resumo

Título: Comunicação dos seguros de saúde sobre o registo eletrónico do doente

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Este estudo analisa as estratégias de comunicação dos Seguros de Saúde Estatutórios (SHI) na Alemães sobre o Registo Eletrónico do Doente (RPE) e o seu impacto no comportamento dos segurados. Utilizando métodos mistos, foram realizadas dez entrevistas com representantes de SHI e as partes interessadas, e ainda um inquérito com 100 respostas válidas de segurados. Os resultados mostram que a comunicação destaca as vantagens do RPE para a gestão da saúde individual, mas não aborda a sua relevância para o sistema de saúde.

As estratégias de comunicação atuais dos SHI são guiadas por requisitos legais, faltando abordagens centradas no utilizador e mecanismos de mudança de comportamento. A motivação e a capacidade de utilização influenciam significativamente as atitudes em relação ao RPE, enquanto os fatores demográficos têm um papel secundário. A análise realça a necessidade dos segurados se envolverem ativamente na resolução dos desafios do sistema de saúde, colocando ênfase na utilização ativa do RPE como meio de facilitar essa mudança.

Em termos de canais de comunicação, há uma preferência geral pelo uso de websites, mas o principal grupo de utilizadores do RPE prefere comunicação postal, sugerindo que os SHI devem promover a preparação digital dos segurados.

As limitações incluem o reduzido tamanho da amostra e a possibilidade de enviesamento devido ao método de distribuição do inquérito. As futuras pesquisas devem explorar mais profundamente as perspetivas comportamentais usando métodos qualitativos e examinando o papel dos seguros de saúde privados na comunicação do RPE.

Palavras-chave: Registo Eletrónico do Doente, Comunicação, Sistema Saúde Alemão, Seguro de Saúde Estatutário, Mudança comportamental, Literacia Digital

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List of Abbreviations

BI- Behavior Intention

DigiG- Digital Healthcare Act

EE- Effort Expectancy

EHR- Electronic Health Record

EPR- Electronic Patient Record

FC- Facilitating Conditions

GKV- Verbund der Gesetzlichen Krankenkassen

HBM- Health Belief Model

PE- Performance Expectancy

PEU- Perceived ease of use

PU- Perceived Usefulness

SCT- Social Cognitive Theory

SHI- Statutory Health Insurances

SI- Social Influence

TAM – Technology Acceptance Model

TRA- Theory of Reasoned Action

UTAUT- Unified Theory of Acceptance and Use of Technology

1 Introduction

Germany is known for having one of the best healthcare systems in the world (Emanuel, 2020). However, it faces significant challenges, such as increased demand for healthcare services and workforce shortages but especially in driving its digital transformation (Ernst and Ernst, 2020). In fact, Germany ranks 16th out of 17 countries in the Digital Health Index. In contrast, countries such as Estonia and Denmark secured the top positions, demonstrating effective coordination of their digitalization processes (Bertelsmannstiftung, 2023). The German government recognizes a significant deficit in the digital transformation of the healthcare sector (Lauterbach, 2023).

To maintain the quality of healthcare in Germany, the German government has formulated a digitalization strategy for the healthcare sector. This strategy integrates a number of digital laws, in particular the Digital Healthcare Act (DigiG), with a strong focus on digital health (Bundesregierung, 2023). According to the WHO, the term covers the field of knowledge and practice related to the development and use of digital technologies to improve health (Word Health Organization, 2019). At its core, the DigiG focuses on the comprehensive collection of health data through an Electronic Patient Record (EPR) (Digital-Gesetz, 2023). This system, implemented in 2003 in Denmark and in 2003 in Estonia has shown significant benefits. Both countries have gained substantial economic benefits from the EPR, which serves as a "gatekeeper" by keeping patients in outpatient care whenever possible, thus avoiding more costly hospitalization. It has also improved the focus on prevention and home treatment through faster communication, streamlined administrative processes, and effortless access to patient data exactly when and where it is needed (Nohr et al., 2017).

The German government looks to countries like Denmark and Estonia as leading examples and has made efforts to implement the EPR, but widespread adoption has not yet been achieved. (Schmidt-Kaehler et al., 2021).

1.1 Problem Statement

In contrast to Denmark, where the EPR is implemented through a government-controlled portal, Germany has chosen to implement the EPR through a decentralized approach, due to its federal system (KBV, 2024). In Germany, the DigiG mandates that Statutory Health Insurances (SHI) are responsible for providing, managing and communicating the EPR (Elektronische Patientenakte, 2023).

The abstract from the law states:

§342

> *"Starting from January 15, 2025, health insurance companies are obligated to provide each policyholder person, who has not objected within a period of six weeks after prior information according to § 343 regarding the establishment of an electronic patient record to the health insurance company, with an electronic patient record approved by the Society for Telematics according to § 325 paragraph 1." (DigiG)*

There are currently 95 SHIs in Germany, which means that 95 different EPR applications are made available (Liste: Gesetzliche Krankenkasse, n.d.). Consequently, each SHI develops its own communication strategy to inform and promote the EPR to their policyholders, resulting in 95 different communication initiatives.

This approach runs the risk that policyholders are inadequately informed, leading to a lack of understanding of the functionality and benefits of the EPR. Misunderstandings may lead to rejections or resistance to the EPR, thus undermining confidence in the German healthcare system and hindering the desired improvements of the German digitalization strategy (Ueckert et al., 2003).

1.2 Research significance and relevance

Academic research has extensively explored the communication dynamics in the healthcare sector, with a particular focus on healthcare providers and patients (Teutsch, 2003; Rather et al., 2017). However, the cross-functional role of a SHI as a link between the government, the patient, and the healthcare provider is overlooked in the academic literature (Boroch et al., 2017). There has been limited research on the interaction of SHI with its policyholders. Thus, a research gap has been identified, as studies tend to analyse communication from the perspective of patients rather than considering their role as policyholders within a health insurance system.

Furthermore, there is a large body on literature on digital adoption. In particular, frameworks that influence the adoption of digital applications have been studied, such as the Technological Adoption Model (Arni et al., 2017; Hage et al. 2013; Yao et al., 2022). However, to the best of the authors knowledge there are no studies that specifically address SHIs communication strategies to promote EPR adoption. Therefore, this paper aims to integrate communication theory with the role of SHI as a provider of the EPR. It seeks to provide valuable insights into the field of strategic marketing in the context of managing digital health transformation.

1.3 Purpose of this study and research questions

The aim of this study is to provide SHIs with academic research to improve their communication strategy regarding the EPR. This includes identifying the current measures taken by SHIs to communicate about the EPR. In addition, it aims to assess policyholders' perceptions of the EPR and their preferences for communication channels. This study will address the following three research questions:

RQ1: *What communication strategies are statutory health insurances using to effectively inform policyholders about EPR adoption?*

RQ2: *How can the behavioral drivers of the EPR adoption be characterized?*

RQ3: *How can communication channels be used to disseminate information about the EPR according to policyholder preferences?*

2 Background

2.1 German Healthcare System

The German healthcare system serves 83 million citizens at an estimated cost of 498 billion euros in 2022 (Statistisches Bundesamt, 2022). It is primarily financed by statutory and private health insurances. Every citizen in Germany is required to have health insurance, with about 90 percent of the population covered by SHIs. Because of this large percentage, this thesis will focus exclusively on SHIs.

SHIs are public-law corporations responsible for negotiating contracts with healthcare providers, collecting contributions from policyholders and employers, and administering payments for services rendered (Bundesministerium für Gesundheit, 2024). In this study, individuals covered by SHIs are referred to as policyholders (Yang et al. 2023). Policyholders have the right to choose and change their SHI. They are entitled to all medically necessary services required to restore their health.

The legal regulations for the German healthcare system are developed by the Federal Ministry of Health, including the DigiG. However, the system operates on the principle of self-

governance. This means that while the state sets the legal framework and tasks, the organization of healthcare providers and SHI is managed independently (NDR, 2024.)
There are currently 95 SHIs, which can be divided into six types (Aufgaben und Organisation der GKV, 2024)

- 11 General Local Health Insurances
- 70 Company Health Insurances
- 6 Guild Health Insurances
- 6 Substitute Health Insurances
- 1 Social Insurance for Agriculture, Forestry, and Horticulture
- 1 Miners' Insurance

As a result, SHIs are in a unique position, competing despite a legal mandate. In addition to managing this competition, they now bear significant responsibility for the success of their EPR (Digital-Gesetz, 202).

2.2 Electronic Patient Record

A range of terms are used to describe the electronic version of a patient's medical history.
The German Ministry of Health uses the term "elektronische Patietenakte" in the DigiG, which translates to electronic patient record (EPR) (Digital-Gesetz, 2023). However, the term electronic health record (EHR) is also commonly used. Therefore, a clear distinction between the two terms is needed (Brands, 2022; Shull, 2019).

According to the Gabler Wirtschaftslexikon (2018), an EPR is defined as a:

> *"means of **information storage** and **communication**. It captures all patient data (diagnoses, treatment recommendations, incompatible medications, etc.) in electronic form actively managed by the patient."*

The word "communication" is underlined. This is because the EPR is set up by the SHI, with data inputs generated by healthcare providers (doctors, pharmacists, nurses, etc.). Individuals will be able to access, manage, and add to their medical data through a front-end interface (NDR, 2024). Thus, the EPR functions not only as a data storage medium but also as a facilitator of interaction. It requires policyholders to install a front-end setup (application on their mobile device) obtained from their SHI and to authorize themselves before working with it.

Contrarily, according to Gartner (2024) an EHR is defined as:

> *"information storage of patient-centric, electronically maintained information about an individual's health status and care, which is provided, maintained and accessible for clinicians."*

The definition implies that the record is created by the SHI and populated with data by medical staff, possibly without any involvement of the policyholder. As a result, the EHR functions primarily as a data storage system.

Upon closer examination of the DigiG the law aims to introduce the EPR through an Opt-Out method. This means that policyholders must actively object to the use of their data in an EPR (Digital-Gesetz, 2023). Often overlooked is the fact that, in addition to Opt-Out, two other forms of use are possible. The first is in line with the definition of the EPR and will be referred to as actively use. From this point forward, the second form of usage aligns with the definition of the EHR and will be referred to as passively used- not requiring policyholders to download the application to their mobile device.

2.3 Strategic Health Communication

Holtzhausen and Zerfass (2013) defined strategic communication as

> *"the practice of deliberate and purposive communication that a communication agent enacts in public on behalf of a communicative entity to reach set goals, covering the full spectrum of economic and social sector, such as trade and industry, politics, nonprofit and government agencies."*

There are different theories of communication. The constitutive model of communication (Craig, 1999) points to the importance of communication in bringing about actual change and action. From this perspective the role of the practitioner is to send information that can serve as a starting point for the creation of meaning between communicative entity and its stakeholders, which can lead to social change and social action. Therefore, strategic communication focuses on the process of communication that takes place over a long period of time after the initial message has been transmitted. In addition, Couldry and Hepp (2013) highlight the importance of mediatization, which is the concept that encompasses the changes brought about by media in all aspects of people's lives. Thus, the role of media is as important as the constitutive nature of all communication. Rather than viewing media as channels of communication and audiences

as the recipients of messages, strategic communication needs to consider how meaning is formed in the process of interaction between involving stakeholders and the media.

In the field of healthcare, the Department of Health and Human Service (2018) defines health communication as

> "*the study and use of communication strategies to inform and influence individual and community decisions that enhance health*."

The word influence is also included in the definition of the Office of Disease Prevention and Health Promotion (2010) describing strategic health communication as

> "*the art and technique of informing, influencing, and motivating individual, institutional, and public audiences about important health issues."*

Health communication strategies are widely used in commercial and nonprofit contexts to support and motivate behavior change, product adoption, or the advocacy for of a health issue (Schiavo, 2013). The scope has expanded from biomedical interventions at the personal level to contextualized health communication, which includes the social and the environmental circumstances, that affect an individual's health (Freimuth and Quinn, 2004). Consequently, health communication is useful for several purposes. It can raise awareness of health issues to promote changes in policy or practice. It can also secure support for the endorsement of health issues among stakeholders (Haider, 2005).

2.4 Health Insurance Communication

Health insurance communication aims to change people's knowledge, attitudes, and behaviors toward SHI, which includes reinforcing positive behaviors, influencing social norms, and empowering individuals to change or improve their health status (Behrens-Potratz and Zerres, 2010). However, according to Reifegerste (2015), SHI face two challenges that affect their scope for action in communication. First, due to increasing cost pressure in the healthcare sector, there is increased competition among SHI in Germany, which leads to a dilemma between economic interests and legal service obligations. Scherenberg (2011) points out that, as a result, SHIs are increasingly focusing on pricing strategies (such as contribution rates and bonus programs) because they are severely limited in designing their own service portfolios, as most services are defined by law. Second, SHIs face the challenge of acting as advisors and customer-oriented supporters while at the same time ensuring the economical use of resources for solidarity-based financing ("dual mandate"). This conflict affects the relationship of trust

with the policyholder and requires a sensitive handling of the data available from the policyholder (e.g. medication billing) (Reifegerste, 2015). As a result, research identifies mixed styles of communication with policyholders. The following are the three main distinct forms:

1) Communication for acquiring new policyholders

Healthy and young individuals are the most important target demographic for SHI, as noted by Meckel (2010). Consequently, when recruiting new policyholders, the focus of communication activities is on younger demographics. Of note are those individuals who choose a new SHI due to a change in status, such as entering the workforce. However, the interest of this population group is limited due to their good health, which requires considerable efforts on the part of the SHI. For this reason, SHIs offer special information packages for new policyholder. There is also increased investment in online presence, including the creation of online communities. In addition to young adults, young families are becoming an increasingly important target group (Meckel, 2010). They have a higher barrier to switching but are more accessible for awareness raising.

In general, SHIs aim to improve their branding and image to increase the willingness of policyholders to switch providers. This is achieved through a combination of public relations initiatives and advertising campaigns, but the limits of advertising opportunities for SHI are defined by legal regulations (Schweitzer and Bock, 2009). Zok (2009) points out that the primary motivation for individuals to switch is a change in price. Although the current contribution rate in Germany is uniform, SHI differentiate themselves through an additional premium (ranging from 0.9% to 1.5%). In addition, switching is often facilitated by personal contact or recommendations from one's social circle to attract new policyholders (Krafft and Götz, 2011).

2) Communication for retaining customers

Retention is becoming increasingly important for SHI, as membership growth is limited (Krafft and Götz, 2011). To retain their policyholder base, SHIs use member magazines, bonus programs, and focus on service and advice. The reason for this is the limited ability to differentiate on the basis of the range of services offered. In addition, well-engaged policyholders are more likely to accept potential price increases and recommend the SHI to others (Reifegerste et al., 2012).

