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## Assignment Cover Sheet

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**PHARMACY IN THE DIGITAL AGE: EXPLORING  
ADULTS' TRUST, AWARENESS, AND ADOPTION  
OF TECHNOLOGY-DRIVEN SERVICES**

**MSC DIGITAL TRANSFORMATION (LIFE SCIENCE)**

**GRIFFITH COLLEGE, DUBLIN**

**PRIYA MOHANAN**

**2025**

## DECLARATION

I hereby declare that the research titled "*Pharmacy in the Digital Age: Exploring Adults' Trust, Awareness, and Adoption of Technology-Driven Services*" is my original work. This study has been conducted in accordance with academic guidelines and ethical standards. All sources and references used in this research have been duly acknowledged, and proper citations have been provided. No part of this work has been copied from any other source, and it has not been submitted elsewhere for any academic credit. I take full responsibility for the accuracy and integrity of the research presented. This work is submitted for the purpose of academic evaluation, and I have followed all the necessary procedures for the completion of this study.

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## **LIST OF ABBREVIATION**

**CAGR** - Compound Annual Growth Rate

**DTP** - Digital Trust Framework

**e-pharmacy** - Electronic Pharmacy

**EMR** - Electronic Medical Records

**IAES2** - International Association for Educational Support Systems

**TAM** - Technology Acceptance Model

**PEOU** - Perceived Ease of Use

**PU** - Perceived Usefulness

**SMARTER** - Specific, Measurable, Achievable, Relevant, Time-bound, Evaluated, and Reviewed

## ABSTRACT

This quantitative study examines the determinants of awareness and trust of digital pharmacy services and adoption by adults, with the goal of understanding how demographic, behavioural and technological variables shape consumers' engagement with technology-based pharmaceutical care. The research had three major objectives to focus on. In order to study the factors that affect the awareness of digital pharmacy services, the role of trust in the adoption of these services and the barriers and facilitators that affect the uptake of these services. Data on a sample size of 143 people of different age groups and educational backgrounds, with a significant concentration in the 18–34 age group, was collected using a structured survey distributed online. The study used descriptive and regression analysis to determine the extent to which digital literacy, internet access, health literacy, and demographic traits influence awareness and adoption behaviours. Based on the findings, trust is the highest determinant of adoption whereby adoption is likely to occur when users believe in high levels of data privacy, security, and service reliability. Awareness also surfaced as a significant factor, though secondary to trust, better-informed users were shown to be more engaged. Those who are younger and more digitally as well as health literate were more likely to use digital pharmacy services, while the older adults and those with fewer digital skills were more resistant as a result of the concerns about usability and security. Lack of information, digital inaccessibility, and preference for traditional in person interactions were impediments more common in low income and elderly groups. While hypotheses on digital literacy and trust were directly strengthened by statistical evidence, health literacy and age relations were mostly inferred from descriptive insights. Overall, the study finds that digital pharmacy services can only be successfully implemented if user trust is improved, public awareness increased, and digital inequalities addressed, especially among the underserved populations. These results have essential implications for policymakers, healthcare providers and developers of digital health to expand reach and equity of digital pharmacy solutions.

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## **CHAPTER 1: INTRODUCTION**

The exponential growth in the use of technology in the health sector, especially within the field of pharma. Technological advances like, electronic prescribing, tele pharmacy, and robotic dispensing are some of the ways in which an individual can receive prescription drugs. This have created a way through which change can be brought within the delivery of healthcare, especially to patients, who cannot move from home or those in remote areas who cannot access any other pharmacy services (Singh & Kumar, 2024). However, the usage of these services depends on several factors such as trust, perceived awareness and the demographic factors.

The lack of knowledge and awareness is one of the initiating factors often found among elderly and people with low levels of digital literacy (Charac, 2023). Digital pharmacies are more familiar and actively used by the younger generation and those who are more engaged in the use of digital platforms (Singh & Kumar, 2024). Cognitive factors also affect the readiness of the individuals regarding utilization of these services, implying the importance of raising awareness.

Another factor that has influenced the acceptance of the services is trust. When it comes to the exploration of services online, patients' focus on the security of their own health information (Ezeudoka & Fan, 2024). Privacy policy, well implement protection measures for data and fast and efficient delivery of services could help in developing public trusts and encourage people to use digital pharmacy platforms (Sulistyaningrum et al., 2023).

Age, IT literacy level, and HL are other demographic factors that impact the level of adoption of the technology. Some of the barriers to use of digital pharmacy services include; the young that have high access to technology and older people who may lack adequate skills in technology (Miller et al., 2024). Knowledge of these issues is important in the promotion of access and utilization of pharmacy services through the internet to a wider populace across the population:

### **1.1 Background**

The advancement in technology has led to delivery of services in the health sector where their pharmacy has not been left behind through technology solutions. Technological

advances in the area of pharmacy include e-prescriptions, tele pharmacy, and automated dispensing of medicines, which have become highly valuable in improving the pharmaceutical services particularly to those who have poor access to physical pharmacies (Ezeudoka & Fan, 2024). However, the use of these services depends on some parameters such as trust, awareness, and technology among the users.

Lack of awareness of the digital pharmacy services is a concern as it is established that awareness differs among the different generations with the younger generation and the tech-savvy being conversant with the digital pharmacies as compared to the older population and those with low literacy in technology (Singh & Kumar, 2024). The lack of awareness reduces the willingness to use these services especially for the neglected groups (Charac, 2023). Likewise, the trust is another factor for adoption, as people are concerned with the protection of their information when accessing healthcare services using the internet. Thus, it can be encouraged for the security policies to be communicated clearly to the users and strong guarantee measures to be implemented for data protection (Ezeudoka & Fan, 2024; Sulistyaningrum et al., 2023).

Barriers to the adoption of digital pharmacy services include technology phobia and a lack of privacy from face-to-face interaction especially for people of the older age and those with limited access to the internet (Miller et al., 2024). Nevertheless, the market for online pharmacy is still constantly expanding; according to recent studies, the market in Europe, especially in Great Britain, is rapidly developing due to the audience's focus on using the Internet on mobile devices primarily women (E-Pharmacy, 2025). To overcome these barriers, increasing awareness and knowledge of the opportunities offered by digital pharmacy, the effectiveness of educational campaigns, and improvements to the digital competencies of patients are necessary to improve the availability and utilization of digital pharmacy services for clients of different demographics.

## **1.2 Research Aim**

This study aims to investigate adults' levels of trust, awareness, and adoption of technology-driven pharmacy services. It specifically aims to investigate the ways in which demographic characteristics like age and health literacy, privacy concerns, and digital literacy affect the adoption and use of digital pharmacy services. The study aims

to provide insights that can help improve the reach and equity of digital pharmacy solutions among diverse population groups by identifying the enablers and barriers.

### **1.3 Research Objectives**

#### **1. Objective 1: To Explore the Factors Influencing Awareness of Digital Pharmacy Services**

This objective aims to investigate how various factors, such as digital literacy, education, exposure to technology, and demographic characteristics (age, health literacy), influence individuals' awareness of digital pharmacy services. It will explore the role of information, education, and communication in increasing awareness and addressing gaps in knowledge about digital pharmacy offerings, especially among older adults and those with lower digital literacy.

#### **2. Objective 2: To Examine the Role of Trust in the Adoption of Digital Pharmacy Services**

This objective focuses on understanding how trust in digital pharmacy services is shaped by factors such as data security, privacy, transparency, and the reliability of the service. The research will analyze how the perceptions of trust, influenced by the visibility of service providers, the accuracy of information, and user experiences, affect the adoption of technology-driven pharmacy services, especially in different demographic groups.

#### **3. Objective 3: To Identify Barriers and Facilitators of the Adoption of Digital Pharmacy Services**

The third objective examines the demographic, behavioural, and technological factors that act as barriers or facilitators in the adoption of digital pharmacy services. It will focus on how issues such as usability concerns, technological apprehension, access to internet services, and the need for face-to-face interactions hinder or encourage the uptake of digital pharmacy services, with particular attention to older adults, low-income groups, and those with limited digital or health literacy.

## **1.4 Research Questions**

1. How does awareness of digital pharmacy services vary across different demographic groups, and what factors influence individuals' knowledge and perceptions of these services?
2. What are the key trust factors (such as data security, privacy, and service reliability) that influence the adoption of digital pharmacy services, and how do they vary among different age groups and health literacy levels?
3. What are the main barriers to the adoption of digital pharmacy services, particularly among older adults and individuals with low digital literacy, and what strategies can be implemented to overcome these barriers?

## **1.5 Research rationale**

The use of information technology in the pharmacy care has improved the delivery of care through to clients through some convenience, ease of access and affordability. However, an emerging form of service, namely digital pharmacy services, is still affected by numerous factors in terms of its adoption and level of trust. It is noteworthy that studies on "Pharmacy in the Digital Age" to appreciate the influences of these aspects such as awareness, trust, adoption from one demographic to another. Being a member of the family of digital services, its awareness differs among those receiving the services with respondents from young aged and computer literate being more involved in the digital pharmacy services (Singh & Kumar, 2024). On the other hand, elder peoples and those with LD (digital literacy) have many issues with access (Charac, 2023).

Security and privacy are always a concern to users since they are concerned about the security of their data and especially health information when engaging in digital pharmacy services (Ezeudoka & Fan, 2024). Research has revealed that communication about how data will be processed and what measures will be taken to ensure users' privacy will go a long way to actually increase the level of trust among users (Sulistyaningrum et al., 2023). In addition, the young and tech-savvy users are the majority in using the digital pharmacy services and conversely the use of digital pharmacy services can be a dilemma for the old people who may have technophobia and prioritize face-to-face communication (Sampene et al., 2024).

Therefore, this research seeks to fill these gaps through investigating the determinants of trust, awareness and adoption of digital pharmacy services. This information may be valuable in perhaps seeking ways of increasing the use of such services given the shortcomings in areas such as use by those in the low-income bracket or those with other forms of vulnerability. Furthermore, this may necessitate sensitization and offer of proper digital literacy and training, improvement of measures of data security and privacy to boost the use by all categories of people (Singh & Kumar, 2024; Ezeudoka & Fan, 2024).