Most policyholders contact the SHI by telephone, due to the level of individual complexity and legal regulations (Cutler and Zeckenhauser, 2000). The goal of service communication is to

ensure consistent quality of advice across all organizational units and employees (Behrens-Potratz and Zerres, 2010). Targeted measures to achieve this include a comprehensive set of quality tools and training for advisors, as well as mystery callers. In addition, the goal of customer retention is supported by the professional handling of complaints, since a large proportion of customers react with attrition. In addition to traditional consultation, online-based communication is becoming increasingly important (Katz and Moyer, 2004).

3) Communication for healthcare provision and prevention

Communicating policyholders about healthcare and prevention is an effective way to reduce overall healthcare costs. The goal is to transform policyholders with high healthcare costs into policyholders with low healthcare costs (Bödeker and Moebus, 2015). Often, SHIs have extensive data on this target group, which allows for targeted communication. However, Quinn et al. (2010) report that the majority of health prevention communication is found in traditional media, such as print magazines and informational brochures. In addition, there are efforts to motivate policyholders to contribute to their own health processes. Kurtz and Dierks (2006) suggest that SHIs need to become more transparent about disease prevention, and available interventions.

2.5 Communication Channels

Communication channels are defined as the *"pipe"* along which a message is conveyed, with a variety of different communication channels available (Coiera, 2006). According to Hennig-Thuran et al. (2004), there are company-created channels and user-generated channels. Company-managed efforts such as websites, social media, and direct mail are the norm. For the purposes of this study, only company-managed efforts will be considered.

Academic literature categorizes communication channels into two forms: synchronous channels and asynchronous channels. Synchronous channels are used when two parties exchange messages through a channel at the same time. Telephone calls are one of the most common two-way synchronous channels, as used in customer service. Asynchronous channels are used when individuals are separated in time and the channel is used to support their interaction (Watts, 2016). Ball et al. (2004) report that organizations should work with both forms of communication, as it significantly enhances the user experience.

Studies on the role of communication channels show that information diffusion is significantly influenced by the role of different channels (Zmud 1982; Ebadi and Utterback, 1984). For

example, Zmud (1982) showed that information diffuses three times faster through asynchronous channels than through synchronous channels. The researcher also emphasizes that it is the quality of the channels rather than the quantity that determines the effectiveness of communication.

Similarly, Ebadi and Utterback (1984) showed that the diversity of communication channels is positively correlated with the success of technological innovations. In addition to the effect on information diffusion, the selection of channel types should be based on evaluation criteria such as audience reach, engagement level, and credibility and trust (Walsh-Childers et al., 2018). Lamm et al. (2019) found that websites and blogs are the most preferred communication channels across age, gender, education level, and employment status, while calls are the least preferred in terms of audience reach. Derby (2013) argues that social media is the most appropriate channel to ensure audience reach while ensuring high levels of engagement, as it breaks down silos between sections of society and allows communication to occur organically. In contrast, Flanagin and Metzger (2000) have argued that the perception of Internet communication is one of mistrust and is not the appropriate channel type when information should generate credibility and trust.

2.6 Implementing Health Communication

To promote a structured implementation of effective health communication, Donovan (1995) suggests seven steps. An overview is provided in Table 1.

	Topic	Description
1	Situational Analysis	Define and understand the health problem
2	Audience Profiling	Describe factors determining the audience‘s characteristics
3	External Factor Analyses	Early agreement on expected outcomes and evaluation parameters
4	Audience Segmentation	Understand social, political and other external influences
5	Vision and Mission	Agreement on expected outcomes and evaluation parameters
6	Communication Objectives	Strategies designed to meet the objectives
7	Resource Allocation	Adequate funding and human resources

Table 1: Implementing Effective Health Communication in Seven Steps (derived from Donovan, 1995 and Schiavo, 2013)

The first step is to gain a thorough understanding of the health issue, including its medical and situational causes.

In the second step, audience profiling is used as an assessment tool to identify factors that may influence attitudes and behaviors.

In step four, the audience profiles are segmented into groups with similar characteristics. Only health communication based on a true understanding of the audience has a chance of success (Boeijing et al., 2017).

Next, planning teams determine the expected outcomes and evaluation parameters of the communication campaign and share them with key stakeholders.

Step number six consists of designing strategies to achieve the objectives identified in step number five. Based on the audience (step number two) and the resulting segments (step number three), consumer-targeted messages and channels are selected. Fox et al. (2017) conducted research on different types of channels and found that it is beneficial to use a variety of communication channels to achieve a higher effect size. Examples include radio, television, newspapers, flyers, brochures, the Internet, and social media. Finally, step number seven involves calculating an appropriate budget. This is a critical step because, as Waisbord and Larson (2005) noted, although communication efforts have been scientifically proven to be successful, they often do not receive sufficient attention or funding. These activities are often viewed as non-essential and thus vulnerable to budget cuts.

2.7 Behavioral Change Theories

Changing behavior through communication interventions is an enormous intellectual and practical challenge (Bracht, 1998). A central problem in the strategic planning of health behavior change communication is how to identify and apply appropriate behavior change theories to overcome barriers to behavior change (Slater, 1999).

Two distinct approaches have emerged in academic literature to describe the drivers behind the delivery of information to individuals: economic-based approaches and behavioral-based approaches. Economic-based approaches emphasize that economic efficiency and functional optimization are key drivers for achieving behavioral optimization. In contrast, behavioral-based approaches draw on theories from social psychology and sociology to explain the underlying factors that drive individual behavior (Watson et. al, 2015).

Watson et al. (2015) observed that the focus of information delivery has shifted to positive relational constructs, such as trust and commitment. As a result, behavioral-based theories and constructs have become more important than economic-based constructs. In line with the

purpose of health communication-to improve public health outcomes by communicating health-related information to diverse audiences-and the findings of Watson et al. (2015), five different behavioral change theories are examined.

(1) The Health Belief Model (HBM) seeks to explain why people do not participate in health prevention programs. The major contribution of the model is its emphasis on the importance of knowledge as a necessary but not sufficient step for change (Green et al., 2020).

(2) Social Cognitive Theory (SCT) provides insights into the mechanisms and influences that affect individual behavioral adoption. It emphasizes the importance of motivation and self-efficacy as central components in this process. Motivation refers to the internal drive and intention to perform an action, while self-efficacy refers to the individual's belief in his or her ability to perform the action independently or with minimal assistance (Bandura, 2001).

(3) The Theory of Reasoned Action (TRA) determines behavioral performance by the strength of a person's intention to perform a particular behavior. Two main factors contribute to such intentions: a person's attitude toward a behavior and a person's subjective norm. The theory defines a person's attitude as positive or negative emotions or feelings toward a concept or an idea. Subjective norm is defined as the opinion or judgment, positive or negative, of key influencers (Al- Suqri and Al-Kharusi, 2015).

(4) The Multiattribute Utility Model (MAU) assumes that a decision is a function of the ratio of perceived advantages to perceived disadvantages. Consequently, dividing problems into manageable segments can facilitate a decision process. To accomplish this, the decision to perform a task involves identifying a large set of possible outcomes and categorizing them as advantages and disadvantages. In a final step, they are arranged in a hierarchical scheme based on a system that weighs the importance of the outcome (=utility). Empirical studies on the MAU model show that an individual's evaluation of performing or not performing a task depends on the decision of the highest utility (Beach, 1976; Salazar, 1991).

(5) The Technology Acceptance Model (TAM) aims to explain technology acceptance behavior, where behavioral intention (BI) is influenced by two main variables: perceived usefulness (PU) and perceived ease of use (PEU) (Holden and Karsh, 2010). BI is influenced by an individual's motivation or willingness to exert effort to perform the target behavior. PU is defined as an individual's perception that using an IT system will improve performance. PEU describes an individual's perception that using an IT system will be effortless. TAM has been further developed into the Unified Theory of Acceptance and Use of Technology (UTAUT). It expands TAM to include an additional direct variable, the actuality of the technology, and two major predictive factors that influence behavioral intention: social influence (SI) and facilitating conditions (FC), and reformulates PU as performance expectancy (PE) and PU as effort expectancy (EE), SI being the degree to which important others approve or disapprove of the target behavior. FC refers to organizational and technical infrastructures and their perceived supporting role in the individual's use of technology (Davis, 1989). A systematic review conducted by Holden and Karsh et al. (2010) examines the application of TAM and UTAUT in health IT settings and depicts that the relationship between PU and BI of health IT is significant in every test, suggesting that to accept health IT, it must be perceived as useful. An illustration of the model can be depict in Figure 1.

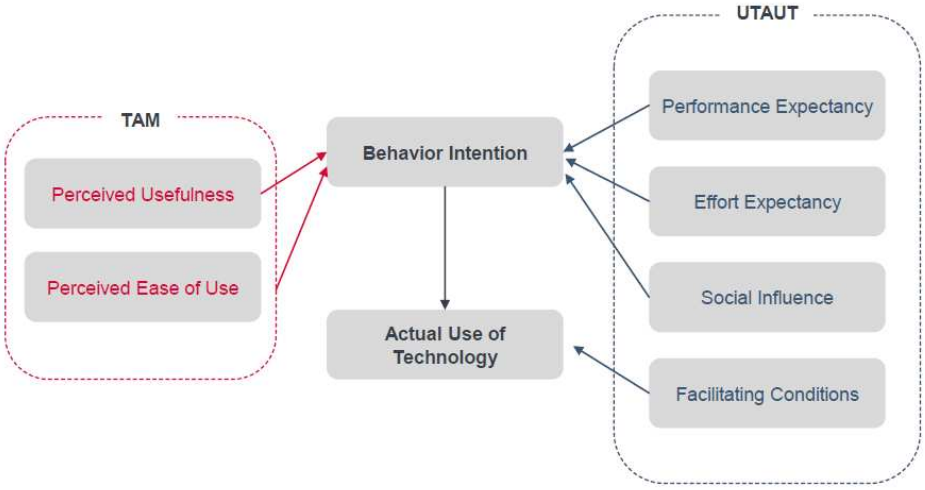

Figure 1: Illustration of the TAM and UTAUT (adapted from Davis et al., 1989 and Venkatesh et al., 2003)

2.8 Hypothesis Testing Overview

RQ	Description
RQ2	H0_1: There is no significant effect of motivation to use EPR, ability to adopt EPR and subjective influence on participants attitude towards EPR. H1_1: There is a significant effect of motivation to use EPR, ability to adopt EPR and subjective influence on participants attitude towards EPR.
	H0_2: There is no significant association between participants attitude towards EPR and age, gender, employment status, and education background. H1_2: There is a significant association between participants attitude towards EPR and age, gender, employment status, and education background.
	H0_3: There is no significant association between EPR Usage Form and age, gender, employment status, and education background. H1_3: There is a significant association between EPR Usage Form and age, gender, employment status, and education background.
RQ3	H0_4a: There is no significant association between participants preference of receiving **postal** communication by their SHI and age, gender, employment status, and education background. H1_4a: There is a significant association between participants preference of receiving **postal** communication by their SHI and age, gender, employment status, and education background.
	H0_4b: There is no significant association between participants preference of **chatbot** communication by their SHI and age, gender, employment status, and education background. H1_4b: There is a significant association between participants preference of **chatbot** communication on the phone by their SHI and age, gender, employment status, and education background.
	H0_4c: There is no significant association between participants preference of receiving communication over **social media** by their SHI and age, gender, employment status, and education background. H1_4c: There is a significant association between participants preference of receiving communication over **social media** by their SHI and age, gender, employment status, and education background.
	H0_4d: There is no significant association between participants preference of receiving communication through **magazines** by their SHI and age, gender, employment status, and education background. H1_4d: There is a significant association between participants preference of receiving communication through **magazines** by their SHI and age, gender, employment status, and education background.
	H0_4e: There is no significant association between participants preference of receiving communication via **e-mail** by their SHI and age, gender, employment status, and education background. H1_4e: There is a significant association between participants preference of receiving communication via **e-mail** by their SHI and age, gender, employment status, and education background.
	H0_4f: There is no significant association between participants preference of receiving communication via SHI **website** and age, gender, employment status, and education background H1_4f: There is a significant association between participants preference of receiving communication via SHI **website** and age, gender, employment status, and education background.
	H0_4g: There is no significant association between participants preference of receiving communication via **phone** and age, gender, employment status, and education background. H1_4g: There is a significant association between participants preference of receiving communication via **phone** and age, gender, employment status, and education background.

Table 2: Overview of Hypothesis Testing for RQ3- own illustration

3 Methodology

3.1 Research Design

A combination of qualitative and quantitative research was chosen. Researchers can benefit from a mixed methodology as it increases credibility and improves decision making by incorporating a variety of data sources (Morse, 2003).

For this study, qualitative data will provide rich insights into SHI communication strategies, while quantitative data will reveal behavioral drivers and preferences for communication channels.

The research was designed in a three-step approach. First, secondary data were obtained from scientific journals and books on the concept of EPR and health communication. This provided an overview of the relevant frameworks explored in academic research. Second, a total of ten in-depth semi-structured interviews were conducted. Both approaches aimed to determine the status quo of current practices in health communication. In addition, the interviews had an exploratory approach to guide the variables for RQ3. To explore behavioral drivers influencing EPR adoption and preferences for communication channels, a third step was to gather policyholders' perspectives through a quantitative survey. The quantitative study used a single cross-sectional design, collecting data from a specific sample at a specific time.

3.2 Data collection and Data sampling

3.2.1 Semi-structured in-depth interviews

Semi-structured in-depth interviews were chosen to gather different expert opinions on the status quo, goals, positioning, relevance, and challenges related to the communication strategies used for the EPR. They also provided information on the communication channels that may be used by SHIs for EPR communication. This made it possible to answer RQ1 and identify variables for RQ3.

Given the complexity of the topic, the degree of information sensitivity, and the time availability of the interviewees, individual interviews were considered the most appropriate technique. An interview guide tailored to the research questions was developed, consisting of 13 questions, slightly adapted for policy makers and healthcare providers. The complete interview guide can be found in the appendix.

The primary target population of the interviews was defined as the German SHIs, as they are responsible for communicating the EPR. However, there is dependency on other stakeholders such as healthcare providers and politicians. Therefore, they were included in the data sampling. The sampling technique used to select appropriate respondents was non-probability, judgmental sampling. This method is commonly used to evaluate business strategies. Non-probability sampling was chosen because of the difficulty of obtaining interviews with all 95 SHIs in Germany. A total of 54 SHIs were contacted via Linked-In, cold calling and email, of which six agreed to be interviewed. In addition, a 10-minute presentation on the scope of the research was given to business professionals in Wilhelmshaven, Germany, on March 13, 2024, with a call for experts with policy and healthcare backgrounds, which resulted in four additional interviews. Table three provides a complete overview of the respondents:

Participant	Organisation	Position	Gender
A	Company Health Insurance	Customer/Market Department Manager	**male**
B	Miners Insurance	Product Manager	**female**
C	General Local Health Insurance	Manager Supply and Performance	**male**
D	Guild Health Inurance	Product Manager	**male**
E	Company Health Insurance	Projectmanagement	**female**
F	Guild Health Insurance	Communication Manager	**female**
G	Software Provider EPR	Consultant	**male**
H	Umbrella Association for Company SHI	Specialist Digitalisation / eHealth	**male**
I	Healthcare Service Provider	Managing Director Rehabilitation Center	**male**
J	Politician	Delegate	**male**

Table 3: Overview of interview participants and attributed letter codes- own illustration

The average interview lasted 40 minutes. All interviews were recorded and transcribed to allow for analysis and coding of responses. Transcription was done using Trint software.

3.2.2 Online Survey

To answer RQ2 and RQ3, an online survey was used to assess participants' perceptions about EPRs, preferences on channel communication and personal characteristics.

The choice of an online survey was made to access a large and geographically dispersed population (Lefever et al. 2007). In addition, an online survey is easy to administer and is time and cost efficient. A potential disadvantage is ensuring that the respondent is representative of the sample (Rice et al. 2017). To address this concern, the questionnaire includes two screening questions about whether the respondent has public or private health insurance and whether they

already use an EPR. If a respondent indicated private health insurance and the presence of an EPR, they were excluded from the sample.

The survey consisted of a structured questionnaire with fixed response alternatives created using Qualtrics software. A total of 10 closed-ended multiple-choice questions on a five-point Likert scale (1=strongly disagree; 5=strongly agree) were used to facilitate data processing and avoid response bias. The survey consisted of three thematic sections. The first section focused on assessing participants' attitudes toward the EPR. The second section collected respondents' preferences for communication channels. The third section collected data on respondent characteristics and demographics.

Direct questions, simple wording, and unambiguous phrases were used in accordance with the suggestions of Malhotra et al.'s (1998) research. To avoid response bias, the funnel approach was used, with characteristic questions and demographics placed last. Pilot testing was conducted on a sample of five people to ensure ease of response and comprehension of the questions (Van Teijlingen and Hundley, 2002).

The survey was distributed by handing out flyers with a QR code on the street in Wilhelmshaven, Germany. In addition, a flyer with a QR code was distributed to various doctors in Wilhelmshaven, Germany. Finally, the survey was shared on social media to reach respondents. In total, 120 respondents were collected. However, only 107 completed the survey and seven respondents had to be excluded. Of these, three did not have statutory health insurance and four already had an EPR. Overall, the completion rate was 83.33%.

3.3 Data Analysis

The interview transcripts were subjected to manual thematic analysis. This facilitated data organization and pattern recognition. The analysis process of the qualitative data followed six steps (see Table 4), which were adopted from the recommended methodology suggested by Braun and Clark (2006).

Participant	Phase	Description
1	Familiarizing with data	› Transcribe data, reading and re-reading data, nothing down initial ideas
2	Generate initial codes	› Coding interesting features of the data in a systematic fashion
3	Searching for themes	› Collating codes into potential themes › Gather all data relevant to each potential theme
4	Reviewing themes	› Checking the themes work in relation to the coded extract › Genertng a thematic „map“ of the analysis
5	Defining and naming themes	› Ongoing analysis to refine the specifics of each theme › Overall story the analysis tells › Generating clear definitions and names for each theme
6	Producing the report	› Selection of compelling extract examples › Relating back of the analysis to the research question and literature

Table 4: Manual Thematic Analysis (adopted from Braun and Clark, 2006)

Survey data was collected using Qualtrics and then analyzed using SPSS statistical software. The data set was cleaned by checking for missing data and outliers. Incomplete responses were removed from the dataset. Descriptive analysis was then conducted to gain a comprehensive understanding of the sample (5.1 Descriptive Analyses). Factor Analysis, ANOVA, Regression and Crosstabs were then used as statistical methods to test the ten different hypotheses. A 5% significance level was used. An overview of the statistical tests related to the hypotheses can be found in the appendix.

3.4 Ethical Considerations

For both methodological approaches, qualitative and quantitative, participants gave their consent to participate in the research. All respondents were informed that the data would be used only for the purposes of the study and that their participation would be anonymous. No personal information was collected that could identify the respondent. In addition, all respondents agreed that the interview could be recorded.

3.5 Validity and Reliability

Measures have been taken to increase the validity and reliability of the study. The present study uses data triangulation, combining semi-structured interviews and a quantitative survey, which increases validity. To maintain high reliability, the transcript of the interviews was sent to each respondent to ensure that their perspectives were accurately represented. In addition, the internal consistency testing (alpha and beta coefficients) was used to test the factor analysis. External validity was enhanced by selecting a convenience sample for the collection of quantitative data. Pilot testing of interview guides and questionnaires further strengthened content validity and increased reliability.

4 Qualitative Results

4.1 Addressing RQ1

4.1.1 Benefits of the EPR

The primary observation from the interviews was a general endorsement of the introduction of the EPR through the DigiG legislation. All participants emphasized that the EPR, once widely implemented, will bring significant benefits to an individual's healthcare. The EPR has the potential to overcome existing data silos between different medical facilities and provide timely information (Participant G, Participant I). This allows healthcare providers to spend more time with patients rather than on administrative tasks. EPR is seen as a lifelong source of information that optimizes holistic patient care by avoiding duplicate examinations (Participant C), while increasing the accuracy and speed of diagnosis (Participant F).

Participant J also highlighted the value from a research perspective, improving the lack of research on rare diseases in Germany by making health data more accessible. Participant C noted that the EPR is a useful tool for health prevention, with additional benefits such as information on potential vaccinations and other preventive examinations. In contrast, Participant G sees the EPR as purely prospective, responsible only for data collection, and therefore not suitable for health prevention.

However, the EPR has the potential to gain importance in the area of patient empowerment, where policyholders are empowered in their health literacy by gaining insight into their own medical records and having the opportunity for personal involvement (Participant G).

4.1.2 Active and Passive Usage

The interviewees identified different roles for policyholders regarding the EPR. Participants H, J, K portray policyholders as beneficiaries of the EPR, but not necessarily as users. Participant G stated that

> *"I* (as the policyholder) *may be the master of my file and you are the mistress of your file, but please let those who care for me work with it."*

Highlighting the benefits of breaking down data silos, policyholders play a passive role in using the EPR (Participant F). On the other hand, Participants A, B, C, and I emphasize that policyholders hold the central key to initiating a much-needed change in the German healthcare system. Therefore, the active involvement of policyholders is required (Participant I).

4.1.3 The Role of Statutory Health Insurances in the Communication

Despite acknowledging the benefits of the EPR for the healthcare system, the interviewees indicated that SHIs are not able to directly benefit from the EPR implementation in terms of process efficiency, access to health data, or cost reduction. (Participant A, CB, F). However, Participant D emphasizes that this is not the main purpose of SHIs. Instead, they are subject to the service promise defined by the government, and they want the best possible for their policyholders. Participant H and I agree with this view. Participant I uses the word *"proactive expert",* describing the role of SHIs. Participant C adds accordingly:

> *"Furthermore, we want to clarify our role as a health insurance company. We see ourselves here as guides or reliable partners for questions."*

Moreover, Participants B, F, H and I discussed the position of SHIs. Participant H describes SHIs as being in a *"tricky market position"*. Participant F notes that SHIs have frequent interactions with policyholders, who are in medical need. However, these interactions are often not positive, as they revolve around financial support for health treatments. In contrast, the SHIs have almost no interaction with those who are considered healthy. Participant H mentions that this needs to change. The opportunity to promote preventive healthcare should be used. Currently, the only effective way to engage with the desired target group is through initiatives such as a bonus program where policyholders receive cash back for participating in preventive health activities. Participant H emphasized that the EPR represents an important opportunity for SHIs to raise awareness among policyholders about the importance of SHIs for their health and well-being.

4.1.4 Communication Goals and Objectives

Long- Term Goals

The interviewees were asked about the long-term goals and short-term objectives of health insurance communication regarding the EPR.

While Participants A, B, C, I, J agreed that the long-term goal is to improve healthcare in Germany. Participant D has a vision of using the EPR as a means of customer acquisition and retention, which would directly benefit their SHI market position:

> *"If we change our mindset, that the EPR is a burden for us, but instead utilize it in the right way, it bears great potential for making us attractive for young, digital policyholders."*

Participant D wants to include additional features in the EPR application in order to differentiate itself from other SHIs.

Short- Term Objectives

Participant F states that the primary objective is to minimize service requests. Consequently, employees are being trained and educated. The success of the policyholder communication is measured by the number of questions policyholder after the communication.

In contrast, other respondents directly link objectives to EPR adoption metrics (Participant A, B, C). For example, Participant B believes that the most important objective is to reduce the number of Opt-Out requests so that many initial records can be created. This approach allows for the creation of *"health data highways"* (Participant A), which are key to breaking down data silos and making the healthcare system more efficient. In addition, it reduces the workload for SHIs, as the handling of appeals requires considerable processing time.

In contrast, Participant C expressed the goal of

> *"actively promoting the use of the EPR and aiming for as many app downloads as possible. The legislator estimates that approximately 20% of policyholder will choose the Opt-out method, leaving 80% who will at least create an EPR. The focus should be on ensuring that as many of these 80% actively use the EPR."*

This suggests that promoting health literacy and empowering policyholders is central to making the healthcare system more efficient. In addition, Participant G notes that the development of the EPR application has been costly and time consuming, and that there should be a return on investment in user adoption.

Participant A envisions a combination of both objectives - in the short term, the number of passive users is critical, while

> *"in the long term, it will not only be about reducing uncertainties but also convincing those who only use the EPR passively. So, the aim is not only to avoid empty and unused records but also to gain active users."*

4.1.5 Current State of Communication with Policyholders

Overall, a sense of uncertainty was expressed. Participants A through F and H cited difficulties in setting up the application identification processes and implementing Opt-Out requests in a

timely manner - not being able to *"do much about communication"*. Participants A, B, E admit that a communication strategy is only rudimentary at this stage, focusing on mandatory legal requirements. In addition, five out of ten interviewees mentioned a *"chicken and egg"* problem (Participants B, D, E, F, J), where the EPR application is the *"chicken"* and the policyholder's health data is the *"egg"*. Without any data input, the EPR remains an empty file with no value. Populating the EPR with health data is the responsibility of healthcare professionals and requires compatible software systems. In the current state, healthcare providers lack the capacity to populate the EPR with data, so SHIs are reluctant to promote the EPR as an empty file. This creates a cycle in which the EPR cannot be accepted and become valuable without initial data input, but data input would not occur without widespread adoption and use.

4.1.6 Strategic Communication Approach

Message Design

Most Participants (A-F) mentioned that the baseline of key messages is determined by the DigiG. Specifically, respondents referred to §343, which states that SHIs are required to provide comprehensive and appropriate information about the EPR in a precise, transparent, understandable, and easily accessible form in clear and simple language.

The extract from the law requires:

§343

> *The information must cover all relevant aspects of data processing for the establishment of the electronic patient record, the transmission of data into the electronic patient record, and the processing of data in the electronic patient record by service providers, including the associated data processing operations within the various components of the telematics infrastructure, as well as information on those responsible for data processing in terms of data protection law.*

The interviewees (Participants C, E, G) pointed out that the interpretation of the legal requirements is not carried out individually by each SHI. Instead, this is done centrally by the "Verbund der Gesetzlichen Krankenkassen" (GKV), the umbrella organization of all SHIs in Germany. This information is uniform for all SHIs and guarantees the same basic level of information for all policyholders in Germany. However, Participants E, H and J indicate that this will not be sufficient to promote a high level of awareness of the EPA. Consequently, as soon as resources are freed up, efforts need to be made to create content that provides additional information so that policyholders can make an informed decision about the benefits and functionality of the EPA. In practice, respondents mentioned different approaches, but the

degree of tailoring messages to different policyholder segments remains low. While participant G aims to focus the key messages on the individual features of the application, Participants J, C, I and F express that benefits of the EPA should be used when developing key messages.
Under the slogan *"Your EPA, Your data"*, Participant J plans to communicate the aspect of data sovereignty as a key message - pointing to active EPA usage. In contrast, Participants C and I chose a different key message. The slogan *"Don't worry, we have your EPA"* emphasizes the passive use of the EPR.
In addition, different opinions emerge regarding messages that address privacy concerns. While Participants C and B are in favor of formulating security concerns as key messages, Participant J takes the opposite view. He believes that it is essential to address policyholders' data concerns but considers it counterproductive to make this a key message, as it risks putting the SHI in a position of having to constantly justify itself.

In the long term, Participant D states that, in addition to providing sufficient information, SHIs need to invest in confidence-building measures that will enable policyholders who initially opt out to become EPA users. This can include documenting and publicizing success stories of the EPR (Participant D, E).

Policyholder segmentation

Overall, the interviews revealed a superficial level of policyholder segmentation due to insufficient data analysis. Interviewees agreed in defining the largest user group of the EPR. The current need lies with individuals who generate high traffic in the healthcare system, often chronic, dependent and elderly people (Participants C, D, E, F, J). Participant K summarizes this as the policyholder,

> *"who have the most illnesses, go to the doctor the most, and receive the most services from the solidarity healthcare system. Thus, the more often you go to the doctor in your life, the greater the benefit of the EPR."*

Participant A suggested that the EPR is relevant to everyone, since it is not possible to predict whether they will eventually be part of the group of individuals. Respondent G suggests that there is a need to segment policyholders in order to effectively identify which aspects of the EPR will benefit specific groups of policyholders at different stages of their lives. Conversely, Participant F believes that targeting communications to specific groups could lead to the risk of selection, which is contrary to the legislative intent.

A suggestion for policyholder segmentation was made by Participants D, I, and J, who stated that policyholders should be segmented based on three motivational factors: personal illness, patient empowerment, and intent to contribute to research. Participants B and C shared that they work across the company with "personas" developed through market research that represent stereotypical policyholders. However, due to a lack of data analysis resources, the proposed segments have not been verified for the EPR. Realistically, a more basic approach to policyholder segmentation will be implemented.

Participant H identified two policyholder segments, those who choose to opt out and those who do not. It is important that policyholders who choose to opt-out receive a specific communication that acknowledges their decision while still giving them the opportunity to reconsider.

Participants A and G distinguish between policyholders who are concerned and those who are not, as evidenced by the high volume of calls to customer service. Participant G believes that policyholders concerned about data security should not be addressed early in the communication process because there is no evidence to allay their concerns.

Respondent E differentiates the EPR target groups based on regional factors. A large number of policyholders are located in Gütersloh. Therefore, Participant E plans to design a specific communication for the local population.

Communication Channels

While the GKV is responsible for the preparation of the basic information according to §343, the SHI can decide for themselves how they provide the information to their policyholders (Participant H). This creates great uncertainty for the SHIs (Participant A). Participant C points out that

> *"we won't have much choice but to create a letter that we have to send out to comply with the information obligation. This is, of course, very dry in communication. Here, many policyholders are lost. Therefore, it is important to use more attractive channels in addition."*

Participant F also confirms that they will use the postal route, but will also make the information available online.