## **1.6 Research significance**

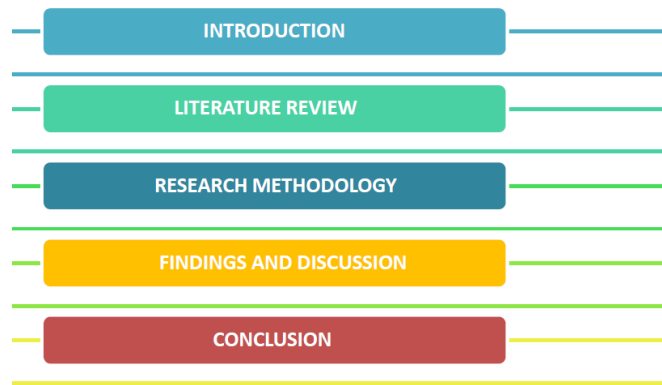
The analysis of the article “Pharmacy in the Digital Age: As a follow, up to the study of “Exploring Adults’ Trust, Awareness, and Adoption of Technology-Driven Services”, the current resource is highly useful in identifying the increasing use of pharmacy services technology and dynamics in shaping the future of health care. It emphasizes emerged application like e-prescriptions, tele pharmacy and other connected sections like Trust, awareness, and the adoption of the whole society with specific focus to older people and population with low tender literacy. These are crucial in eradicating barriers to the implementation and providing equal opportunities for the provision of digital pharmacy services (Singh & Kumar, 2024; Sampene et al., 2024).

Their value is thus in their capacity to contribute to the development of interventions that can promote the perception of trust in digital pharmacy platforms. When gaps in knowledge exist, awareness campaigns can help better educate the users especially those from the older adult age group and harder to reach groups like those who are underserved (Charac, 2023). Furthermore, trust is found to be an influential factor for adjustment in reference to data confidentiality and protection (Ezeudoka & Fan, 2024). Thus, understanding how these factors affect the behaviour of consumers shall help in building better user-controlled and user-appreciated digital pharmacy platforms that address and uphold issues to do with transparency, privacy, and convenience (Sulistyaningrum et al., 2023).

Furthermore, knowledge about the interactions of age and digital literacy also proves useful while developing the strategy for delivery of digital pharmacy services to minimize resistance among the various groups affected (Miller et al., 2024). Realizing the rising market for digital pharmacies particularly pegged at 11% CAGR till 2028 (E-Pharmacy,

2025), this study fills the existing gap and provides a much-needed systemic way of enhancing the uptake and utilization of these services particularly on exercising a bearing on healthcare inequalities (Ezeudoka & Fan, 2024).

### 1.7 Dissertation Structure



*Figure 1: Overview of Dissertation Structure (Chapters 1–5)*

This figure shows that the dissertation is divided into five chapters. Chapter one is about the background, research question, and the rationale of the study. Chapter 2 reviews relevant literature. Chapter 3 presents the research methodology. Chapter 3 focuses on methods of data collection and data analysis. Top-chapter 4 focuses on findings in relation to research questions at hand. Chapter five marks the last of the dissertation, and it encompasses various conclusions and recommendations on the future work. The structure adopted here bears emanates from the formulation of the problem to the conclusion hence ensuring that there is strong framework of approaching the research objectives as presented by the students.

## **2 CHAPTER 2: LITERATURE REVIEW**

Literature review of the current literature regarding the study of “Pharmacy in the Digital Age: Investigating on the services delivered through technology among adults where they have as objectives; their trust, awareness level as well as their adoption of the services. The literature is divided into three main groups in relation to the three objectives of the study: a detailed description of the digital pharmacy services, an examination of the antecedents to trust and awareness of digital pharmacy services, and the enablers and barriers to the adoption of digital pharmacy services. All of them are linked to the research questions, in an attempt to identify the role of trust in the utilisation of the digital pharmacy services, the factors that influence awareness and utilisation, as well as the factors that hinder the adoption of the services, with a special emphasis on the demographic factors.

### **Objective 1: Awareness of Digital Pharmacy Services**

This research analyses how public understanding of digital pharmaceutical services develops through several elements including digital proficiency and educational level and technology exposure. Digital pharmacy services awareness demonstrates inconsistent distribution between different population groups according to research. Individuals who understand digital platforms best take advantage of these services yet population groups with limited digital skills face barriers when trying to access them (Singh & Kumar, 2024). Knowledge about digital services directly impacts how people perceive the digital offerings which pharmacacies make available to customers. Most adults remain ignorant about digital pharmacy services which creates a major impediment to their adoption (Charac, 2023).

### **Objective 2: Trust in Digital Pharmacy Services**

The second research objectives underline factors of trust in the context of the digital pharmacy service, namely secured information, patient’s privacy, and visibility of the service companies. digital services rely on trust and as a result, in the case of digital pharmacies, what is of concern is data security and encryption (Ezeudoka & Fan, 2024). By investigating the role of information sharing on trust toward data processing policies

and protection measures for digital facilities like the pharmacy, Sulistyaningrum et al. (2023) show that uncovers the insecurity in the lack of information sharing on the policies. Moreover, the reliability of the information that doctors possess as well as the trust that the corresponding healthcare applications belong to also play an important role too (Gong et al., 2024). There are also the aspects of expertise which belong to the pharmacy team and the role, which is generally immense for the pharmacist becomes questionable when patients consider that the staff is not sufficiently knowledgeable (Te Paske et al., 2023).

### **Objective 3: Adoption of Digital Pharmacy Services**

The third research objectives reflect demographic and actual behaviour factors that affect the take up of the pharmacy services that are digital. This also mean that the young persons or those that have high exposure to technologies are those that consider these services and products first. Another behavioural factor that also affects this is; convenience, past experience with online purchase, and past experience with telemedicine (Sampene et al., 2024; convenience, prior experience at doing online purchase, and prior experience in telemedicine (Sampene et al., 2024; Miller et al., 2024).

*Table 1: Comparative Analysis of Different Studies on Digital Pharmacy Services*

<b>Focus of Study</b>	<b>Key Findings</b>	<b>Author(s)</b>
Awareness of Digital Pharmacy Services	Digital literacy, education, and exposure to technology significantly shape individuals' awareness of digital pharmacy services. Younger individuals are more aware, while older adults and those with low digital literacy face challenges in accessing services.	Singh & Kumar (2024)
Trust in Digital Pharmacy Services	Trust is a major factor in adoption. Concerns over data security, patient privacy, and the credibility of pharmacy staff influence users' perceptions of digital pharmacy services.	Ezeudoka & Fan (2024)

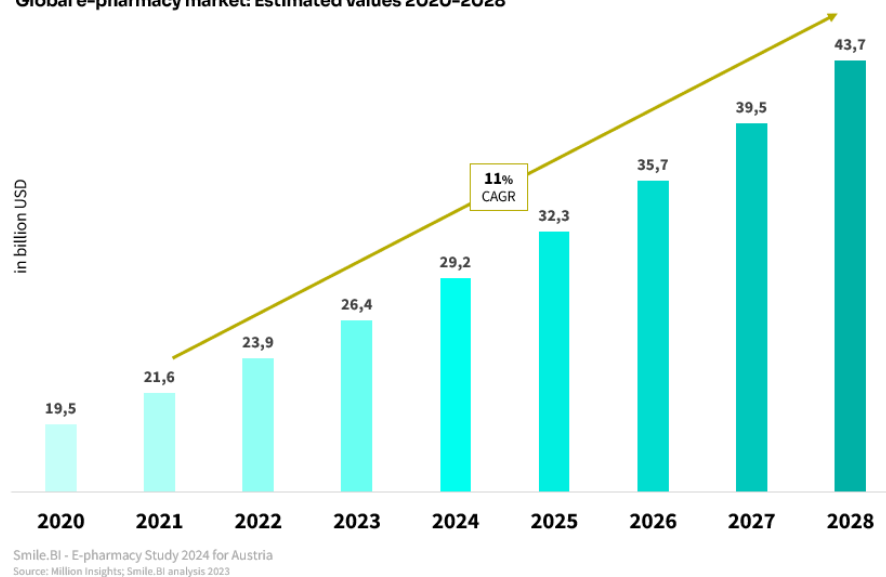
Trust and Adoption of Digital Pharmacy Services	Trust significantly moderates the adoption of digital pharmacy services. Trust in data processing and healthcare provider credibility are key factors.	Sulistyaningrum et al. (2023)
Barriers and Facilitators of Digital Pharmacy Adoption	Psychological factors such as trust, usability concerns, and privacy concerns play a major role in the adoption of digital pharmacy services.	Gong et al. (2024)
The Role of Trust in Digital Pharmacy Services	The perceived competence of the pharmacy staff is critical in building trust in digital pharmacy services.	Te Paske et al. (2023)
Behavioral and Sociocultural Barriers to Digital Adoption	Barriers to adoption include concerns over usability, technological apprehension, and a preference for face-to-face interactions, particularly in rural areas.	Sampene et al. (2024)
Demographics and Adoption Trends	Younger, digitally literate individuals are more likely to adopt digital pharmacy services. Older adults tend to show lower adoption rates due to gaps in digital literacy.	Singh & Kumar (2024)
Adoption of Digital Pharmacy Services and Influencing Behaviors	Behavioral factors like convenience, previous experience with online purchases, and telemedicine influence adoption. Barriers like usability concerns and digital apprehension hinder adoption, especially for seniors and those with low income.	Miller et al. (2024)

## 2.1 Introduction to Digital Pharmacy Services

Information technology integration in the healthcare system has had a felt impact in the pharmaceutical services as well as the opportunities offered by this change. Features such as e-prescribing, tele pharmacy, automatic medication dispensing make the use of medicines, and overall access to health so much easier. They are particularly important in decreasing health disparities in a number of ways; offering services beyond a physical environment of a pharmacy and reaching deprived or immobile patients. With the progressive implementation of digital pharmacy solutions, such factors as trust, awareness, and adoption as shown herein help enhance such services (Ezeudoka & Fan, 2024). Singh & Kumar, 2024).

### The global e-pharmacy market will double in the coming years. 65% growth for the European e-pharmacy market expected.