Regarding more attractive channels, Participant C mentioned that the SHI's own website is an important source for policyholders because it is easily accessible and provides space for detailed information. In particular, FAQ pages generate the most traffic (Participant F). In addition,

Participants B, C and G agree that e-mail communication is considered an important channel as it offers the possibility to address policyholders directly.
The majority of Participants (C, D, F and J) highlighted social media, especially YouTube, as an important tool. Participant D emphasized that short video clips are easy for policyholders to understand and provide a great user experience without using a lot of resources.

An increasingly important channel is the service app offered by many SHIs (Participants A, H). Participant A noted that their SHI's service app includes a chatbot that allows policyholders to address their specific questions. This alternative to traditional customer service calls aims to reduce the volume of inbound calls. Participant G observes a dual behavior. On the one hand, society is increasingly accustomed to seeking touchpoints with desired companies through digitization, such as downloading smartphone applications. On the other hand, customer service hotlines remain the primary channel for policyholders to address their questions.
Participants A-F confirmed that the most used channel for policyholders to address questions is a phone call. Participant C suggested the idea of including information about EPR in the on-hold messages that are played while policyholders wait during customer service calls.
Although Participant C considers digital channels to be the most important channels because the EPR is a digital product and that is where search traffic occurs, it remains important to use print media for policyholders with low digital affinity. Two types of print advertising were mentioned by the respondents. While Participants C, G and J see flyers as a proven medium, Participant A aims to use internal magazines and regional press. Despite the different communication channels, the interviewees considered it important to bridge analog and digital channels (e.g. by using QR codes).

4.1.7 Communication Implementation

The implementation of the communication strategy differs depending on the type of SHI. Company health insurances are generally smaller and have fewer resources than local or guild health insurances so despite the same regulatory requirements, the extent of implementation varies. Participants A, B and H want to implement EPR communication in a single-phase model, consisting of the legal obligation according to §343 DigiG, distributed over different channels. Participants C, D and F consider this to be insufficient. Participant C plans to implement communication in a two-phase model. A first round of communication will address the legal requirements (§343) by focusing only on postal mail. A second, more comprehensive

communication will focus on the benefits of the EPR and will be published through all channels that are relevant to the availability of the EPR.

Participant F presents a three-stage model. Like Participants A, B, C and H, the legal requirements are implemented. Secondly, employees are trained to be able to answer questions arising from the legally required communication. Finally, once the law is enacted, comprehensive communications are disseminated using multiple key messages and channels and Opt-Out requests are managed.

Participant D presents a five-phase model with a focus on internal communication. The first phase, which has already been completed, consisted of a status quo analysis. In a second phase, employees are educated and trained to advocate for the EPR internally. The third phase is the preparation and execution of the §343 requirement. In the fourth phase, all questions and Opt-Out requests will be addressed and feedback from policyholders will be generated. Subsequently, Participant D intends to suspend communication until the law is enacted on January 25 and the six-week period during which policyholders still have time to opt out is over. During this period, policyholder feedback will be analyzed and different policyholder segments will be identified. In the final phase, these segments will be used to tailor communications and provide education on features that are relevant and beneficial to each segment.

5 Quantitative Results

5.1 Descriptive Analysis

Demographics

A total of 107 survey responses were collected. After applying inclusion and exclusion criteria, 100 responses were included. The gender distribution was unbalanced with 68% female. Most respondents were between the ages of 25-36 (36%) and 50-64 (28%). Full-time employees made up 41% of the sample, while 21% were retired. Only 13% were students, 7% were self-employed, and 2% were unemployed. In terms of academic background, 38% of respondents reported having a Master’s degree, 21% a Bachelor's degree, 19% an apprenticeship, and 16% a high school diploma.

EPR usage behavior

Attitudes towards the introduction of the EPR in Germany through an Opt-Out procedure showed a mean score of 4.16 (SD = 0.972). Interest in the EPR was slightly lower, with a mean score of 3.84 (SD = 1.032). Respondents were also asked about their intended use of the EPR. The majority indicated that they could imagine actively using the EPR by installing the application on their smartphones. In addition, 36% of respondents intended to use the EPR passively, and 4% indicated that they would opt out.

Survey participants were also asked to self-assess their ability to use digital health tools such as the EPR. The mean score for participants who felt competent in using an application on their smartphone was 4.24 (SD = 0.955). When asked if they felt confident using a health application like the EPR with support, the mean score was slightly higher at 4.37 (SD = 0.837).

Participants highlighted their main motivations for using the EPR. The highest rated motivation was to use the EPR to facilitate faster exchange of personal health information between healthcare providers, with a mean score of 4.38 (SD = 0.749). This was followed by the desire for greater transparency of one's own health data, with a mean score of 4.19 (SD = 0.849). Other motivations included using the EPR to reduce medication errors (mean = 3.89, SD = 1.014), to receive better medical care (mean = 3.66, SD = 1.075), and as a tool for patient empowerment (mean = 3.60, SD = 0.964).

Descriptive analysis, which assessed the subjective influence on survey participants, revealed that the opinions of healthcare professionals had the greatest influence (mean = 3.65, SD = 0.957). This was followed by the influence of family and friends (mean = 2.60, SD = 0.995). The opinion of the SHI seemed to have the least influence on the respondents (mean = 2.85, SD = 1.038).

Communication Channels

Survey participants were asked to rank communication channels that were mentioned by interview participants in order of preference. The results showed that website communication was the most preferred communication method (mean = 4.02, SD = 0.852). This was followed by the use of chatbots (mean = 3.31, SD = 1.220). Mail and email communication had similar mean scores (3.04, SD = 1.294 and 3.04, SD = 1.238, respectively). The least preferred communication methods were magazines (mean = 2.62, SD = 1.144), social media (mean =

2.39, SD = 1.118), and phone calls (mean = 1.96, SD = 1.063). See appendix for an overview of the descriptive analysis.

5.2 Hypothesis Testing for RQ 2

RQ2: *How can the behavioral drivers of the EPR adoption be characterized?*

Hypothesis 1

Factor analysis was used to examine the relationships between the independent variable, attitude toward EPR, and three variables derived from behavioral theory: motivation to use EPR, ability to adopt EPR and subjective influence.

Four items were used to measure attitude toward EPR. However, the statement *"I have concerns and reservations regarding the implementation and use of EPR"* had to be reversed for clarity of interpretation. All items had communalities greater than 0.5. The Kaiser-Meyer-Olkin (KMO) test yielded a value of 0.777, indicating sufficient sampling adequacy, and Bartlett's test of sphericity was significant, confirming the appropriateness of conducting factor analysis on the four items. One factor was extracted, meeting the criterion of eigenvalue greater than one and explaining 74.174% of the total variance. The reliability analysis showed satisfactory consistency with a Cronbach's alpha of 0.872.

Similarly, the same approach was applied to the three items assessing the ability to use EPR. All items exhibited communalities greater than 0.5. The KMO test yielded a value of 0.684, indicating adequate sampling, and Bartlett's test of sphericity was significant, supporting the suitability of factor analysis with the three items. One factor was extracted with an eigenvalue greater than one, explaining 83.003% of the total variance. The reliability analysis showed satisfactory consistency with a Cronbach's alpha of 0.898.

Similarly, the same methodology was applied to the five items assessing motivation to adopt EPR. All items showed communalities greater than 0.5. The KMO test yielded a value of 0.850, indicating adequate sampling, and Bartlett's test of sphericity was significant, supporting the appropriateness of factor analysis with the five items. One factor was extracted with an eigenvalue greater than one, explaining 68.573% of the total variance. Reliability analysis showed satisfactory consistency with a Cronbach's alpha of 0.879.

The same approach was used for the three items assessing subjective impact. Although one item showed a communality level slightly below the 0.5 benchmark (0.482), it was retained for analysis. Bartlett's test of sphericity was significant, supporting the appropriateness of factor analysis with the three items. One factor was extracted with an eigenvalue greater than one,

explaining 59.983% of the total variance. Reliability analysis showed satisfactory consistency with a Cronbach's alpha of 0.665.

As a next step, multiple linear regression was performed to test the statistical relationship. The person correlation showed a sliding tendency towards multicollinearity with the highest value being 0.798. All other assumptions for running linear regression are met. The Normal P plot is distributed around the line of normality, the residual scatter plot does not follow a pattern, and the VIP is less than 10.

The model summary shows an R-square of 0.660, which means that 66% of the variance is explained by the model. The ANOVA is significant with a value of 0.0001, meaning that the model is significant overall. Looking at the table of coefficients, the variables motivation to adopt (p-value 0.001) and ability to adopt (0.033) are significant. Subjective influence has a p-value of 0.123. Therefore, we reject H0 for the variables motivation to adopt and ability to use. The unstandardized beta of 0.157 for ability and 0.684 for motivation implies a positive relationship between the dependent variables and the independent variable.

Hypothesis 2

An N-WAY ANOVA was conducted to examine the demographic factors influencing attitudes toward EPR. The assumption of equal variance was met, as evidenced by Levene's test of equality of error variance, which yielded a significance value of 0.121. However, the between-subjects test did not show significance below the 5% cutoff, so H0 cannot be rejected. The descriptive analysis revealed that individuals up to the age of 49 years tend to have a more positive attitude towards EPR compared to those 50 years and older. Furthermore, males have a more positive attitude towards EPR than females. In terms of employment status, students have the highest positive attitudes towards EPR, while in terms of educational background, participants with a Master's degree have the highest positive attitudes towards EPR.

Hypothesis 3

To explore the factors influencing the choice of EPR usage form, demographic variables including age, gender, employment status, and educational attainment were examined using a chi-squared test with crosstabs. The test focuses only on the active and passive forms of use, as there is insufficient data to conduct a statistical analysis on the Opt-Out choices.

The results of the independent chi-square test showed p-values of 0.527 for age, 0.150 for gender, 0.337 for employment status, and 0.896 for education. None of these variables reached significance below the 5% cutoff, so the null hypothesis was not rejected.

However, when examining the descriptive analysis, 72% of men expressed a willingness to actively use EPR, compared to 54% of women who voted for active use overall. Voters for active use were predominantly in the 39-49 age group, while voters for passive use were predominantly in the 65+ age group. In the 18-24 age group, 45% of respondents voted for passive use.
In terms of employment status, all self-employed respondents indicated a preference for active EPR use, followed by 59% of full-time employees. Passive use was more common among retirees (48%), with 10% opting out.

Finally, educational background revealed that the majority of those with a bachelor's degree (71%) preferred active use, while passive use was more common among those with an apprenticeship (42%). An overview of the statistical test performed for RQ2 can be found in the appendix.

5.3 Hypothesis Testing for RQ 3

RQ3: *How can communication channels be used to disseminate information about the EPR according to policyholder preferences?*

To test hypotheses 4a-g, FOUR-WAY ANOVAs were conducted on each of the communication channels that respondents mentioned to spread information about the EPR.

Hypothesis 4a: Postal Communication
The demographic variables of age, gender, education, and employment status served as the dependent variables. The Levene's test for equality of error variance yielded a value of 0.514 and cannot be rejected, allowing the analysis of the ANOVA table to proceed. The variables age (p-value 0.046) and education (p-value 0.038) are significant at the 5% level.
The Tukey post hoc test showed that the age groups 18-24 years to 50-64 years, 25-35 years to 50-64 years and 25-35 years to 65+ years show a significant difference. Based on the descriptive analysis, it is evident that people 65 years and above have the greater preference for postal

communication. The Tukey post hoc on educational background showed a significant difference between participants with a Master's degree and those with an apprenticeship, with those with an apprenticeship preferring postal communication. Further descriptive analysis shows that women prefer postal communication more than men, and the highest preference for postal communication is among participants who retired from the workforce.

Hypothesis 4b: Chatbot

The homogeneity test was not rejected (p-value 0.230) and the interpretation of the ANOVA can continue. The variables age (p-value 0.004) and education (p-value 0.003) were found to be significant at the 5% level. Based on the Tukey post hoc test for age, the statistical difference is between the age groups 36-49 and 50-64 and the age group 36-49 and 65+. The mean score for the younger age group (mean= 3.72) is higher than for the older age group (mean= 2.86 and 2.78, respectively). The Tukey post hoc for educational background indicated a significant difference between participants with a master's degree and those with an apprenticeship. Descriptive statistics indicated that those with an apprenticeship preferred chatbot communication over those with a universal degree. In addition, descriptive statistics indicate that men (mean= 3.41) prefer chatbot communication over women (mean= 3.26), and the preference for chatbot communication was highest for the unemployed (mean= 4.50) in the employment status category.

Hypothesis 4c: Social Media

An ANOVA on social media communication showed that the assumption of equal variances was met (Levene's test: p = 0.856). The analysis revealed a significant effect of age on social media communication preferences (p-value 0.038). Tukey post-hoc tests indicated that the significant difference was between the age groups of 24-35 years and 50-60 years.

Descriptive statistics show that the 24-35 age group prefers social media communication the most, with a mean score of 3.00. The 18-24 age group follows with a mean score of 2.55. Older age groups show a decrease in preference, with the 50-64 age group having a mean score of 2.00 and those 65 and older having a mean score of 2.11. In addition, women (mean= 2.47) prefer social media communication more than men (mean= 2.22). The variable educational background shows that participants with an apprenticeship (mean= 2.63) and people considered as students (mean= 2.77) show the highest preference for social media communication.

Hypothesis 4d: Magazines

The results of the ANOVA on magazine communication preferences using the demographic variables indicate that the assumption of equal variance is met (Levene's test: $p = 0.856$). However, no significant differences were found as all p-values exceed the 5% threshold. Descriptive analysis shows that the 50-64 age group has the highest preference for magazine communication (mean= 2.82). Women have a slightly higher preference (mean= 2.72) than men (mean= 2.41). Those who work full time have the highest preference (mean= 2.72) among employment statuses. In addition, individuals with an apprenticeship background have the highest preference for magazine communication (mean= 2.84) compared to those with a graduate degree.

Hypothesis 4e: E-Mail

When testing the preference for e-mail communication, the results of the ANOVA test also confirm that the assumption of equal variance is met (Levene's test: $p = 0.100$). However, no significant differences were observed, as all p-values exceed the 5% threshold. Descriptive analysis shows consistent preferences across age groups and gender, ranging from mean scores of 2.71 (36-49 years) to 3.17 (65 years and older) and from 3.09 (men) to 3.01 (women). The self-employed have the lowest preference for email communication (mean= 2.43), while full-time employees have the highest preference (mean= 3.20). Finally, email communication is particularly preferred by those with a high school education (mean= 3.19).

Hypothesis 4f: Website Communication

The results of the ANOVA for website communication preferences using the demographic variables indicate that the assumption of equal variance is met (Levene's test: $p = 0.340$). However, no significant differences were found as all p-values exceed the 5% threshold. The descriptive analysis shows that people aged 18-24 (mean= 4.36) have the highest preference for website communication. The lowest preference was reported by the 65+ age group (mean= 3.78). In addition, men (mean= 4.22) indicated a higher preference for website communication than women (mean= 3.93). Among demographic groups, the unemployed showed the highest preference for website communication with a mean score of 4.50. In addition, participants with an undergraduate degree had the highest preference for website communication, with a mean score of 4.00.

Hypothesis 4g: Phone communication

The FOUR-WAY ANOVA on telephone communication shows a significant effect of employment status (p-value = 0.028), while the assumption of equal variance holds (Levene's test: p-value= 0.113). The Tukey post-hoc tests show that the significant effect is between the groups of full-time and part-time employees. A descriptive statistic shows that part-time employees (mean= 2.69) prefer telephone communication compared to full-time employees (mean= 1.68). All other demographic variables were above the 5% cut-off and therefore not significant, but the mean differences indicate that men (mean= 2.13) prefer phone communication over women (mean= 1.88). In addition, participants between the ages of 36-49 (mean= 2.14) and 50-64 (mean= 2.14) prefer phone communication more than other age groups. Finally, the descriptive variable for educational background indicates that participants with an education (mean= 2.32) prefer phone communication the most. An overview of the results can be found in the table below, a detailed overview of the statistical results can be found in the appendix.

		Postal	Chatbot	Social Media	Magazine	E-Mail	Website	Phone
	Overall mean	**3.04**	**3.31**	**2.39**	**2.62**	**3.04**	**4.02**	**1.96**
Age	18-24						↑	
	25-35			x*				
	36-49		x*				No mean differences	x
	50-64				x			x
	65+	x*				x		
Gender	Women	x		x	x	x	↓	
	Men		x					x
Education	High School					x		
	Apprentiship	x*		x	x	x		x
	Undergraduate		x*				x	
	Graduate							
Employment	Full-Time Employee				x	x		
	Part-Time Employee							x
	Self-Employed							
	Retired	x						
	Student			x			x	
	Unemployed		x					

* *Significant variables*

Table 5: Findings Hypothesis 4a-g- own illustration

6 Discussion and Implications

The present study provides an understanding of the complexity of the German healthcare system by examining the communication strategies for EPR developed by SHI. Based on the challenges of the healthcare system, it is important to examine the position of the SHI, the role of the policyholder, factors that promote behavioral change, and the value of user-centered approaches. This discussion highlights five key findings and their contribution to academic research.

The benefits of EPR for policyholders were clearly identified and agreed upon by interviewees, but its relevance for the healthcare system is not. Consequently, the SHI communication strategy focuses on explaining the EPR and its associated benefits but fails to highlight its importance in addressing the challenges within the healthcare system. This is reflected in the SHI approach of basing their communication strategies on the minimum legal requirements (§343 DigiG), which evolve around the functionality of the EPR and related data protection regulations. Research by Mann (2005) highlights the existing "data silos" as the main factor hindering the evolution of healthcare systems. However, according to Offedal et al. (2019), patients perceive the lack of financial and human resources as the main challenges in the healthcare system. Therefore, the present study highlights not only the importance of communication, but also the need to convey the broader societal and future generational importance of EPR, which in turn leads to improved individual care.

The analysis of the interviews revealed a shift in the role of the policyholder within the German healthcare system. The interviews show efforts and considerations to promote health literacy and patient-centeredness among policyholders through the EPR, which means that policyholders are assigned a new, central role in the healthcare system. This trend can also be observed in academic literature. For example, Nuss et al. (2021) found that emerging digital technologies such as fitness trackers lead to a significant increase in motivation for physical activity. In addition, a study of 2,000 adults divided into different generations found that GenZ (born between 1997 and 2012) are the most concerned about their health, which prevents them from experiencing everything they want to experience in life. Like Millennials (born between 1981 and 1996), Gen Z is more likely than the Boomer generations (born between 1955-1970) to prioritize healthy eating and mental health. Reasons for this trend include greater access to health information (American Psychiatric Association,2023).

Recognizing that policyholder empowerment is key to the much-needed changes in the German healthcare system, communication efforts should motivate policyholders to actively use the EPR. This will start the process of behavioral change. Passive use of the EPR will keep policyholders in their current role.

Current communication strategies are primarily driven by legal obligations rather than adopting a user-centered approach that incorporates behavioral change mechanisms recommended by the literature. Rather than focusing on the policyholder who will use the EPR, communication is predominantly focused on the EPR itself. In addition, there is a uniform approach to communication delivery, with every policyholder receiving the same communication. However, the literature suggests that promoting behavioral change requires a policyholder-centric approach. HBM, SCT, and the TRA emphasize the importance of understanding individual motivational drivers, their ability to use the EPR, and their respective subjective influences. Based on these insights, relevant subgroups can be identified and communication can be tailored to them (De Boer et al., 2013). The quantitative aspect of this study supports the idea that motivation and ability to use the EPR influence a person's attitude towards it, suggesting that high motivation and confidence in their ability would promote active EPR use. Furthermore, the descriptive analysis suggests that demographic factors indicate different usage preferences.

The interviews highlighted the lack of specific guidance to SHIs on which communication channels to use to disseminate information about §343 to policyholder. A wide range of communication channels were suggested as potential means of outreach. Academic literature emphasizes that the effectiveness of communication is more influenced by the quality than the quantity of channels. In addition, research by Schultz and Schultz (1998) suggests that communication efforts should be aligned with customer preferences to ensure a quality customer experience. The quantitative results of this study support the notion that policyholders differ in their preferences for communication channels and provide initial guidance on how to approach user-centered communication.

Consistent with Lamm's (2019) research, website communication emerged as the most preferred channel among interview participants. However, when analyzing the preferences of different user groups, postal communication was preferred by women over the age of 65.

This is noteworthy given that the main user group of the EPR is older people with medical needs. Research by Bertakis et al. (2000) indicates that women in this age group report lower self-reported health status and higher frequency of visits to primary care clinics and diagnostic services compared to men. Consequently, the present study shows that the largest user groups of the EPR prefer non-digital communication for a digital tool. This highlights the importance of managing the digital readiness of key user groups.

SHIs have a unique position in the German healthcare system, acting as an intermediary between the policyholder and the state. The present research suggests that currently SHIs do not use EPR communication to pursue their own economic goals, such as attracting or retaining policyholders. Although, to the best of the authors' knowledge, there is no existing literature that specifically addresses the role of the EPR in attracting and retaining policyholders, but parallels can be drawn with the evaluation of bonus programs. Research by Friedel and Nürnberg (2010) examined the importance of bonus programs for SHI. They showed that bonus programs have gained importance in recent years as a value-added and differentiating feature in the competitive landscape of SHI. In addition, these programs serve as a justification for the different price premiums that policyholders must pay depending on the SHI of their choice. Friedel and Nürnberg (2010) conclude that many SHIs consider bonus programs to be indispensable, since not offering them would be a competitive disadvantage. By designing individual measures, they target specific subgroups and thus use bonus programs as a tool to retain and win back policyholders. As one interviewee pointed out, a similar approach is possible for the EPR application by including additional features or developing a high-quality user experience.

7 Limitations and Future Research

Despite the efforts made to reach SHIs, health professionals and politicians through various channels, a total of ten interviews were conducted, six of which involved SHIs. However, the study reached all main types of SHIs, except for Substitute Health Insurances. The difficulty in finding interviewees can be attributed to the current heavy workload of the staff responsible for managing the EPR, which leaves them with insufficient time and capacity to participate in an interview.

In addition, the sample size for the quantitative research is 100 valid responses, which is a relatively small sample size. Some of the results were not suitable for statistical interpretation of the German population, as the survey was also distributed through social media channels to increase response rates. A larger sample size would have improved the quality of this research. Given the four-month timeframe, the limited number of interviewees can be attributed to the time constraints faced.

While an informative text on the broad concept of EPR and its uses was presented in accessible language, there is no standardized definition distinguishing between EPR and EHR, especially in German, where both are included under the term "ePa". This may have led to some biased responses, as participants' own prior knowledge was not assessed in the present study.

Due to the quantitative design of the study, participants were not completely free to express their reasons for choosing a particular form of EPR use. However, this aspect can be explored in future research now that a baseline has been established. Qualitative methods, such as in-depth interviews or focus groups, could provide richer insights into these areas and allow for a deeper use of behavior change theory in relation to the EPR.

In addition, the findings regarding the potential for SHIs to use EPR communication as a means of customer acquisition should be explored in future research. While SHI is the primary focus of the current study, private health insurers in Germany operate under different regulatory requirements and market dynamics. Therefore, evaluating their approach to EPR communication may differ significantly from that of SHIs, with implications that could be adapted by SHIs to use EPR communication for customer acquisition and retention.

8 Conclusions

The SHIs communication strategy on EPRs informs policyholders about the functionality and benefits for individual health management. Efforts to communicate the broader implications of EPRs for the healthcare system, such as closing existing data silos, are lacking.
In addition, current SHI communication strategies appear to be driven primarily by regulatory requirements rather than user-centered approaches that incorporate behavior change

mechanisms. In addition, the results of the study show that SHIs are not considering EPR communication for economic purposes, such as customer acquisition and retention.

A key observation emerged regarding the evolving role of the policyholder in the healthcare system. By moving from a passive to a more central and active role, policyholders can initiate transformative change within the healthcare system. Key to this transformation is the active use of the EPR as a tool to promote policyholder engagement. The findings suggest that communication efforts should be directed at encouraging policyholders to actively use the EPR.

In addition, this study provides an indicator which communication channels SHIs can use to communicate relevant information about the EPR, as this was identified as a key uncertainty in the interviews. The preferred channel among participants is website communication, but the main user group of the EPR prefers postal communication, which means that the digital readiness of policyholders needs to be examined.

The results of the study contribute to a deeper understanding of SHI communication dynamics and their impact on policyholder behavior. The study suggests that the current uniform approach to communication can be improved through tailored communication based on the behavior change mechanism and the intended forms of use.
In addition, the study provides valuable insights for SHIs to refine their communication strategies and facilitate the successful implementation of the EPR. Using behavior change models, this research not only sheds light on SHI communication practices, but also provides a basis for further exploration of the overall importance of SHI, not only in light of the German government's digital strategy, but also beyond.

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10 Appendix

10.1 Overview Results Hypothesis testing RQ 2

Hypothesis	Statistical Test	Result
H0_1: There is no significant effect of motivation to use EPR and ability to adopt EPR on participants attitude towards EPR. H1_1: There is a significant effect of motivation to use EPR and ability to adopt EPR on participants attitude towards EPR.	CROSS-TABS	**Fail to Reject**
H0_2: There is no significant association between participants attitude towards EPR and age, gender, employment status, and education background. H1_2: There is a significant association between participants attitude towards EPR and age, gender, employment status, and education background.	MULTIPLE LINEAR REGRESSION	**Reject for Ability to use and Motivation to adopt**
H0_3: There is no significant association between EPR Usage Form and age, gender, employment status, and education background. H1_3: There is a significant association between EPR Usage Form and age, gender, employment status, and education background.	FOUR- WAY ANOVA	**Fail to reject**

10.2 Overview Results Hypothesis testing RQ3

Hypothesis	Statistical Test	Result
H0_4a: There is no significant association between participants preference of receiving **postal communication** by their SHI and age, gender, employment status, and education background. H1_4a: There is a significant association between participants preference of receiving **postal communication** by their SHI and age, gender, employment status, and education background.	FOUR- WAY ANOVA	**Reject for Age and Educational Background**
H0_4b: There is no significant association between participants preference of **chatbot** communication by their SHI and age, gender, employment status, and education background. H1_4b: There is a significant association between participants preference of **chatbot** communication by their HIP and age, gender, employment status, and education background.	FOUR- WAY ANOVA	**Reject for Age And Educational Background**
H0_4c: There is no significant association between participants preference of receiving communication over **Social Media** by their SHI and age, gender, employment status, and education background. H1_4c: There is a significant association between participants preference of receiving communication over **Social Media** by their SHI and age, gender, employment status, and education background.	FOUR- WAY ANOVA	**Reject for Age**
H0_4d: There is no significant association between participants preference of receiving communication through **Magazines** by their SHI and age, gender, employment status, and education background. H1_4d: There is a significant association between participants preference of receiving communication through **Magazines** by their SHI and age, gender, employment status, and education background.	FOUR- WAY ANOVA	**Fail to Reject**
H0_4e: There is no significant association between participants preference of receiving communication via **e-mail** by their SHI and age, gender, employment status, and education background. H1_4e: There is a significant association between participants preference of receiving communication via **e-mail** by their SHI and age, gender, employment status, and education background.	FOUR- WAY ANOVA	**Fail to Reject**
H0_4f: There is no significant association between participants preference of receiving communication via SHI **website** and age, gender, employment status, and education background. H1_4f: There is a significant association between participants preference of receiving communication via SHI **website** and age, gender, employment status, and education background.	FOUR- WAY ANOVA	**Fail to Reject**
H0_4g: There is no significant association between participants preference of receiving communication via **phone** and age, gender, employment status, and education background. H1_4g: There is a significant association between participants preference of receiving communication via **phone** and age, gender, employment status, and education background.	FOUR- WAY ANOVA	**Reject for Employment Status**

10.3 Interview Manuel

1. Can you please briefly introduce yourself and outline your experience in the field of healthcare communication?
2. What added value does the EPR bring to policyholder persons, health insurers and the healthcare system in general?
   - *Adaptation for healthcare providers: What added value does the EPR bring to patients, healthcare facilities and the healthcare system in general?*
3. What role do health insurers play in educating and building trust among the policyholder with regard to the EPR?
   - *Adaptation for Healthcare Providers: And how does the role of health insurers differ from that of healthcare providers, particularly in relation to EPR communication?*
   - *Adaptation for politicians: What role do politicians play in informing citizens about the EPR and what role do health insurers play?*
4. What is the current form of communication on EPR?
5. What challenges do you see in communicating the EPR with policyholders?
6. What are the main topics of communication on the EPR?
7. What does the planning process for communicating the EPR look like? What are the relevant phases that need to be developed?
   - *Adaptation for healthcare providers: (This question is not applicable)*
   - *Adaptation for Politicians: (This question is omitted)*

8. What should be the aim of communication on the EPR?
9. In your opinion, which communication channels are most effective for informing policyholders about the EPR?

10. How do you ensure that communication about the EPR is tailored to the target group?
    - *Adaptation for Healthcare Providers: How relevant do you see a target group-oriented approach in the communication of the EPR?*
    - *Adaptation for Politicians: How relevant do you see a target group-oriented approach in the communication of the EPR?*

11. What different forms of use of the EPR exist and how are these taken up in communication?

12. How can health insurance companies strengthen the trust of the policyholder with regard to the use of the EPR?

13. What strategies and measures can health insurers take to motivate policyholders to actively use the EPR?
    - *Adaptation for healthcare providers: What strategies and measures can healthcare facilities take to motivate patients to actively use the EPR?*

10.4 Sample Transcript Participant A

Speaker 1: The recording is now running. To start, I would like to ask you to briefly introduce yourself.

Speaker 2: Gladly. My name is XXX and I work at XXX. We are a federal statutory health insurance company, which means we insure legally insured individuals from all over Germany. I am the head of the Marketing and Services department, which includes four disciplines: new graphic design, marketing, internal and external communication, and services, which are divided into analog services and digital services. Analog services include statutory benefits and selected contracts—essentially anything where we can offer an analog added value. It should be emphasized that we are currently in the middle of the development process. The topics we manage are not entirely new, but the team composition is. So, the team is just now coming together.