Global e-pharmacy market: Estimated values 2020-2028



#### Comment

- The global e-pharmacy market size was valued at USD 19.5 billion in 2020
- An annual growth rate (CAGR) of 11% from 2021 to 2028 is expected
- Market growth is expected to be driven by the digitalization of healthcare, supported by government initiatives to provide digital facilities, including e-pharmacies

Figure 2: The Digital Shift in Pharmacy: Global and European Market Trends

Source: <https://www.smileai.uk/blog/digitale-apotheken-in-oesterreich-trends-insights-und-erfolgsstrategien-fuer-2024>

As shown in figure 2, the global market for online pharmacies has the market worth USD 19.5 billion in 2020 that is expected to reach at a compound annual growth rate (CAGR) of 11% in 2028. There is also steady growth in the Asian market, especially increasing at a rate of 65 percent over the European market. In Europe, the UK currently leads the way,

with turnover of €1,475 million from predominantly female and mobile, 25 to 54-year-olds. These trends reveal increasing trend in the online buy of pharmaceuticals and retailing and the roles of demographic targeting in e-pharmacy business (E-Pharmacy, 2025).

Yet, digital pharmacy services are not fully utilized because some of them include literacy level, privacy or concern with it and technology perception. Using the DTP framework, this study addresses the following dimensions of trust: Perceived control comprises of trust in ability, trust in interface, trust in information quality, trust in website and trust in impression. This is due to the fact that there are concerns such as security in the handling of the data and information, protection of the information, reliability of the services that have been a major thorn in the advancement of this trend. From the conducted studies, it is evident that when the d-pharmacy services and operations come to the open of handling the consumer's data, most customers are willing to engage with them and assume that the safety of their data with the service providers is secure. Also, the degree of convenience and perceived utility in such services also affects the level of trust in such services or products and hence the rate of uptake (Saraswat & Singh, 2025). This appears to demotivate the older patients as well as the patients who do not often OSCE with new technologies since they do not know about the services available and their usefulness (Sulistyaningrum et al., 2023).

One other factor that determine the adoption of the digital pharmacy is the digital literacy. This indicates that the ability to perform better when using the digital technologies in the e-pharmacies can be made easier by the boosted level of the digital literacy of the users. However, those users who are not so good in internet and computer, especially elderly persons and illiterates may face some challenges and this sucks their interest of using these services (Singh & Kumar, 2024). The use of digital pharmacy services in e-health services depends on many factors on the part of the consumer including on the health information technology, usage of digital technology on online health platforms, and others. That is, provision and utilization of these services may be made easier if the general understanding of their usefulness is higher.

## 2.2 Factors Influencing Awareness of Digital Pharmacy Services

The awareness that pertains to the various services that can be offered in a pharmacy might be influenced by health literacy, convenience and the extent to which a person may have been exposed to various digital services. Another is the level of education because those who have higher health literacy, know and are willing to engage with digital pharmacy services. Persons will come to embrace digital pharmacy because of the observed benefits such as convenience, accessibility and costs (Singh and Kumar, 2024). Other factors that affect the adoption of the digital platforms are the ease of use and perceived usefulness whereby the GE Marketplace users would be willing to use a service that they find easy to manoeuvre and which would in turn benefit him/her (admin IAES2, 2024).

These factors also affect awareness levels and to some extent its usage in the different age groups show that the young people knew about the resources or it higher use. The research also depicts that e-pharmacies usage is prominent in the population of the 18–34 years' age group while persons 65 years and above are less aware and use e-pharmacies (E-pharmacy global market, 2025). It also means that overall digital familiarity, accessibility to technology, and to the platforms is needed for the older generation and they could become an audience for potential marketing and educative messages.

In addition to that, telehealth consultations and laboratory assessment services, integrated products, will provide awareness, as well as demand. This is because when they are bundled together, consumer gets much better proposition in terms of utilizing the digital pharmacy solutions that underpins them (Singh and Kumar, 2024). They also become an effective method of increasing awareness since people will opt to use services recommended by others or personalities (Clarivate, 2021).

Additional to that, access to the integrated services including telehealth consultations and laboratory assessments will ensure increased awareness and demand. This is because when they are sold together, they afford consumer much better proposition when it comes to use of digital pharmacy solutions that strengthens them (Singh and Kumar, 2024). Word of mouth also act as another way of increasing awareness because people are more likely to use services endorsed by others or celebrities (Clarivate, 2021).

### **2.3 Trust in Digital Pharmacy**

The Supposed credibility is an assumption that when people see that a certain facility, in this case the digital pharmacy services, as credible, they will access it extensively. Some works state that there are different factors that influence consumer trust. The following are some of the factors that have been observed by scholars in thalamus with regards to the proffered characterization of buyer trust. The first one is the segment of security and privacy of data which is used in the research. This is due to conformity to their privacy when seeking medical services especially with regards to their health information while under the pharmacy on line platforms. In its turn, Ezeudoka and Fan (2024) mention that there is a need to strengthen the protection from hacking of the patients' data that can cause severe consequences for the users and the suppliers of services. Trust can also be extended by companies to showcase that the consumer's privacy is well protected and also to provide the consumer an update on the security of the service (Sulistyaningrum et al., 2023). Further, being aware of processes that relate to personal information prevents the feeling of insecurity of organized services.

Another component is the stability and simplicity of service, especially having to do with prices. This means that consumers will maximize use of the digital pharmacy if the providersullfills the requirements on method of operation from the transaction and the supply of medications. Singh and Kumar (2024) stated, thus, it is necessary to state the service operation frequently and openly for improving the distrust from the users of this online pharmacy. Delivery of medication is another area where user needs to be served reliably so that users can be provided with medication without a hitch.

## Online Pharmacy Search Trends

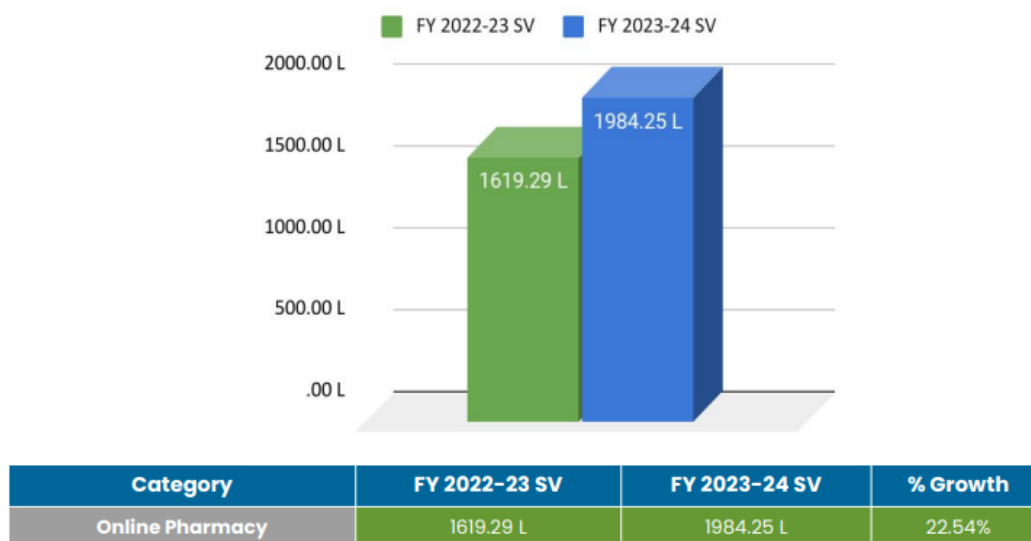


Figure 3: Online Pharmacy Industry Current Landscape and Search Trends in 2024

Source: <https://www.techmagnate.com/blog/india-online-pharmacy-trends/>

In this figure 3, reveals the current and future position of the global online pharmacy market, which is approximately valued at \$70 billion in 2023. These include increased incidences of chronic diseases, a growing world population especially geriatric population, and need for affordable medical solutions. He transforming role of the sector is also seen by the rise of digital use and search demand. The information shows the industry's possibility for growth in the long term until 2030. Market sizes 2024-2030 Report, online pharmacy, Grand View Research: 2023. Namely, Vasavada et al. (2022) enriched the understanding of users' perception of digital pharmacy platform trust comprising perceived ease of use and perceived usefulness.

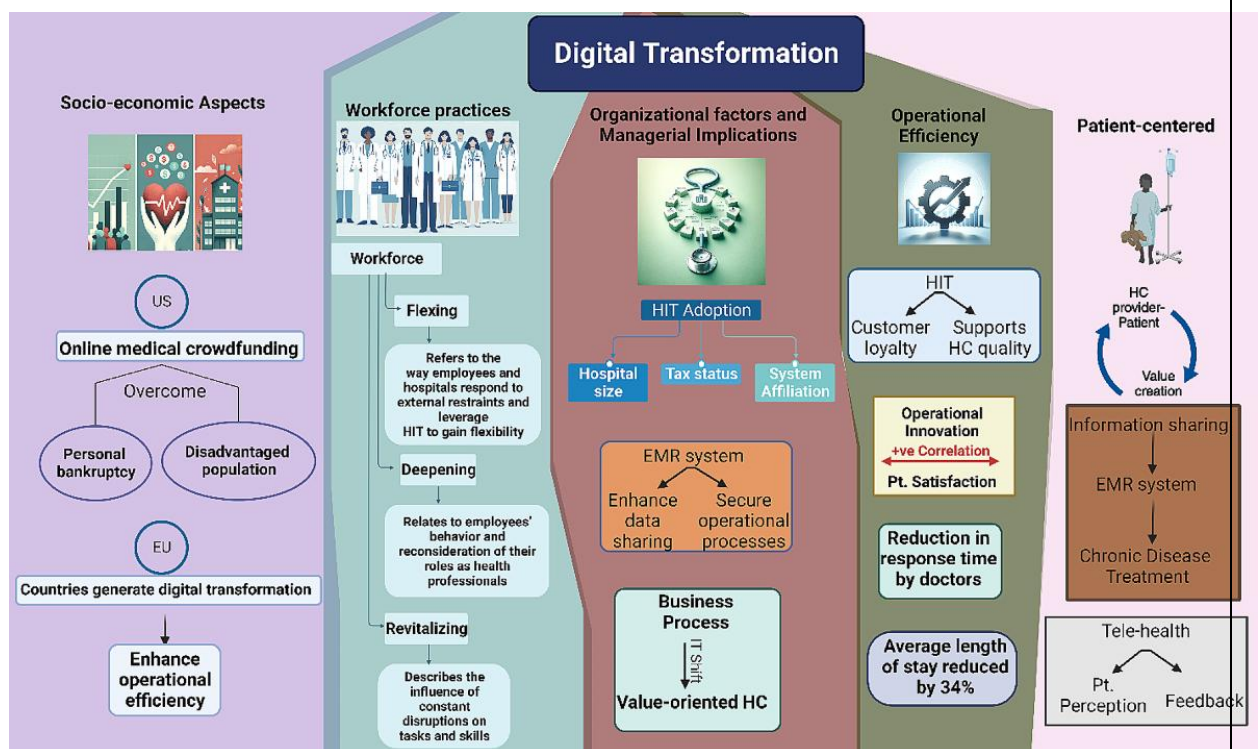
According to Saraswat and Singh (2025), when users find the interface familiar and the service useful, they will build trust and make the service popular. Singh and Kumar (2024) argue that it is hard to say no to easy to design platforms, and 24 hours availability, low cost linking with customers.