Speaker 1: How would you evaluate the current working status of the team?

Speaker 2: The team is just now finding its footing, and there's a bit more clarity coming in. Currently, there are many uncertainties associated with the topic of electronic patient records. We need to first determine where we currently stand, especially with a view toward 2025, when there will still be many legal uncertainties.

Speaker 1: What significance would you attribute to the electronic patient record in the whole area of digitalizing the German healthcare system?

Speaker 2: This needs to be considered from various perspectives, and for us as a health insurance company, the mandate is first and foremost of a legal nature. From the patient's point of view, the benefit is very high. There are certainly people who will generate significant benefits from the ePA, but numerous barriers need to be overcome first. On the other hand, they may encounter huge barriers if they want to actively move towards reform today. To make it clear, I do believe that the ePA has very, very high significance. This is also reflected in the efforts of the legislator to introduce the ePA and gain users.

Speaker 1: What barriers are you referring to here?

Speaker 2: Two things. One is something quite rudimentary, which I call the digital affinity of the insured. And the second one, which might not be on everyone's radar, is the area of identification. Anyone who wants to use telematics infrastructure applications, including the ePA, must identify themselves. This process is very complex. So, we make it difficult for people who could greatly benefit from the applications. These are the individuals who need significant medical care, those who are in need of care, and they are subjected to extremely high security measures.

Speaker 1: Can you elaborate on this?

Speaker 2: Currently, there are two ways to identify oneself with us. One can either appear in person at the office in Koblenz. This means that someone in Berlin would have a problem. Or the insured can use the Postident procedure. This means they can go to a post office or authorize themselves online if they have a digital ID card.

Speaker 1: What is needed from your perspective for the insured to actively use the ePA?

Speaker 2: I think we first need to identify a need among the insured. I don't yet see where the need for the ePA is among young people. Young people don't need a medium for self-administration, but they have the digital affinity required to use the ePA as intended by the federal government. The current need is among those who generate high traffic in the healthcare system. These are the chronically ill, those in need of care, elderly people, and those with multiple chronic conditions. But these are also the individuals who currently lack digital affinity. However, it should be noted that the legislator, in §20 SGW 5, calls on statutory health insurance companies to increase the digital competence of their insured.

Speaker 1: From a marketing perspective, what uncertainties are you specifically trying to address in your communication strategy?

Speaker 2: I think the image that exists among the public is fundamentally incorrect. The insured always think that as soon as the ePA is created, it is filled with the corresponding health data, but that's not true. When we, as a health insurance company, create an ePA, it is nothing more than a medium. The medium must first be filled with health data by the service providers. It is also widely believed that we, as a health insurance company, can access the data stored in the ePA. This is also not true. So, currently, there are many uncertainties among consumers about what the ePA is all about. Now, as we approach 2025, we, as health insurance companies, don't even know what the ePA will be capable of. The current draft of the Digital Law is naturally somewhat abstract. So, we don't know what the legislator specifically expects from us, the health insurance companies, based on these abstract formulations. We know there will be an obligation to provide information, which means that we, as a health insurance company, must answer specific questions for the insured. How exactly we have to do this is not known. Is it sufficient to publish the information on our website, or do we have to make it accessible in a way that each insured person is individually informed? Which insured people do we need to inform? The 80-year-old Gudrun, yes. But do we also need to inform the newborn insured person who cannot yet read or write? Additionally, it has not been specified what the Opt-Out process should look like for the insured.

Speaker 1: You are referring to the Opt-Out method, correct?

Speaker 2: Yes, exactly. It also needs to be clarified how we are to offer the Opt-Out method to our insured. Will the Opt-Out method be such that opting out means the ePA is completely off the table, or does the insured need to object to individual data sets they do not want to be included in the ePA? There are also questions regarding IT implementation.

Speaker 1: Can you elaborate a bit more on the information obligation you mentioned earlier?

Speaker 2: According to the draft legislation, all statutory health insurance companies are subject to an information obligation. This clarifies exactly which information we, as a health insurance company, must provide and through which medium. However, each health insurance company cannot interpret this individually but must wait for the development of an information sheet from the BKK Federal Association. This will answer the questions for the general public, and we, as a health insurance company, then need to process this information. We expect to have a final version by May. Once we have this document, we can consider how

we, as the marketing and communication department, will address the topic. Here, we need to think about how to reduce uncertainties, highlight the benefits, and thus generate users.

Speaker 1: Now, this involves a significant amount of effort. Where does the added value for health insurance companies come from?

Speaker 2: Fundamentally, we, as a health insurance company, are very eager to offer our insured this product. However, current figures show that less than 1% of our insured actively use the ePA. Therefore, we, as an insurance company, cannot see that the insured have a great desire for the ePA. On the other hand, we have invested a lot of time and money in developing the app and are now also being tasked with fulfilling the information obligation, which ties up additional resources. So, currently, I cannot see that we are getting a significant added value from the ePA for our insured.

Speaker 1: What tools in communication with the insured will be relevant in the future?

Speaker 2: The first measure that needs to be taken is to train the employees in customer service. The second measure is an information campaign. We are currently restructuring our website under the motto "Your Data, Your Decision." There, we describe the current status of the ePA in a low-threshold manner. This is how we want to reduce uncertainties, with the goal of avoiding objections even today. Objections are problematic from two perspectives. On the one hand, the insured do not benefit from the ePA, and on the other hand, it creates work for us if an objection needs to be individually processed. We want to avoid both. We could inform our customers through flyers and provide them with a QR code that leads directly to our website. This way, we connect the analog and digital worlds. Additionally, we could provide information through our service app and create a special section for it. Furthermore, we could integrate our AI-based chatbot on the website, which understands customer inquiries and provides corresponding information. These ideas are part of our current and potentially future measures to provide information to our customers.

Speaker 1: Now, the means you mentioned do not fall under active customer outreach. Do you not see this as necessary?

Speaker 2: The only way to actively reach out to our insured and inform them about the topic would be through flyers, to contact them in writing. We had the idea to potentially make phone calls and inform them about the benefits of the ePA, but that is currently not feasible. There are certain legal and practical challenges that make it difficult to contact insured individuals by phone for promotional purposes. We are currently working on another project called Opt-in, where we first need to obtain the insured's consent to be contacted for promotional purposes. It is important that we want to do some form of advertising. Here, we are walking a fine line. When does it become an information obligation, and where does it become pure advertising?

Speaker 1: What other messages do you think could create incentives?

Speaker 2: An essential point is the reclaiming of sovereignty, at least as it currently stands in the EU. Health data is becoming increasingly important, especially when someone moves from one place to another. In the past, there were often problems when the old family doctor refused to pass the patient file to the new family doctor. But now the patient file belongs to the insured themselves, and they can manage it on a medium that belongs to them.

Speaker 1: And how would you address this in a target group-specific manner?

Speaker 2: The greatest interest in the ePA currently comes from those who don't want it. Why? Because they have enormous uncertainties about their data being mishandled. This means that we currently need to reach those who have the most fears. Essentially, this means there is likely a large portion of the population that has no issues downloading the ePA, using it, and occasionally contacting customer service for updates to personal data. These users are relatively straightforward. However, there is a challenge with a segment of the population that may have trust issues or need more information to accept the ePA. So, it is important to build this trust and convince this group of people that the ePA is safe and beneficial. Starting in 2025, it will not only be about reducing uncertainties but also about convincing those who only use the ePA passively. The goal is to avoid empty and unused records and instead gain active users. It is a constant back-and-forth between these different challenges.

Speaker 1: To what extent do you think monetary incentives are useful in this context?

Speaker 2: I think it could be a significant incentive to increase user numbers. However, there are also risks, especially in terms of data protection. Additionally, we must consider that we operate within a solidarity system. It is challenging to imagine how this could be implemented currently.

Should we reward individuals who are particularly healthy or those who are particularly engaged? Or should we prefer those who intensively use the ePA because they are particularly ill? So, where exactly do we start: with the degree of usage or the degree of health? These are important questions that we need to consider.

Speaker 1: Thank you for your time. I will stop the recording now.

10.5 Survey Script

Introduction Text

Dear Participants,

Thank you very much for your valuable participation in this scientific survey!

This survey is an essential part of my master's thesis at the Católica Lisbon School of Business & Economics and deals with the usage behavior of electronic patient records.

What can you expect?
The study is divided into three parts. In the first part, you will be asked questions about the electronic patient record. The second part examines personal preferences on communication channels. In the final part, I will ask you to provide some demographic information about yourself.

What is important to know?
1) There are no right or wrong answers. Your personal assessment is crucial.
2) Please read the questions carefully. It takes about 10 minutes to complete the survey.
3) All collected data will be anonymized and used exclusively for the evaluation of the master's thesis.

If you have any questions, comments, or remarks, I am at your disposal. You can reach me at the email address s-ffritzsching@ucp.pt.

Once again, thank you very much for your participation!

Best regards,
Fabienne Fritzsching

Master's student in Strategic Management in the Healthcare Sector with a focus on Digitalization and Innovation

Screening Questions

To ensure that you are the right participant for this study, please answer the following introductory questions.

To what extent do the following statements apply to you personally:

SC1: What time of health insurance do you have? (Private / Public)
SC2: I am already a user of the Electronic Patient Record (Agree / Disagree)

Information Text 1

The Electronic Patient Record (ePA)
What is the electronic patient record?

The electronic patient record (ePA) is your personal, digital folder for health data. Here, you can store documents related to your health, such as older medical and hospital reports in digital form, and allow doctors to add new medical documents.

How do you manage the electronic patient record?
You receive your personal ePA through your insurance. To do this, download the relevant app from your health insurance provider from the App Store. A list of the different apps can be found at the following link: [https://www.gematik.de/anwendungen/e-patientenakte/epa-app] then need to register for use and confirm using two-factor authentication.

Usage behavior

Q1: Based on the information text, please assess your proficiency in using digital devices (smartphone, tablet, etc.).

To what extent do the following statements apply to you personally:
AB_1: I feel confident in handling electronic devices such as computers, tablets, or smartphones (Totally Disagree/ Disagree/ Neutral/ Agree/ Fully Agree)
AB_2: I feel competent in updating or modifying information online (Totally Disagree/ Disagree/ Neutral/ Agree/ Fully Agree)
AB_3: I am confident that with support or training, I am able to use an electronic health record. (Totally Disagree/ Disagree/ Neutral/ Agree/ Fully Agree)

Q2: What would be your motivation for using an electronic patient record?
My main motivation to use an EPR is:
MO_1: More transparency regarding my findings, treatments and therapies (Totally Disagree/ Disagree/ Neutral/ Agree/ Fully Agree)
MO_2: Better medical care (Totally Disagree/ Disagree/ Neutral/ Agree/ Fully Agree)
MO_3: Faster data exchange regarding my heath data (Totally Disagree/ Disagree/ Neutral/ Agree/ Fully Agree)
MO_4: Patient empowerment to manage my health data (Totally Disagree/ Disagree/ Neutral/ Agree/ Fully Agree)
MO_5: Reduce medication errors (Totally Disagree/ Disagree/ Neutral/ Agree/ Fully Agree)

Q3: What is your general opinion on the use of electronic patient records?
AT_1: I think the introduction of EPR is a meaningful idea (Totally Disagree/ Disagree/ Neutral/ Agree/ Fully Agree)
AT_2: I like that the EPR is being introduced (Totally Disagree/ Disagree/ Neutral/ Agree/ Fully Agree)
AT_3: I am interested in the use of the EPR (Totally Disagree/ Disagree/ Neutral/ Agree/ Fully Agree)
AT_4: I have concerns and reservations about the introduction and use of an EPR (Totally Disagree/ Disagree/ Neutral/ Agree/ Fully Agree) **Q4: Which opinion on the ePa do you consider important for your usage behavior?**

SI_1: The opinion of my healthcare professionals regarding the EPR usage is important to me (Totally Disagree/ Disagree/ Neutral/ Agree/ Fully Agree)
SI_2: The opinion of my family and friends regarding the EPR usage is important to me (Totally Disagree/ Disagree/ Neutral/ Agree/ Fully Agree)
SI_3: The opinion of my statutory health insurance regarding the EPR usage is important to me (Totally Disagree/ Disagree/ Neutral/ Agree/ Fully Agree)

Information Text 2

There will be a total of 3 forms of use for the electronic patient file from January 2025.
1) Active use: Your health insurance fund creates an electronic patient file for you. This digital file system is filled with data by healthcare providers (doctors, pharmacies, etc.). You decide to actively manage the file by installing the corresponding ePa app on your end device (manage access, ...). You can also enter health data yourself (pain diary, etc.)
2) Passive use: Your health insurance company creates an electronic patient file for you. This digital file system is filled with data by the healthcare providers (doctors, pharmacies, ...). This happens without you having to do anything. You do not actively manage anything and do not need to set up an application on your end device.
3) Opt-out: You object to the creation of an electronic patient file by your health insurance company. Your health data will then be managed as before.

Q4: Which form of use do you prefer?
UF_1: I intend to you the EPR actively (this includes downloading the application from the respective health insurance provider)
UF_2: I intend to use the EPR passively
UF_3: I intend to opt-out from the EPR

Communication Channels

Q6: Which channels would you prefer to be informed about the electronic patient record by your statutory health insurance?
CC_1: I would like to receive communication about the EPR by postal mail (Totally Disagree/ Disagree/ Neutral/ Agree/ Fully Agree)
CC_2: I would like to receive communication about the EPR through a chatbot (Totally Disagree/ Disagree/ Neutral/ Agree/ Fully Agree)
CC_3: I would like to receive communication about the EPR through social media (Totally Disagree/ Disagree/ Neutral/ Agree/ Fully Agree)
CC_4: I would like to receive communication about the EPR through magazines (Totally Disagree/ Disagree/ Neutral/ Agree/ Fully Agree)
CC_5: I would like to receive communication about the EPR by E-Mail (Totally Disagree/ Disagree/ Neutral/ Agree/ Fully Agree)
CC_6: I would like to receive communication about the EPR through health insurance website (Totally Disagree/ Disagree/ Neutral/ Agree/ Fully Agree)
CC_7. I would like to receive communication about the EPR by phone (Totally Disagree/ Disagree/ Neutral/ Agree/ Fully Agree)

Demographic Indicators

Q7: Please indicate your age group:

(1) 18-25 years old (2) 25-35 years old (3) 36-49 years old (4) 50-64 years old (5)65 years and older

Q8: What is your gender?

(1) Female; (2) Male; (3) Prefer not to say

Q9: What is your current employment status?

(1) Full- time employee (2) Part-time employee (3) Self-employed (4) Retired (5) Student (6) Unemployed

Q10: What is your highest educational degree?