### 2.4 The Role of Digital Literacy and Education in Technology Adoption

A part of the role which influences awareness and use of technology based pharmacy services is digital as well as education literacy. With technological competence defined

as the use of technology-mediated tools, the way users adopt digital pharmacy services is as follows. Regarding the convenience of the digital services, the author notes that, when there is a high level of digital literacy, there will lead to subsequent use of the digital services and contribute to the reliability of the perception by the user (p 454). For instance, mastery of interface complexity and understanding of the mechanics of the purchase transitions users with excellent digital literacy to be more inclined towards the online pharmacists. On the other hand, the disadvantages include; this group of people often has issues of tutorial which may lock them out from using e-pharmacies due to low digital skills (Saraswat and Singh, 2025).

In his systematic literature review of articles on digital transformation in healthcare published between 1973 and 2018, Marques and Ferreira (2020) According to the SMARTER criteria, it is proposed to include 53 articles out of 749 articles retrieved in the search. The publications identified were categorized into the following seven themes: Information Technology Management in Health Care; Information Technology in the Management of Health Care; Medical Images; EMRs; IT-Portable Instruments; E-Health; Telemedicine; & Medical Data privacy. The review indicated there is considerably more focus on the integrated IT management, EMR and medical images with relatively; The recent trends include portable devices, virtual services, and a growing concern of privacy in digital health care as illustrated in the below figure 3-



*Figure 4 : Digital Transformation in Healthcare: The Role of Education in Adoption of Digital Pharmacy Services*

*Source: (Almeman, 2024)*

To elaborate on the findings on the effect of education on the perception and uptake of digital pharmacy services, this figure 4 is relevant. Research also indicates that consumers with formal education generally accept advanced technologies in digital health care hence making a positive viewpoint towards embracing technologies. Education of new adopters and simple, universally accessible platforms also beget confidence, especially in the predominantly young demographic of Bitcorn customers. At the same time, low literacy, numeracy, and digital literacy levels, especially among elderly users, suggest that they remain unaware of or cannot take advantage of these technologies, thus exposing the digital gap (Singh & Kumar, 2024). Also, it caters for education through the use of, it contributes to enhancement of confidence among people concerning use of the pharmacy digital platforms hence increasing overall confidence and use. However, a small level of education leads to a low level of awareness of the population towards the technology adoption leads to rejection of the digital pharmacy services. This knowledge gap is still more apparent from the aging groups of people who may not have used modern day ICT gadgets (Saraswat and Singh, 2025).

Therefore, the introduction of technology knowledge and education in health promotion in health and awareness may assist people in eradicating this split and enhance the use of technologies required. Some people may actually feed that such programs can help many people, particularly the low literacy or elderly people; to access the digital pharmacy services. In this way, professionals can handle problems related to technology that lead to consumers turning away from digital health services. as such, leading to higher level of confidence in this kind of services (Sulistyaningrum et al., 2023).

## **2.5 Demographic Trends and Their Impact on Digital Pharmacy Adoption**

This research shows that there is a large disparity when it comes to the usage of digital pharmacy services and this is influenced by demography, age, education on technology, and overall knowledge in technology. However, access to pharmacy that happens online is only felt by the young person's especially the one between the ages of eighteen and thirty-four years because they are conversant with the online platforms E-pharmacy

global market, 2025. On the other hand, the elderly people, especially those more than 65 years old are still using this facility inadequately due to issues of digital literacy when it comes to the online networks (Sampene et al., 2024). However, there is a rising trend prevalent among seniors; It found that out of this total, 29% of them might prefer to use such services (E-pharmacy – Global Market report, 2025).

Another factor is technology education which defines the capacity and readiness of the organizations in question to embrace digital pharmacy. Only highly educated people are aware of the availability of the different digital pharmacy services hence would more likely trust the services offered by the different platforms (Singh and Kumar, 2024). Health literacy also contributes to the adoption in realization consumers with pre-existing knowledge regarding health issues will embrace and use technology solutions (Sampene et al., 2024). It is most peculiar to developed countries which have fully developed facilities and a large number of online services and where the clients in one way or another have come across e-pharmacies through the telemedicine consultations, prescription refill among others services.

## **2.6 Behavioural and Psychological Factors Affecting Digital Pharmacy Usage**

Behavioural and psychological aspects are contributing factors in shaping the advancement of digital pharmacy services. Research does have some features that influence an individual's behaviour and attitude towards such technologies. One of the critical factors is trust, which moderating variable in the adoption process (Sulistyaningrum et al., 2023). The assurance of safety and credibility of a digital pharmacy service makes the user to agree to accept the service. otherwise, concerns of privacy or improper use of personal health information will delay its uptake because of psychological factors (Ezeudoka & Fan, 2024). To eliminate such barriers, best practices to foster trust should be implemented such as privacy policy and security of the site.

Another behavioural factor is digital literacy in the sense that patient's level of digital illiteracy may influence their ability to engage online pharmacies. Higher levels of digital literacy mean that one feels at ease to interact with the services, one is capable of using technology for the interaction and in his or her perception of the ease of incorporating the technology into one's life is easy (Singh & Kumar, 2024). In contrast, it may lead to feelings of frustration or anxiety while benefitting from such services, which incline

individual behaviour against accepting the service. Age also dictates positions, young people prefer and utilize digital goods more than older aged persons due to technological illiteracy, whereby majority of the elderly over 65 years rarely use e-pharmacy services (E-pharmacy global market, 2025).

Another psychological barrier is the fulfilment of the needs for a direct meeting with the pharmacists as independent physicians. There are always customers, especially the older population, who will prefer to consult a pharmacist in person for medication counselling. The fact that these are forms of consultations that are offered digitally makes the services uncomfortable or dubious to users, which in turn creates resistance to the use of the digital platforms (Sampene et al., 2024). They include perceived usefulness, perceived ease of use.

Last, sociocultural factors like peer pressure and word of mouth affect the overall behaviours. According to word-of-mouth communication, or in other words, endorsements from socially influential people, more people opt for digital pharmacy services. However, advocacy from the negative past experience will decrease acceptability since people are more likely to view them as risky (Ezeudoka & Fan, 2024).

## **2.7 Usability Issues and Barriers to Digital Pharmacy Adoption**

Issues associated with users and accessibility remain main key impediments to the uptake of digital pharmacy solutions. One major barrier is seen and is mainly triggered by low levels of technology literacy especially among senior citizens as well as other parts of population who have no access to technology. These groups' limited technologically and limited internet access limits their ability to engage into e-pharmacy and compromise the digital divide that hinders the adoption (Sampene et al., 2024). In the poor regions, the few sources of internet access are generally inadequate thereby exacerbating the problem and limiting access to online pharmacy (Apte et al., 2024a). In addition to this complexity, some of the factors discussed above push away even the general user due to the complexity in the user-interface of the pharmacy services. This problem can be headed off in the future by making the user experience less cluttered and by providing simple instructions.

One more challenge is that digital solutions in the sphere of pharmacy are not interconnected with more traditional approaches and systems in healthcare. In the 2024

study conducted by Pharmacist, many pharmacies experience significant difficulty in trying to incorporate new information technologies into their practices. Consequently, a number of ineffectiveness, mistakes, and time wastage occur, which hinders the confidence in and quality experience with digital pharmacy services (Pharmacist, 2024). Moreover, there are some barriers such as legal issues that inhibit the smooth growth of digital pharmacy services such as variation in the laws governing the provision of digital pharmacy services which poses certain risks to digital pharmacy providers (Miller et al., 2021a). Especially, though the establishment of e-pharmacies is legal in some countries like India, the rules for the operation of e-pharmacies are still ambiguous which leads to some delays and legal issues (Apte et al., 2024b).

Other factors, including social, also contribute to the continued delayed use of these digital pharmacy services, were people like face-to-face communication. Some people hold the opinion that calling and visiting a pharmacist enables interaction, something that many people fancy especially the elderly (Sampene et al., 2024). These are in addition to the established barriers caused by issues of privacy and security. Areas such as the usage of the internet as a means of sharing health information may be hampered by concerns such as data leakage, identity theft, and many others (Tiga Health Care, 2021).

## **2.8 Sociocultural and Psychological Barriers to Digital Pharmacy Adoption**

Subsequent research papers have expounded that sociocultural and psychological factors are key to excluding considerations that exacerbate the use of digital pharmacy services. One of them is: most of the time, people with different levels of sociocultural expectations are technology literate and less technology literate. Male and aged participants above 65 years are least likely to use e-pharmacy services; this may be due to high levels of Scepticism about technology among the elderly. A sense of disconnection from everything that appears to be attempted to be done via a digital platform result from lack of familiarity within the use of digital tools, less digital competency, and a preference for face-to-face approaches (Sampene et al., 2024). Others, which also have an impact on such a situation, are cultural views regarding health care and scepticism of everything connected with technology or online services.

In this case, the described communities, often, are target communities that did not have much interaction with digital health solutions and, thus, the primary approach to getting

drugs and consulting with them being a part of the real-world “field plan.” In a psychological perspective, privacy and security are two of the most important factors influencing users’ trust and their receptiveness to digital pharmacy services. From the study, individuals remain quite hesitant to generate their health-conscious data within the web environment because they worry about cyber breaches or malicious use of data, they consider private (Ezeudoka and Fan, 2024). Worryingly, they think the digital platform offers even less privacy and personal touch services than the conventional onsite pharmacy services. Concerning security, the processing transparency rate of services and measures that are put in place to handle data have ensured user’s trust; without which, potential consumers of these services get scared (Saraswat and Singh, 2025). In addition, since low-health literates lack adequate knowledge concerning how their data is utilized and protected by others, this kind of will result to more discomfort and distrust in direction of the use of digital pharmacy by a number of clients (Singh and Kumar, 2024).

## **2.9 Privacy and Security in Digital Pharmacy Services**

A Pharmacy Digital Service can be accepted when privacy and security measures are established to create trust in the services being offered. Preserving individuals’ health data and guarding loss that impacts the patient or health care facilities is what most people expect when it comes to regarding such services (HETT Show, 2024). This makes transition to digital pharmacy services a large concern for the consumer because they are reluctant to reveal some health information over the internet without being assured of their privacy (Ezeudoka and Fan, 2024). Besides, there are fraud and identity theft risks, which contribute to the growing concerns to digital platform (Tiga healthcare, 2021).

Besides, with regard to those issues, the most important problem is the issue of the visibility of user data processing. It is especially important to be as clear as possible with regard to how data are processed, the degree and types of transaction security customers can expect, and privacy policies (Saraswat and Singh, 2025). Research has revealed that when people get a feeling that certain platform will protect their information and privacy they are likely to use digital pharmacies (admin IAES2, 2024). Other CIO tasks, such as implementing opt-in privacy measures that include real-time security information on service offerings could also have a beneficial impact on users’ perception hence the adoption levels (Low et al., 2021).

Furthermore, these services rely heavily on issues to privacy regulations and healthy cyber security. The respect for the privacy laws should be supported by the regulatory agencies and ensure that digital pharmacies adopt high level security technology (Singh and Kumar, 2024). There are also other technical shocks such as, very strict encryption, secure payment methods, and identification methods that reduce security threats to a very minimal level(Gong et al., 2024). In their absence, consumers are not ready to engage with the digital pharmacies to prevent circulating personal materials such as medical and financial.

## **2.10 Conceptual Framework**

A framework for a digital pharmacy includes the use of innovation in provision of pharmacy services through web-based prescriptions, virtual consultations, security of records, and online shopping. It addresses the principles of availability, convenience and confidentiality with the intent on enhancing medication adherence, patient knowledge as well as efficiency in service delivery; it poses with issues to do with trust, security and literacy.

### **Recommendations for Improvement:**

Return user confidence through establishing of proper measures to protect data, availing information on security to users, and training users on the same. This means it can be enhanced through proper advertisement and social media marketing with the help of health care providers. Activities should be customized according to the domains of the demographic characteristics; the trainings incorporated for the low literacy in either digital or health.

### **Barriers to Adoption:**

Lack of awareness and privacy issues, digital literacy that is naïve or incomplete, and availability issues for those in their later years or who may have health illiteracy do not always approve of digital pharmacy services.

### **Dependent Variable:**

- 1. Adoption of Digital Pharmacy Services:** In this case, defined as people's utilisation of multiple forms of digital pharmacy interfaces and services such as

electronic prescriptions, distant pharmacy, robotics pharmacy, and many more. It defines the extent and frequency of utilizing and engaging with pharmacy related technologies.

### **Independent Variables:**

#### **1. Trust in Digital Pharmacy Services:**

- Perception that people have towards the services offered by digital pharmacies, in questions like – to what extent are people comfortable with relevant digital services – concerns over data privacy and security, reliability, and integrity of services provided by these platforms. This study showed that consumer readiness to adopt digital pharmacy services depends on trust. They are prior experiences, perceived transparency of service providers and perceived competence of pharmacists.

#### **2. Awareness of Digital Pharmacy Services:**

- It also measures the level of awareness of people to the available electronic pharmacy services. Which are exposure to the various digital technologies, education, digital literacy, and exposure to the digital health care platforms. Thus, the higher the awareness, the higher are the chances of utilizing digital pharmacy services in a certain activity.

#### **3. Demographic Factors (Age, Digital Literacy, Health Literacy):**

- These are distributions of demographic characteristics in age, digital literacy and health literacy affecting perceptions and digital pharmacy services use. The current trends indicate that, younger self-service, digital proficient, and health literate clients would seek the digital pharmacy services more. The acceptability of technology varies based on the composition of the different assemblies of people in the pharmacy domain, as captured by this variable.

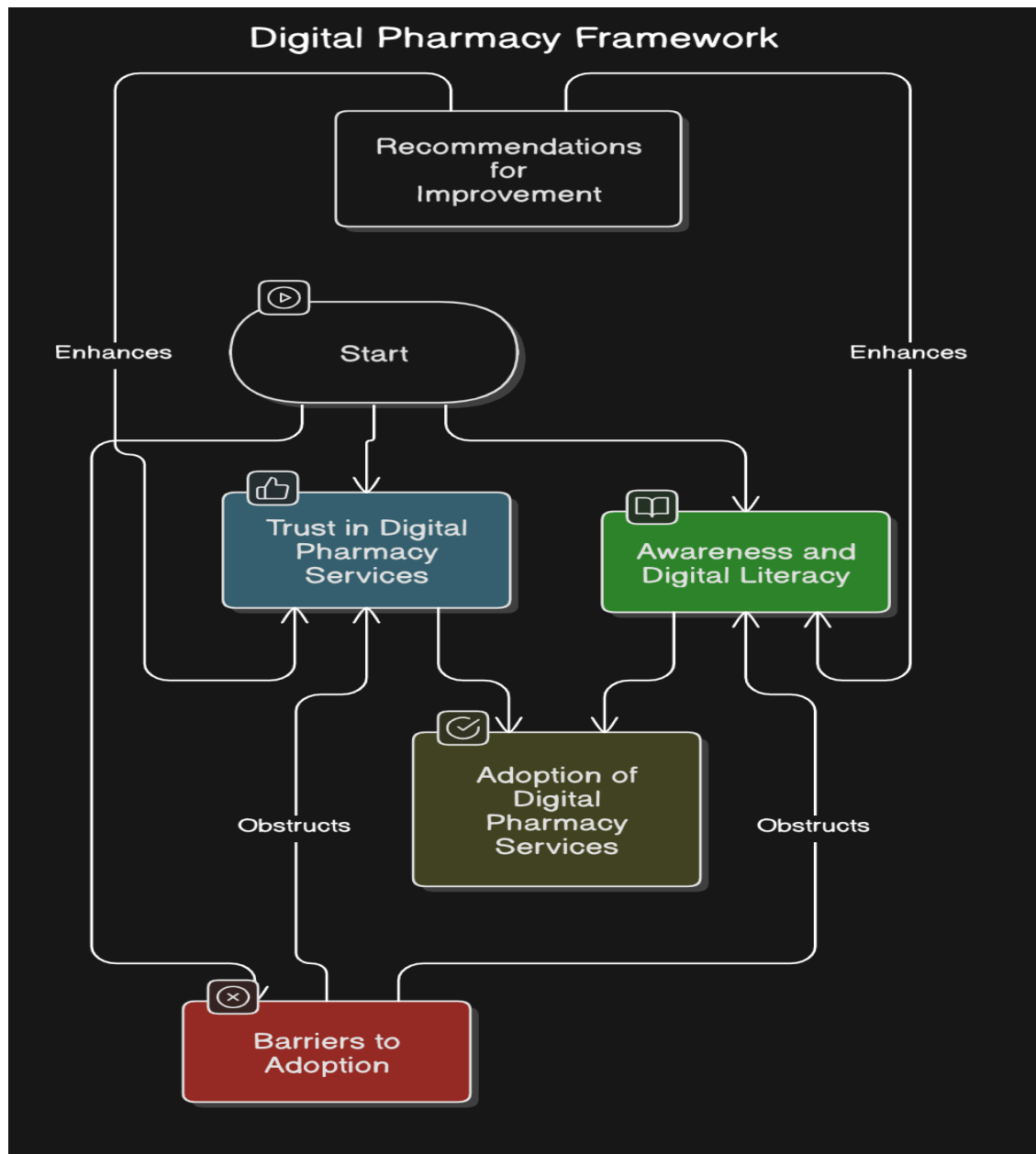


Figure 5: Digital Pharmacy Framework: Factors Influencing the Adoption of Digital Pharmacy Services.

Source: Own Create

This figure 5 sums up the analysis of key factors influencing the implementation of digital pharmacy services. The dependent variable, adoption of digital pharmacy services, captures the real embrace of technologies such as e-prescription, tele-pharmacy, and robotic systems. Based on the framework, three independent variables are postulated as critical in the study: (1) Trust in Digital Pharmacy Services, encompassing concerns about data security, reliability, and provider competence; They identified the following factors:

(1) confidence in DS, including matters of data protection, certainty in the information, and the pharmacist or electronic service supplier; (2) knowledge about DS, influenced by previous knowledge, digital literacy and prior experience with eHealth services; and (3) demographic characteristics such as age, health literacy, and level of digital experience. These aspects combine in a way that affects the ability of the users to embrace digital pharmacy solutions.

### **2.11 Limitations**

The current literature offers only a very small number of articles on the subject of digital pharmacy services. One of the largest challenges is a shortage of studies in population samples from the following categories: older adults and underrepresented groups, who still have limited access and/or training with technology. Besides market factors, which have all been analysed, trust factors encompass privacy, security, and reliability of services. However, there has not been enough emphasis on how trust can be affected by the real-time update and the continuous update of services. There is a great deal of literature on concerning individual regions, which makes the research results slightly generalizable, especially in developing countries. However, some broader and longitudinal investigations are necessary to determine the impact of digital pharmacy on patients and healthcare system effectiveness over the long term. Interoperability and regulatory concerns related to digital pharmacies and the conventional healthcare systems are still an area that requires a much more extensive study since this is another worrying side of integration issues.

### **2.12 Theoretical Framework**

The Technology Acceptance Model (TAM) which is an understandable and predictable theoretical model, is well known in examining the attitude and intention toward new technological systems. It posits that perceived organisational support for use, perceived ease of use, and perceived usefulness are the major components of technology acceptance. The constructs are specifically significant in determining how people assign their responses to the use of e-pharmacy platforms for delivery of digital pharmacy services (Sulistyaningrum et al., 2023).