(1) High School (2) Apprenticeship (3) Undergraduate Degree (4) Graduate Degree (5) Other

10.6 SPSS Results

Overview Descriptive Statistics

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Transparency into personal health data	100	1	5	4.19	.849
Better medical care	100	1	5	3.66	1.075
Faster Exchange of personal health data	100	1	5	4.38	.749
A tool for patient emplowerment	100	1	5	3.60	.964
Reduction of medical Errors	100	1	5	3.89	1.014
Valid N (listwise)	100				

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-24	11	11.0	11.0	11.0
	25-35	36	36.0	36.0	47.0
	36-49	7	7.0	7.0	54.0
	50-64	28	28.0	28.0	82.0
	65 Jahre und älter	18	18.0	18.0	100.0
	Total	100	100.0	100.0	

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Männlich	32	32.0	32.0	32.0
	Weiblich	68	68.0	68.0	100.0
	Total	100	100.0	100.0	

Employment Status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Vollzeitbeschäftigung	41	41.0	41.0	41.0
	Teilzeitbeschäftigung	16	16.0	16.0	57.0
	Selbstständig	7	7.0	7.0	64.0
	Student	13	13.0	13.0	77.0
	Im Ruhestand	21	21.0	21.0	98.0
	Arbeitssuchend	2	2.0	2.0	100.0
	Total	100	100.0	100.0	

Education Status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Abitur /Mittlere Reife	16	16.0	16.0	16.0
	Abgeschlossene Berufsausbildung	19	19.0	19.0	35.0
	Bachelor-Abschluss /Diplom-Abschluss	21	21.0	21.0	56.0
	Master-Abschluss / Magister	38	38.0	38.0	94.0
	Sonstiges	6	6.0	6.0	100.0
	Total	100	100.0	100.0	

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
I consider the introduction of the EPR a meaningful idea	100	1	5	4.16	.972
I am interested i using the EPR	100	1	5	3.84	1.032
Valid N (listwise)	100				

What usage form do you intent to adopt?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Aktive Nutzung	60	60.0	60.0	60.0
	Passive Nutzung	36	36.0	36.0	96.0
	Opt-out	4	4.0	4.0	100.0
	Total	100	100.0	100.0	

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
I feel compentent in using health applications, such as the EPR	100	1	5	4.24	.955
I feel confident, that with suppprt or training, I am able to use the application for an EPR.	100	1	5	4.37	.837
Valid N (listwise)	100				

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Opinion of my doctors	100	1	5	3.65	.957
Opinion of my Family and Friends	100	1	5	2.60	.995
Opinion of of SHI	100	1	5	2.85	1.038
Valid N (listwise)	100				

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Postal Communication	100	1	5	3.04	1.294
Telephone Communication	100	1	4	1.96	1.063
Social-Media Communication	100	1	5	2.39	1.118
Magazines	100	1	5	2.62	1.144
E-Mail	100	1	5	3.04	1.238
Homepage Communication	100	1	5	4.02	.853
Chatbot	100	1	5	3.31	1.220
Valid N (listwise)	100				

Hypothesis 1

Factor Analysis: Ability to Use

Correlation Matrix

		I feel confident in handling electronic devices such as computers, tablets or smartphones	I feel compentent in using health applications, such as the EPR	I feel confident, that with suppprt or training, I am able to use the application for an EPR.
Correlation	I feel confident in handling electronic devices such as computers, tablets or smartphones	1.000	.910	.655
	I feel compentent in using health applications, such as the EPR	.910	1.000	.659
	I feel confident, that with suppprt or training, I am able to use the application for an EPR.	.655	.659	1.000

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.684
Bartlett's Test of Sphericity	Approx. Chi-Square	230.035
	df	3
	Sig.	<.001

Communalities

	Initial	Extraction
I feel confident in handling electronic devices such as computers, tablets or smartphones	1.000	.895
I feel compentent in using health applications, such as the EPR	1.000	.898
I feel confident, that with suppprt or training, I am able to use the application for an EPR.	1.000	.697

Extraction Method: Principal Component Analysis.

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.490	83.003	83.003	2.490	83.003	83.003
2	.420	14.012	97.015			
3	.090	2.985	100.000			

Extraction Method: Principal Component Analysis.

Factor Analysis: Motivation to adopt

Correlation Matrix

		Transparency into personal health data	Better medical care	Faster Exchange of personal health data	A tool for patient emplowerment	Reduction of medical Errors
Correlation	Transparency into personal health data	1.000	.658	.711	.563	.681
	Better medical care	.658	1.000	.588	.637	.558
	Faster Exchange of personal health data	.711	.588	1.000	.506	.574
	A tool for patient emplowerment	.563	.637	.506	1.000	.585
	Reduction of medical Errors	.681	.558	.574	.585	1.000

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.850
Bartlett's Test of Sphericity	Approx. Chi-Square	258.364
	df	10
	Sig.	<.001

Communalities

	Initial	Extraction
Transparency into personal health data	1.000	.771
Better medical care	1.000	.692
Faster Exchange of personal health data	1.000	.668
A tool for patient emplowerment	1.000	.624
Reduction of medical Errors	1.000	.674

Extraction Method: Principal Component Analysis.

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.429	68.573	68.573	3.429	68.573	68.573
2	.545	10.896	79.469			
3	.443	8.866	88.336			
4	.337	6.730	95.066			
5	.247	4.934	100.000			

Extraction Method: Principal Component Analysis.

Factor Analysis: Subjective Influence

Correlation Matrix

		Opinion of my doctors	Opinion of my Family and Friends	Opinion of of SHI
Correlation	Opinion of my doctors	1.000	.276	.404
	Opinion of my Family and Friends	.276	1.000	.508
	Opinion of of SHI	.404	.508	1.000

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.614
Bartlett's Test of Sphericity	Approx. Chi-Square	47.136
	df	3
	Sig.	<.001

Communalities

	Initial	Extraction
Opinion of my doctors	1.000	.482
Opinion of my Family and Friends	1.000	.603
Opinion of of SHI	1.000	.714

Extraction Method: Principal Component Analysis.

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.799	59.983	59.983	1.799	59.983	59.983
2	.735	24.504	84.487			
3	.465	15.513	100.000			

Extraction Method: Principal Component Analysis.

Factor Analysis: Attitude towards EPR

Correlation Matrix

		I consider the introduction of the EPR a meaningful idea	I like the introduction of the EPR	I am interested i using the EPR	I have concerns and reservations regarding the introduction of the EPR
Correlation	I consider the introduction of the EPR a meaningful idea	1.000	.860	.701	.633
	I like the introduction of the EPR	.860	1.000	.736	.588
	I am interested i using the EPR	.701	.736	1.000	.364
	I have concerns and reservations regarding the introduction of the EPR	.633	.588	.364	1.000

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.777
Bartlett's Test of Sphericity	Approx. Chi-Square	264.474
	df	6
	Sig.	<.001

Communalities

	Initial	Extraction
I consider the introduction of the EPR a meaningful idea	1.000	.879
I like the introduction of the EPR	1.000	.877
I am interested i using the EPR	1.000	.673
I have concerns and reservations regarding the introduction of the EPR	1.000	.538

Extraction Method: Principal Component Analysis.

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.967	74.174	74.174	2.967	74.174	74.174
2	.648	16.211	90.385			
3	.248	6.205	96.589			
4	.136	3.411	100.000			

Extraction Method: Principal Component Analysis.

Multiple Linear Regression

Correlations

		Attitude towards EPR	Subjective Influence	Motivation to Adopt	Ability to Adopt
Pearson Correlation	Attitude towards EPR	1.000	.286	.798	.546
	Subjective Influence	.286	1.000	.266	.041
	Motivation to Adopt	.798	.266	1.000	.563
	Ability to Adopt	.546	.041	.563	1.000
Sig. (1-tailed)	Attitude towards EPR	.	.002	<.001	<.001
	Subjective Influence	.002	.	.004	.343
	Motivation to Adopt	.000	.004	.	.000
	Ability to Adopt	.000	.343	.000	.
N	Attitude towards EPR	100	100	100	100

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.812[a]	.660	.649	.59255264

a. Predictors: (Constant), Ability to Adopt, Subjective Influence , Motivation to Adopt

b. Dependent Variable: Attitude towards EPR

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	65.293	3	21.764	61.985	<.001[b]
	Residual	33.707	96	.351		
	Total	99.000	99			

a. Dependent Variable: Attitude towards EPR

b. Predictors: (Constant), Ability to Adopt, Subjective Influence , Motivation to Adopt

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	1.472E-16	.059		.000	1.000		
	Subjective Influence	.097	.062	.097	1.558	.123	.912	1.097
	Motivation to Adopt	.684	.075	.684	9.069	<.001	.624	1.603
	Ability to Adopt	.157	.073	.157	2.161	.033	.670	1.492

a. Dependent Variable: Attitude towards EPR

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions			
				(Constant)	Subjective Influence	Motivation to Adopt	Ability to Adopt
1	1	1.639	1.000	.00	.06	.19	.17
	2	1.000	1.280	1.00	.00	.00	.00
	3	.968	1.301	.00	.77	.00	.13
	4	.392	2.044	.00	.17	.81	.71

a. Dependent Variable: Attitude towards EPR

Hypothesis 2

Levene's Test of Equality of Error Variances[a,b]

		Levene Statistic	df1	df2	Sig.
Attitude towards EPR	Based on Mean	1.562	17	41	.121
	Based on Median	.942	17	41	.535
	Based on Median and with adjusted df	.942	17	20.167	.545
	Based on trimmed mean	1.500	17	41	.143

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Dependent variable: Attitude towards EPR

b. Design: Intercept + Age + Gender + Workstatus + Education + Age * Gender + Age * Workstatus + Age * Education + Gender * Workstatus + Gender * Education + Workstatus * Education + Age * Gender * Workstatus + Age * Gender * Education + Age * Workstatus * Education + Gender * Workstatus * Education + Age * Gender * Workstatus * Education

Tests of Between-Subjects Effects

Dependent Variable: Attitude towards EPR

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	60.350[a]	58	1.041	1.104	.373	.610
Intercept	.219	1	.219	.232	.633	.006
Age	6.761	4	1.690	1.793	.149	.149
Gender	.087	1	.087	.092	.763	.002
Workstatus	1.737	5	.347	.369	.867	.043
Education	4.485	4	1.121	1.189	.330	.104
Age * Gender	.907	3	.302	.321	.810	.023
Age * Workstatus	6.578	3	2.193	2.326	.089	.145
Age * Education	5.097	5	1.019	1.081	.385	.117
Gender * Workstatus	3.025	3	1.008	1.070	.373	.073
Gender * Education	2.066	3	.689	.731	.540	.051
Workstatus * Education	17.450	9	1.939	2.057	.057	.311
Age * Gender * Workstatus	.000	0	.	.	.	.000
Age * Gender * Education	.000	0	.	.	.	.000
Age * Workstatus * Education	.000	0	.	.	.	.000
Gender * Workstatus * Education	.000	0	.	.	.	.000
Age * Gender * Workstatus * Education	.000	0	.	.	.	.000
Error	38.650	41	.943			
Total	99.000	100				
Corrected Total	99.000	99				

a. R Squared = .610 (Adjusted R Squared = .057)

Hypothesis 3

Attitude towards EPR x Age

Crosstab

			What usage form do you intent to adopt?			
			Aktive Nutzung	Passive Nutzung	Opt-out	Total
Age	18-24	Count	6	5	0	11
		% within What usage form do you intent to adopt?	10.0%	13.9%	0.0%	11.0%
	25-35	Count	25	9	2	36
		% within What usage form do you intent to adopt?	41.7%	25.0%	50.0%	36.0%
	36-49	Count	6	1	0	7
		% within What usage form do you intent to adopt?	10.0%	2.8%	0.0%	7.0%
	50-64	Count	15	12	1	28
		% within What usage form do you intent to adopt?	25.0%	33.3%	25.0%	28.0%
	65 Jahre und älter	Count	8	9	1	18
		% within What usage form do you intent to adopt?	13.3%	25.0%	25.0%	18.0%
Total		Count	60	36	4	100
		% within What usage form do you intent to adopt?	100.0%	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	7.085[a]	8	.527
Likelihood Ratio	8.006	8	.433
Linear-by-Linear Association	1.812	1	.178
N of Valid Cases	100		

a. 8 cells (53.3%) have expected count less than 5. The minimum expected count is .28.

Attitude towards EPR x Gender

Crosstab

			What usage form do you intent to adopt?			
			Aktive Nutzung	Passive Nutzung	Opt-out	Total
Gender	Männlich	Count	23	9	0	32
		% within What usage form do you intent to adopt?	38.3%	25.0%	0.0%	32.0%
	Weiblich	Count	37	27	4	68
		% within What usage form do you intent to adopt?	61.7%	75.0%	100.0%	68.0%
Total		Count	60	36	4	100
		% within What usage form do you intent to adopt?	100.0%	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	3.799[a]	2	.150
Likelihood Ratio	5.005	2	.082
Linear-by-Linear Association	3.597	1	.058
N of Valid Cases	100		

a. 2 cells (33.3%) have expected count less than 5. The minimum expected count is 1.28.

Attitude towards EPR x Employment Status

Crosstab

			What usage form do you intent to adopt?			
			Aktive Nutzung	Passive Nutzung	Opt-out	Total
Employment Status	Vollzeitbeschäftigung	Count	24	15	2	41
		% within What usage form do you intent to adopt?	40.0%	41.7%	50.0%	41.0%
	Teilzeitbeschäftigung	Count	9	7	0	16
		% within What usage form do you intent to adopt?	15.0%	19.4%	0.0%	16.0%
	Selbstständig	Count	7	0	0	7
		% within What usage form do you intent to adopt?	11.7%	0.0%	0.0%	7.0%
	Student	Count	9	4	0	13
		% within What usage form do you intent to adopt?	15.0%	11.1%	0.0%	13.0%
	Im Ruhestand	Count	9	10	2	21
		% within What usage form do you intent to adopt?	15.0%	27.8%	50.0%	21.0%
	Arbeitssuchend	Count	2	0	0	2
		% within What usage form do you intent to adopt?	3.3%	0.0%	0.0%	2.0%
Total		Count	60	36	4	100
		% within What usage form do you intent to adopt?	100.0%	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	11.263[a]	10	.337
Likelihood Ratio	15.183	10	.126
Linear-by-Linear Association	.116	1	.733
N of Valid Cases	100		

a. 11 cells (61.1%) have expected count less than 5. The minimum expected count is .08.