Perceived Usefulness (PU) on the other hand deals with how useful a particular technology is to the user or how the use of this technology will enhance his/her

performance or enhance his/her convenience. In general, one can possibly relate this to all forms of digital pharmacy service with how can to get medications online is convenient, flexible, a one-stop source and efficient on working days (Singh and Kumar, 2024). Current studies prove that users find digital pharmacies helpful when it comes to prescription, refill and consultation. hence it is expected that they are related with these services (Ezeudoka and Fan, 2024). For instance, generational cohort consumers who are inclined toward online shopping and electronic platforms would consider e-pharmacies advantageous and convenient (Sampene et al., 2024). The previous known variables are use, accessibility, satisfaction and other factors like low cost, discounts, bundled services, telehealth consultations that come under perceived usefulness (Clarivate, 2024).

Perceived Ease of Use (PEOU) is defined as the perceived amount of effort to use a technology. In the case of digital pharmacy services, the cloth must be user-friendly and the actual transaction must be accurate. Easy and user-friendly platforms will translate to users handing over their trust to adopt its technologies (Saraswat and Singh, 2025). Lack of complex procedures of registration or ordering also increases the number of users satisfied, thus using it repeatedly; (Singh and Kumar, 2024). On the other hand if the platform is complicated and is likely to have frequent errors then it reduces the level of trust and deter the usage especially in elderly or those with lower IT literacy level (Apte et al., 2024b).

The other aspect that has been included in TAM in regarding to digital pharmacy is trust. A number of investigated factors include how secure the data is, the privacy accorded, and the reliability of the services provided by the digital pharmacy system (Sulistyaningrum et al., 2023). Thus, even though pilfering is prevented in the use of technological devices, a lack of assurance of users that that their personal and health details are safeguarded also reduces their willingness to pursue digital pharmacy services. Furthermore, it also enhances the user have confidence or trust on the system with respect to the ways data assets are managed and updated; real-time security disclosures; and other facets of the service provider (idem, 2025).

### **2.13 Literature Gap**

The existing literature on digital pharmacy services covers important issues pertaining to their uptake, trust, and familiarity. however, several gaps exist. As earlier discussed, trust

is said to be contingent on elements such as data security and privacy as well as transparency (Ezeudoka & Fan, 2024; As highlighted in Low et al. (2021), there is scant literature on how trust and adoption differ within generations or how specific groups, such as the elderly, are affected. In the same regard, despite the fact that ease of use and utility are considered as the constructs that might significantly affect the development of trust (Saraswat & Singh, 2025), there is a lack of studies on the influence of the real-time security updates as the key construct shaping trust created by users of digital pharmacy (Sulistyaningrum et al., 2023). Aside from the age and health literacy variables outlined above (Singh and Kumar, 2024), relatively little is said about the behavioural factors, particularly how their daily use pattern: like online shopping – embraces the use of digital pharmacy services. Besides emergent risks with it, there is limited comprehension of the factors; psychological and sociocultural, which keeps the older adults from adopting and utilizing digital pharmacies (Apte et al., 2024a). In addition, a great deal has been written about the rules and structures for the trouble of e-pharmacies (Cowper, 2024) but relatively little about how those gaps between countries-India being an example (Apte et al., 2024) depress adoption. If these gaps are closed, there is potential for new solutions to be identified to overcome the challenges faced and in improving the integration of digital pharmacy services.

#### **2.14 Conclusion**

Several changes have been realised due to digital transformation in pharmacy services, despite this, adoption has not been completely smooth. According to Ezeudoka and Fan (2024), trust, awareness and demography must be taken into consideration when it comes to adoption of such services. Sulistyaningrum et al., 2023). Disquiet around acceptance pertains to data privacy and security of health-sensitive information (Saraswat and Singh, 2025). Additionally, a flow of digital literacy-smashing hands with the elder generation-reduces the potential for acceptance on a larger level (Sampene et al., 2024). Previous studies have highlighted transparency and perceived ease of use as elements increasing trust; however, these relationships should be tested across generations as well (Low et al., 2021). In addition, on-ground implementation of the digital pharmacy into the already existing hierarchical type of the healthcare order has not been an easy task and other main concerns are legal aspects, connectivity and entry to hard-to-reach areas (Apte et al., 2024a; Cowper, 2024). Despite the increasing usage of e-pharmacy services, shortcoming like lack of internet services, high initial costs, and security issues act as hindrances to

adoption and expansion. As a result, to fill these gaps, future studies should focus on addressing the aforementioned factors through evolving potentially workable policy measures specifically for specific users (Gong *et al.*, 2024; Soderlund, 2023).

### **3 CHAPTER 3: METHODOLOGY**

#### **3.1 Methodology Overview**

This study aims to explore the factors influencing the adoption of digital pharmacy services, focusing on three main objectives. The first objective is to explore how factors such as digital literacy, exposure to technology, age, and health literacy affect individuals' awareness of digital pharmacy services. Awareness is a critical factor in the adoption of digital pharmacy services as it determines whether individuals are informed about their availability and potential benefits. The second objective examines the role of trust in the adoption process. Trust, which encompasses perceptions of data security, privacy, transparency, and the reliability of service providers, is essential in motivating individuals to embrace digital health solutions. Finally, the third objective aims to identify barriers and facilitators influencing the adoption of digital pharmacy services. It will explore demographic, behavioural, and technological factors that act as either obstacles or enablers, particularly focusing on the unique needs of vulnerable groups such as older adults, low-income individuals, and those with limited digital or health literacy. The findings from this study will contribute to a deeper understanding of the factors that drive or inhibit the use of digital pharmacy services, providing valuable insights for practitioners, policymakers, and service providers.

#### **3.2 Methodological Difficulties**

In Some of the challenges that occurred in the course of this research include: However, it was quite challenging to get an appropriate and proportional sample size. Several methods act as a limitation in the present study: Convenience sampling technique used in the study may not represent a true picture of the actual population. This could reduce generalizability for the wider society, particularly they will only be applicable for a certain age, digital skills, and socioeconomic status. Another methodological problem that was evidenced was the difficulty of using the online survey, particularly the sample bias in recruiting older adults or anyone with limited internet accessibility. Consequently, participants' awareness of digital privacy and technology could have skewed their responses at varying extents. It also meant that participants' experiences with digital pharmacies could differ significantly depending on when or from which source they engaged with it, which made it challenging to arrive at a fixed state. Nevertheless, we appreciated these as limitations within the complexity of the proposed research design

that sought to address them through appropriately crafted questions, multiple recruitment strategies, and the targeting of a diverse sample of adults with all levels of computer literacy.

### **3.3 Target Population**

The target population for this research is composed of adults, 25 to 60 years old, who in one way or another, use the services of a pharmacy either a physical visit or remote access. Special emphasis is paid to respondents from the working population since it can be expected that their awareness of technologies and digital pharmacy services differs. The aim of the study is to uncover demographic determinants of these perceptions, including age, health literacy, and digital literacy. With this target population, the research effort seeks to establish factors influencing the adoption of digital pharmacy among the working adults.

### **3.4 Participant Selection**

The targeted auditioned shall be procured from the rapid convenience sampling technique since this form of sampling is able to recruit samples from diverse population space. The participants will be reached through an online questionnaire which will be shared through e-mail, WhatsApp and through advertisements on social media, specifically Instagram. In targeting this population, the sample is deliberately drawn from a cross-section of professionals with different levels of computer literacy to give an assurance of the representativeness of the target population. Although convenience sampling creates a bias in selecting subjects, it has to be the most realistic approach experienced in the course of the study, given the sheer number of diverse subjects and the time at the disposal of the researcher.

### **3.5 Sample Size**

The research survey requires 143 respondents in its total sample population. A sample of 143 participants offers both statistical significance and the best conditions for running analysis through SPSS software to study the target population. This sample size possesses enough data points to locate significant patterns between variables and remains tractable for evaluative purposes. This researcher-selected range allows researchers to examine adoption factors effectively while keeping investigation costs reasonable according to

Saunders et al. (2015). The selected sample size will supply a strong foundation for understanding how trust combined with awareness and digital literacy affects digital pharmacy service adoption.

### **3.6 Research Design**

This investigation uses descriptive research design as its quantitative research approach. This descriptive research method suits investigations intent on documenting population and phenomenon characteristics including digital pharmacy service adoption elements. The survey allows researchers to measure relationships between different variables including trust levels and awareness factors along with population demographics which affect digital pharmacy service adoption rates. A descriptive design enables the collection of broad-scale observational data about participants' encounters and beliefs without any environmental changes. The survey design successfully monitors what people currently know and practice about digital pharmacy services across different population segments to reveal critical uptake factors enabling evidence-based improvements.

### **3.7 Research Approach**

This research explores digital pharmacy service adoption by utilizing a quantitative method that quantifies connections among various elements including trust and awareness and digital literacy. This study needs quantitative research to gather numerical data systematically for statistical testing of hypothesis while detecting patterns. Research from Creswell (1998) and Johnson & Christensen (2004) establishes quantitative methods generate consistent reproducible findings which expose variable connections clearly. The researcher can achieve both descriptive and inferential analysis through the SPSS statistical tool to study connections between data and demographic-specific trends and distinct patterns.

### **3.8 Research Strategy and Philosophy**

A descriptive research approach guides this study as investigators work to document observations about user experiences and opinions regarding digital pharmacy delivery. Under positivist research framework the study establishes that reality exists objectively and quantitative data serves to measure it. .proto methods empirical investigation to analyse statistical patterns that reveal the relationships between studied variables. Hanson

et al. (2005) established that research focusing on pattern identification and practice/policy-related insights benefits from the positivist research approach. This investigation analyses the elements shaping trust and awareness together with adoption through descriptive statistics while employing Pearson's correlation and ANOVA and regression analysis for hypothesis testing and variable correlation examination.

### **3.9 Data Collection**

An online survey distributed through Google Forms functions as the data collection method for this study. The approach provides quick and affordable results together with the capability to obtain information from many participants. Multiple closed-ended questions will form the survey to obtain demographic data about participants (age, educational level, digital fluency) coupled with research-focused issues (digital pharmacy service perception and trust levels and acceptance rates). This research utilizes a 5-point Likert scale across survey questions to understand participant reactions toward digital pharmacy service statements. Using this method researchers can objectively measure survey participants' reaction to questions and statements through numerical values. Multiple platforms including email and WhatsApp along with social media advertisement will enable the survey's distribution to reach participants from different professional backgrounds who have diverse levels of digital literacy.

### **3.10 Data Analysis**

All analysis using SPSS software to process the gathered data. The study begins by using descriptive statistics to generate summaries regarding participant demographic information and survey answer patterns. The dataset will be condensed using mean scores together with frequencies and standard deviations. A Pearson's correlation analysis will follow to evaluate relationships that exist between trust, awareness, digital literacy and the dependent measure of digital pharmacy services adoption. The study utilizes ANOVA together with regression analysis to determine response variation across different demographic groups including age and health literacy levels. This analysis uses statistical methods to detect which elements generate meaningful effects on the adoption rate of digital pharmacy services.

### **3.11 Materials**

The research instrument for data collection consists of an online survey developed through Google Forms. This research uses a 5-point Likert scale survey with 15 closed-ended questions to explore digital pharmacy service adoption across three main areas. The survey includes five demographic questions to collect data about participants' age levels, academic backgrounds, digital competency, and ownership of technological devices. Google Forms facilitates both quick data acquisition and straightforward navigation as well as automatic data export capability for analysis purposes.

### **3.12 Questionnaire Structure**

The questionnaire exists to evaluate the public comprehension of digital pharmacy methodologies as well as their reliance on and use of these platforms particularly through an age-based analysis. The survey asks demographic questions at first to identify vital participant attributes such as age gender education level digital literacy and internet access. The collected questions establish the essential background needed to analyse how demographic variables shape participants' reaction to digital pharmacy solutions. Following demographics comes a set of Likert scale questions grouped by three main objectives within the survey. The first target area assesses participant knowledge regarding digital pharmacy services together with their familiarity with e-prescriptions and tele pharmacy and their comfort levels using these modern drugstore technologies. The second objective of the study analyses how participants perceive digital pharmacy service providers' adherence to data security and transparency while examining their trust in the accuracy of digital pharmacological offerings. The survey investigates the future implementation of digital pharmacy services through an analysis of convenience features and healthcare provider linkages together with preference patterns for online patient consultations and medication service delivery. Participants express their views clearly through a Likert scale which moves from "Strongly Disagree" to "Strongly Agree." The collected survey data allows researchers to discover which components most impact daily healthcare acceptance of digital pharmacy services along with how different population segments confront challenges or find opportunities for adoption.

### 3.13 Research Limitations

The study acknowledges several limitations. The selection process of convenience sampling creates biased sampling because it does not sufficiently demonstrate the diversity of the overall population who lack internet access or digital literacy skills. Among the study's limitations the use of self-reported data creates the potential for participants to select socially desirable responses over genuine opinions. The study's cross-sectional research structure fails to show how participant attitudes and behaviours transform during different periods of time. The study has limitations in representing psychosocial digital pharmacy adoption factors since it does not address personal experiences and cultural differences affecting the general validity of results.

### 3.14 Conclusion

A systematic investigation into digital pharmacy service adoption drivers and barriers was conducted through the methods described in this chapter. Analysing reliable data through a quantitative approach and descriptive research strategy enables researchers to uncover significant statistical trends along with relationships. The research team utilizes SPSS software together with an online survey to collect data that reveals factors supporting or blocking digital pharmacy service adoption. The design displays enough strength to target main research questions and upcoming studies should leverage these results for a fuller grasp of digital pharmacy adoption influences

*Table 2: Hypothesis Table*

Independent Variable	Dependent Variable	Hypothesis
<b>Trust in Digital Pharmacies</b>	Adoption of Digital Pharmacies	Higher trust in digital pharmacies positively impacts adoption rates.
<b>Awareness of Digital Pharmacies</b>	Adoption of Digital Pharmacies	Greater awareness of digital pharmacy services correlates with increased adoption.
<b>Age</b>	Adoption of Digital Pharmacies	Younger adults are more likely to adopt digital pharmacy services than older adults.

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<b>Digital Literacy</b>	Adoption of Digital Pharmacies	Higher digital literacy leads to higher adoption rates of digital pharmacy services.
<b>Health Literacy</b>	Adoption of Digital Pharmacies	Higher health literacy leads to higher adoption rates of digital pharmacy services.

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#### **4 CHAPTER 4: Finding and Analysis**

The results chapter of this quantitative research presents findings based on data collected from 143 participants, focusing on the factors influencing the adoption of digital pharmacy services among adults. This study evaluated both trust levels and awareness along with digital and health literacy alongside age-related demographic data. A diverse group of participants with various age ranges and educational levels and levels of digital competence participated in this assessment to allow research analysis across societal demographics. The research findings showed that rate of adoption was driven by how much people trusted digital pharmaceutical services and knew about them. Users who demonstrated better knowledge concerning e-prescriptions and online consultations along with medication delivery demonstrated higher service adoption rates. The data showed that participants with superior exposure to digital platforms demonstrated improved understanding about the different digital pharmacy services available in the market.

Trust proved to be the essential element that determined adoption rates. Users who felt secure about data privacy as well as platform security and trusted the services' authenticity showed higher adoption rates for digital pharmaceutical services. Users developed trust based on their perception of reliability and visual overview of the service provider's professional credentials. Study results demonstrated that users rely fundamentally on perceived ease of use together with perceived usefulness as described in the Technology Acceptance Model (TAM). Easy-to-use digital platforms which presented clear benefits like convenience and cost-effectiveness and time-efficiency led to higher participant engagement especially among tech-savvy users under 35 years old.

Results showed that both participant age and digital knowledge level established themselves as key determinants for adoption statistics. Young people between 18 and 35 years old displayed the biggest interest in adoption but senior citizens over 55 years old maintained their resistance citing both technical incompetence and security anxieties alongside traditional personal interaction preferences. Participants who demonstrated stronger health-related understanding and literacy demonstrated higher confidence in digital pharmacy usage which shows that health knowledge enhances user adoption of tech-based healthcare solutions.

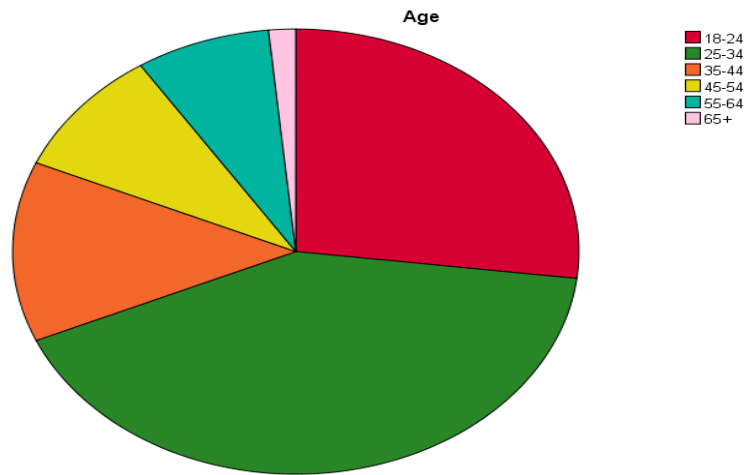
Survey results revealed that the main difficulties preventing adoption consisted of inadequate information distribution and security concerns with privacy risks and restricted online access and complex system layouts. The challenges affected older adults and people from lower-income backgrounds in disproportionately high numbers. Positive engagements with digital healthcare and educational programs and supportive family networks helped hesitant users become more open to technology-based health service adoption.

#### **4.1 Demographic Questions**

The survey conducted for this study on the adoption of digital pharmacy services gathered 143 responses, offering valuable insights into the demographic and behavioural variables that influence individuals' engagement with technology-driven healthcare. Digital pharmacy adoption assessment data involved four key indicators which examined participant demographics as well as educational and digital knowledge levels and online connection capabilities.

##### **4.1.1 Age Distribution**

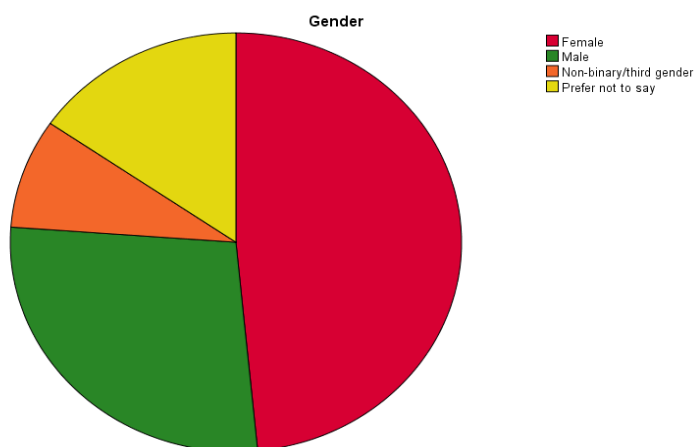
The largest portion of respondents fell within the 25–34 age group, accounting for 37.8% (54 individuals). People aged 18–24 represented the second largest group at 24.5% (35 people) according to survey results. The majority of study participants who made up nearly 60% of the total group belong to younger generations which supports previous research showing digital aptitude increases by age. Senior age demographics showed a substantial decrease in participation so the participation rates dropped to only 1.4% for those aged 65 and above and 7.0% for those between 55 and 64 years. The survey sample included 1.4% of people aged 65 or above alongside 7.0% of participants who belonged to the 55–64-year age group. The steep decline in participation demonstrates a digital gap because senior citizens show minimal interest in using online pharmacy services or lack awareness of them. The statistical evidence shows that older adult populations need targeted awareness initiatives along with digital literacy programs to achieve equitable healthcare innovation access.



*Figure 6: Age Distribution*

#### 4.1.2 Gender Representation

In terms of gender, females represented the largest proportion of the sample at 44.1%, followed by males at 25.2%. Notably, 7.7% identified as non-binary/third gender, and 14.0% preferred not to disclose their gender, suggesting a commendable level of inclusivity in the survey design. Personnel technological adoption behavior relates to gender differences which stem from preference choices and comfort levels in private healthcare environments combined with risk perception metrics. The balanced gender distribution permits researchers to analyze meaningful differences between genders concerning trust and awareness.



*Figure 7: Gender Representation*

### 4.1.3 Educational Background

Educational qualifications among the respondents were relatively diverse. The largest group held a master's degree (23.1%), followed closely by those with a bachelor's degree (22.4%) and some college or associate degree (18.2%). A population with lower educational attainment made up 14.0% of participants. The analysis of awareness and digital literacy depends heavily on this specific educational range. People with higher education backgrounds demonstrate better adoption of health technology along with superior research skills and better digital system comprehension. The occurrence of participants with basic education leaves us with a responsibility to create accessible digital pharmacy systems for all user types beyond people with superior educational backgrounds.