Attitude towards EPR x Education Level

Crosstab

			What usage form do you intent to adopt?			
			Aktive Nutzung	Passive Nutzung	Opt-out	Total
Education Status	Abitur /Mittlere Reife	Count	8	7	1	16
		% within What usage form do you intent to adopt?	13.3%	19.4%	25.0%	16.0%
	Abgeschlossene Berufsausbildung	Count	11	8	0	19
		% within What usage form do you intent to adopt?	18.3%	22.2%	0.0%	19.0%
	Bachelor-Abschluss /Diplom-Abschluss	Count	15	5	1	21
		% within What usage form do you intent to adopt?	25.0%	13.9%	25.0%	21.0%
	Master-Abschluss / Magister	Count	22	14	2	38
		% within What usage form do you intent to adopt?	36.7%	38.9%	50.0%	38.0%
	Sonstiges	Count	4	2	0	6
		% within What usage form do you intent to adopt?	6.7%	5.6%	0.0%	6.0%
Total		Count	60	36	4	100
		% within What usage form do you intent to adopt?	100.0%	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	3.545[a]	8	.896
Likelihood Ratio	4.579	8	.801
Linear-by-Linear Association	.265	1	.607
N of Valid Cases	100		

a. 7 cells (46.7%) have expected count less than 5. The minimum expected count is .24.

Hypothesis 4a: Postal Communication

Levene's Test of Equality of Error Variances[a,b]

		Levene Statistic	df1	df2	Sig.
Postal Communication	Based on Mean	2.417	17	41	.541
	Based on Median	.665	17	41	.818
	Based on Median and with adjusted df	.665	17	22.619	.804
	Based on trimmed mean	2.243	17	41	.018

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Dependent variable: Postal Communication

b. Design: Intercept + Age + Gender + Workstatus + Education + Age * Gender + Age * Workstatus + Age * Education + Gender * Workstatus + Gender * Education + Workstatus * Education + Age * Gender * Workstatus + Age * Gender * Education + Age * Workstatus * Education + Gender * Workstatus * Education + Age * Gender * Workstatus * Education

Tests of Between-Subjects Effects

Dependent Variable: Postal Communication

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	89.659[a]	58	1.546	.832	.743	.541
Intercept	326.674	1	326.674	175.813	<.001	.811
Age	6.906	4	1.726	.929	.046	.083
Gender	.560	1	.560	.302	.586	.007
Workstatus	4.982	5	.996	.536	.748	.061
Education	3.378	4	.845	.455	.038	.042
Age * Gender	2.125	3	.708	.381	.767	.027
Age * Workstatus	10.276	3	3.425	1.843	.154	.119
Age * Education	7.870	5	1.574	.847	.524	.094
Gender * Workstatus	6.533	3	2.178	1.172	.332	.079
Gender * Education	3.022	3	1.007	.542	.656	.038
Workstatus * Education	12.428	9	1.381	.743	.668	.140
Age * Gender * Workstatus	.000	0	.	.	.	.000
Age * Gender * Education	.000	0	.	.	.	.000
Age * Workstatus * Education	.000	0	.	.	.	.000
Gender * Workstatus * Education	.000	0	.	.	.	.000
Age * Gender * Workstatus * Education	.000	0	.	.	.	.000
Error	76.181	41	1.858			
Total	1090.000	100				
Corrected Total	165.840	99				

a. R Squared = .541 (Adjusted R Squared = -.109)

Hypothesis 4b: Chatbot Communication

Levene's Test of Equality of Error Variances[a,b]

		Levene Statistic	df1	df2	Sig.
Chatbot	Based on Mean	1.318	17	41	.230
	Based on Median	.673	17	41	.810
	Based on Median and with adjusted df	.673	17	21.330	.795
	Based on trimmed mean	1.203	17	41	.305

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Dependent variable: Chatbot

b. Design: Intercept + Age + Gender + Workstatus + Education + Age * Gender + Age * Workstatus + Age * Education + Gender * Workstatus + Gender * Education + Workstatus * Education + Age * Gender * Workstatus + Age * Gender * Education + Age * Workstatus * Education + Gender * Workstatus * Education + Age * Gender * Workstatus * Education

Tests of Between-Subjects Effects

Dependent Variable: Chatbot

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	105.595[a]	58	1.821	1.786	.026	.716
Intercept	453.642	1	453.642	445.011	<.001	.916
Age	6.630	4	1.657	1.626	.004	.137
Gender	.727	1	.727	.713	.403	.017
Workstatus	5.304	5	1.061	1.041	.407	.113
Education	7.052	4	1.763	1.729	.003	.144
Age * Gender	1.931	3	.644	.632	.599	.044
Age * Workstatus	12.582	3	4.194	4.114	.012	.231
Age * Education	5.562	5	1.112	1.091	.380	.117
Gender * Workstatus	4.176	3	1.392	1.365	.267	.091
Gender * Education	5.749	3	1.916	1.880	.148	.121
Workstatus * Education	15.249	9	1.694	1.662	.130	.267
Age * Gender * Workstatus	.000	0	.	.	.	.000
Age * Gender * Education	.000	0	.	.	.	.000
Age * Workstatus * Education	.000	0	.	.	.	.000
Gender * Workstatus * Education	.000	0	.	.	.	.000
Age * Gender * Workstatus * Education	.000	0	.	.	.	.000
Error	41.795	41	1.019			
Total	1243.000	100				
Corrected Total	147.390	99				

a. R Squared = .716 (Adjusted R Squared = .315)

Hypothesis 4c: Social Media Communication

Levene's Test of Equality of Error Variances[a,b]

		Levene Statistic	df1	df2	Sig.
Social-Media Communication	Based on Mean	4.432	17	41	.856
	Based on Median	1.563	17	41	.121
	Based on Median and with adjusted df	1.563	17	22.977	.158
	Based on trimmed mean	4.193	17	41	<.001

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Dependent variable: Social-Media Communication

b. Design: Intercept + Age + Gender + Workstatus + Education + Age * Gender + Age * Workstatus + Age * Education + Gender * Workstatus + Gender * Education + Workstatus * Education + Age * Gender * Workstatus + Age * Gender * Education + Age * Workstatus * Education + Gender * Workstatus * Education + Age * Gender * Workstatus * Education

Tests of Between-Subjects Effects

Dependent Variable: Social-Media Communication

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	76.661[a]	58	1.322	1.150	.322	.619
Intercept	235.587	1	235.587	204.952	<.001	.833
Age	12.923	4	3.231	2.811	.038	.215
Gender	2.171	1	2.171	1.888	.177	.044
Workstatus	5.981	5	1.196	1.041	.407	.113
Education	4.698	4	1.174	1.022	.407	.091
Age * Gender	6.832	3	2.277	1.981	.132	.127
Age * Workstatus	5.173	3	1.724	1.500	.229	.099
Age * Education	1.107	5	.221	.193	.964	.023
Gender * Workstatus	6.339	3	2.113	1.838	.155	.119
Gender * Education	6.121	3	2.040	1.775	.167	.115
Workstatus * Education	8.737	9	.971	.845	.580	.156
Age * Gender * Workstatus	.000	0	.	.	.	.000
Age * Gender * Education	.000	0	.	.	.	.000
Age * Workstatus * Education	.000	0	.	.	.	.000
Gender * Workstatus * Education	.000	0	.	.	.	.000
Age * Gender * Workstatus * Education	.000	0	.	.	.	.000
Error	47.129	41	1.149			
Total	695.000	100				
Corrected Total	123.790	99				

a. R Squared = .619 (Adjusted R Squared = .081)

Hypothesis 4d: Magazine Communication

Levene's Test of Equality of Error Variances[a,b]

		Levene Statistic	df1	df2	Sig.
Magazines	Based on Mean	6.014	17	41	.856
	Based on Median	.716	17	41	.769
	Based on Median and with adjusted df	.716	17	19.768	.754
	Based on trimmed mean	5.643	17	41	<.001

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Dependent variable: Magazines

b. Design: Intercept + Age + Gender + Workstatus + Education + Age * Gender + Age * Workstatus + Age * Education + Gender * Workstatus + Gender * Education + Workstatus * Education + Age * Gender * Workstatus + Age * Gender * Education + Age * Workstatus * Education + Gender * Workstatus * Education + Age * Gender * Workstatus * Education

Tests of Between-Subjects Effects

Dependent Variable: Magazines

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	62.943[a]	58	1.085	.668	.922	.486
Intercept	257.569	1	257.569	158.522	<.001	.795
Age	9.487	4	2.372	1.460	.232	.125
Gender	2.778	1	2.778	1.710	.198	.040
Workstatus	1.229	5	.246	.151	.979	.018
Education	4.094	4	1.024	.630	.644	.058
Age * Gender	4.884	3	1.628	1.002	.402	.068
Age * Workstatus	5.384	3	1.795	1.105	.358	.075
Age * Education	2.962	5	.592	.365	.870	.043
Gender * Workstatus	5.490	3	1.830	1.126	.350	.076
Gender * Education	.635	3	.212	.130	.942	.009
Workstatus * Education	10.307	9	1.145	.705	.701	.134
Age * Gender * Workstatus	.000	0	.	.	.	.000
Age * Gender * Education	.000	0	.	.	.	.000
Age * Workstatus * Education	.000	0	.	.	.	.000
Gender * Workstatus * Education	.000	0	.	.	.	.000
Age * Gender * Workstatus * Education	.000	0	.	.	.	.000
Error	66.617	41	1.625			
Total	816.000	100				
Corrected Total	129.560	99				

a. R Squared = .486 (Adjusted R Squared = -.242)

Hypothesis 4e: E-Mail Communication

Levene's Test of Equality of Error Variances[a,b]

		Levene Statistic	df1	df2	Sig.
E-Mail	Based on Mean	1.631	17	41	.100
	Based on Median	.702	17	41	.783
	Based on Median and with adjusted df	.702	17	22.651	.771
	Based on trimmed mean	1.531	17	41	.132

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Dependent variable: E-Mail

b. Design: Intercept + Age + Gender + Workstatus + Education + Age * Gender + Age * Workstatus + Age * Education + Gender * Workstatus + Gender * Education + Workstatus * Education + Age * Gender * Workstatus + Age * Gender * Education + Age * Workstatus * Education + Gender * Workstatus * Education + Age * Gender * Workstatus * Education

Tests of Between-Subjects Effects

Dependent Variable: E-Mail

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	87.820[a]	58	1.514	.970	.549	.578
Intercept	328.569	1	328.569	210.424	<.001	.837
Age	6.413	4	1.603	1.027	.405	.091
Gender	.032	1	.032	.020	.887	.000
Workstatus	7.321	5	1.464	.938	.467	.103
Education	6.247	4	1.562	1.000	.418	.089
Age * Gender	1.411	3	.470	.301	.824	.022
Age * Workstatus	4.488	3	1.496	.958	.422	.066
Age * Education	16.498	5	3.300	2.113	.083	.205
Gender * Workstatus	8.929	3	2.976	1.906	.144	.122
Gender * Education	3.114	3	1.038	.665	.578	.046
Workstatus * Education	30.462	9	3.385	2.168	.045	.322
Age * Gender * Workstatus	.000	0	.	.	.	.000
Age * Gender * Education	.000	0	.	.	.	.000
Age * Workstatus * Education	.000	0	.	.	.	.000
Gender * Workstatus * Education	.000	0	.	.	.	.000
Age * Gender * Workstatus * Education	.000	0	.	.	.	.000
Error	64.020	41	1.561			
Total	1076.000	100				
Corrected Total	151.840	99				

a. R Squared = .578 (Adjusted R Squared = -.018)

Hypothesis 4f: Website Communication

Levene's Test of Equality of Error Variances[a,b]

		Levene Statistic	df1	df2	Sig.
Homepage Communication	Based on Mean	2.012	17	41	.034
	Based on Median	.461	17	41	.957
	Based on Median and with adjusted df	.461	17	14.903	.937
	Based on trimmed mean	1.811	17	41	.061

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Dependent variable: Homepage Communication

b. Design: Intercept + Age + Gender + Workstatus + Education + Age * Gender + Age * Workstatus + Age * Education + Gender * Workstatus + Gender * Education + Workstatus * Education + Age * Gender * Workstatus + Age * Gender * Education + Age * Workstatus * Education + Gender * Workstatus * Education + Age * Gender * Workstatus * Education

Tests of Between-Subjects Effects

Dependent Variable: Homepage Communication

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	34.631[a]	58	.597	.656	.931	.481
Intercept	721.117	1	721.117	792.025	<.001	.951
Age	1.671	4	.418	.459	.765	.043
Gender	1.839	1	1.839	2.019	.163	.047
Workstatus	2.208	5	.442	.485	.785	.056
Education	1.837	4	.459	.504	.733	.047
Age * Gender	.952	3	.317	.349	.790	.025
Age * Workstatus	.416	3	.139	.152	.928	.011
Age * Education	3.442	5	.688	.756	.587	.084
Gender * Workstatus	.957	3	.319	.350	.789	.025
Gender * Education	5.775	3	1.925	2.114	.113	.134
Workstatus * Education	3.555	9	.395	.434	.909	.087
Age * Gender * Workstatus	.000	0	.	.	.	.000
Age * Gender * Education	.000	0	.	.	.	.000
Age * Workstatus * Education	.000	0	.	.	.	.000
Gender * Workstatus * Education	.000	0	.	.	.	.000
Age * Gender * Workstatus * Education	.000	0	.	.	.	.000
Error	37.329	41	.910			
Total	1688.000	100				
Corrected Total	71.960	99				

a. R Squared = .481 (Adjusted R Squared = -.253)

Hypothesis 4g: Phone Communication

Levene's Test of Equality of Error Variances[a,b]

		Levene Statistic	df1	df2	Sig.
Telephone Communication	Based on Mean	2.564	17	41	.113
	Based on Median	.809	17	41	.674
	Based on Median and with adjusted df	.809	17	21.764	.669
	Based on trimmed mean	2.369	17	41	.012

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Dependent variable: Telephone Communication

b. Design: Intercept + Age + Gender + Workstatus + Education + Age * Gender + Age * Workstatus + Age * Education + Gender * Workstatus + Gender * Education + Workstatus * Education + Age * Gender * Workstatus + Age * Gender * Education + Age * Workstatus * Education + Gender * Workstatus * Education + Age * Gender * Workstatus * Education

Tests of Between-Subjects Effects

Dependent Variable: Telephone Communication

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	76.668[a]	58	1.322	1.541	.073	.686
Intercept	187.338	1	187.338	218.379	<.001	.842
Age	4.228	4	1.057	1.232	.312	.107
Gender	.821	1	.821	.957	.334	.023
Workstatus	8.286	5	1.657	1.932	.028	.019
Education	4.001	4	1.000	1.166	.340	.102
Age * Gender	2.136	3	.712	.830	.485	.057
Age * Workstatus	4.647	3	1.549	1.806	.161	.117
Age * Education	8.155	5	1.631	1.901	.115	.188
Gender * Workstatus	11.323	3	3.774	4.400	.009	.244
Gender * Education	.992	3	.331	.385	.764	.027
Workstatus * Education	12.353	9	1.373	1.600	.148	.260
Age * Gender * Workstatus	.000	0	.	.	.	.000
Age * Gender * Education	.000	0	.	.	.	.000
Age * Workstatus * Education	.000	0	.	.	.	.000
Gender * Workstatus * Education	.000	0	.	.	.	.000
Age * Gender * Workstatus * Education	.000	0	.	.	.	.000
Error	35.172	41	.858			
Total	496.000	100				
Corrected Total	111.840	99				

a. R Squared = .686 (Adjusted R Squared = .241)