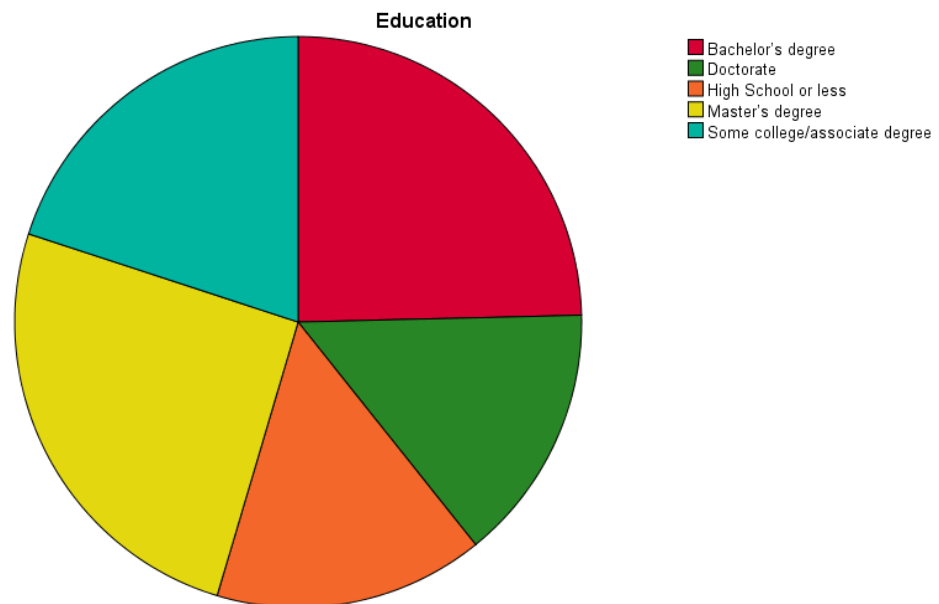
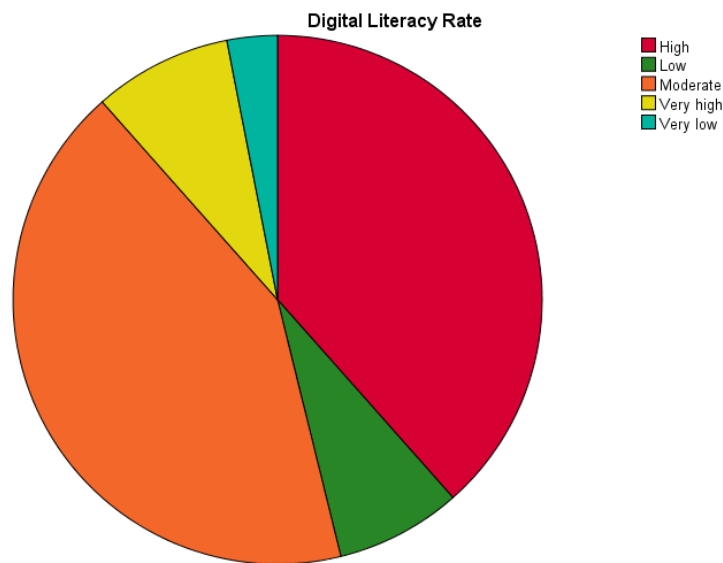


Figure 8: Educational backgrounds.

### 4.1.4 Digital Literacy Rate

A significant portion of the participants reported a moderate (38.5%) or high (35.0%) digital literacy level, while only 2.8% indicated very low digital literacy. The results indicate a possible technical expertise bias in the test group because of their high skill

level with technology likely increasing measured adoption rates. The 7.0% of participants who demonstrated low literacy combined with those who reported very low literacy shows a compelling reason to develop user-friendly systems along with digital literacy support programs when aiming for digital adoption throughout society. The 7.7% who considered themselves “very high” in digital literacy may function as both advocates and testers of new systems.



*Figure 9: digital literacy*

#### **4.1.5 Internet Access**

The overwhelming majority (88.8%) reported having internet access, a foundational requirement for accessing any digital pharmacy service. The small group without internet access (2.1%) creates an actual obstacle for digital pharmacy access despite their low numbers. People who lack internet access should be considered fully excluded from modern digital pharmacy services since it indicates broader infrastructure problems policymakers must resolve in underserved and rural areas.

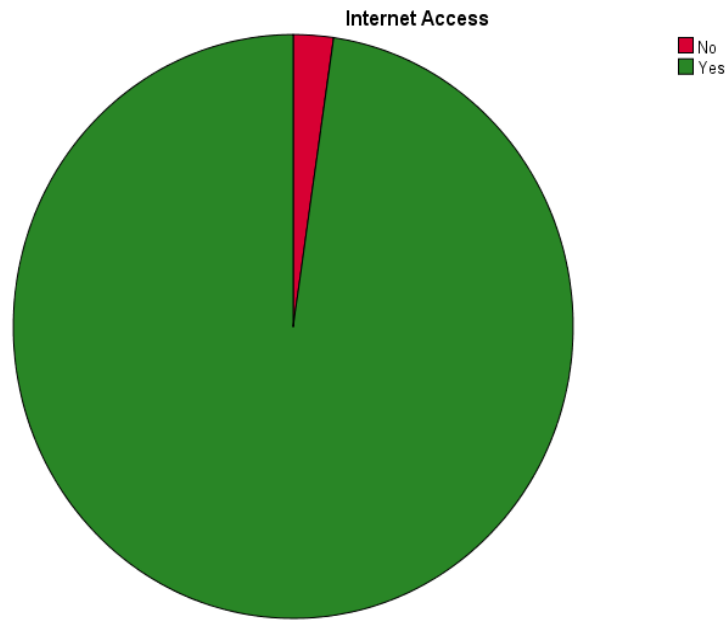


Figure 10: internet access

Table 3: Demographic Profile of Respondents (N = 143)

Variable	Category	Frequency	Percent (%)	Valid Percent (%)	Cumulative Percent (%)
<b>Age</b>	Under 18	13	9.1	9.1	9.1
	18–24	35	24.5	24.5	33.6
	25–34	54	37.8	37.8	71.3
	35–44	17	11.9	11.9	83.2
	45–54	12	8.4	8.4	91.6
	55–64	10	7.0	7.0	98.6
	65+	2	1.4	1.4	100.0
<b>Gender</b>	Under 18	13	9.1	9.1	9.1
	Female	63	44.1	44.1	53.1
	Male	36	25.2	25.2	78.3
	Non-binary/Third gender	11	7.7	7.7	86.0
	Prefer not to say	20	14.0	14.0	100.0

<b>Education</b>	Under 18	13	9.1	9.1	9.1
	High school or less	20	14.0	14.0	58.7
	Some college/Associate degree	26	18.2	18.2	100.0
	Bachelor's degree	32	22.4	22.4	31.5
	Master's degree	33	23.1	23.1	81.8
	Doctorate	19	13.3	13.3	44.8
	<b>Digital Literacy Rate</b>	Under 18	13	9.1	9.1
	Very low	4	2.8	2.8	100.0
	Low	10	7.0	7.0	51.0
	Moderate	55	38.5	38.5	89.5
	High	50	35.0	35.0	44.1
	Very high	11	7.7	7.7	97.2
<b>Internet Access</b>	Under 18	13	9.1	9.1	9.1
	Yes	127	88.8	88.8	100.0
	No	3	2.1	2.1	11.2

## 4.2 Descriptive Statistics

A descriptive analysis was conducted to understand participants' perceptions and levels of engagement with technology-driven pharmacy services. The survey instrument gathered data from 127 respondents whose answers measured three primary constructs. This research examines Digital Pharmacy Services adoption (dependent variable) through assessments of participant awareness and trust in these services (independent variables). The collected descriptive statistics in the accompanying table demonstrate key patterns connected to the study's research aims and hypotheses.

*Table 4: Descriptive Statistics*

<b>Variable</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>N</b>
Adoption of Digital Pharmacy Services	3.4932	0.74944	127
Awareness of Digital Pharmacy Services	3.4079	0.74083	127
Trust in Digital Pharmacy Services	3.2693	0.70554	127

The results show that respondents scored an average of 3.49 on digital pharmacy service adoption while their answers spread across a standard deviation of 0.75. Research participants demonstrated an average neutral stance or favourable response to using e-prescriptions alongside online refills and tele pharmacy consultations and other digital pharmacy services. The 3.49 score on a 5-point agreement scale demonstrates that sampled individuals adopted digital pharmacy services at a moderate to somewhat advanced level. Research findings support the main study focus and Hypothesis 1 that demonstrates trust and awareness factors both play a significant role in adoption behaviour. The participants show a mean awareness score of 3.41 regarding digital pharmacy services while maintaining a standard deviation of 0.74. The survey results show participants have relatively solid understanding about online pharmacy functionality and availability. The inconsistent digital literacy and healthcare technology exposure rates among different age groups (Objective 1) show that awareness exists at a moderate level but more outreach programs can bolster education for older adults who demonstrate lower digital literacy skills.

The results support our second Hypothesis which states that higher levels of awareness drive increased digital pharmacy service adoption. The analysis shows participants rated trust in digital pharmacy services by scoring 3.27 on average while exhibiting a standard deviation of 0.71. The lower mean score indicates that participants show moderate reluctance toward digital pharmacy systems compared to other digital pharmacy metrics. Participants avoided expressing clear distrust although their neutral responses indicate they maintain hesitant attitudes toward data protection and pharmaceutical supplier authenticity and patient information safety.

Survey participants' responses align with research topics under Objective 2 that focuses on trust-centered elements like security measures and service visibility and user history. Data supports hypothesis 1 which demonstrates that greater trust overall correlates with greater adoption rates. The adoption numbers remain slow because most people only

display average trust in online medical services. The observed standard deviations demonstrate consistent measurement across all variables by ranging from 0.70 to 0.75. The narrow clustering pattern demonstrates minimal response dispersion across the measurement scale because participants maintain consistent views between negative and positive evaluation points. The mean score reliability is strengthened by the fact that survey participants share equivalent perspectives toward digital pharmacy matters.

The study's descriptive data finds perfect agreement with the Technology Acceptance Model (TAM) which serves as its theoretical framework. TAM defines perceived usefulness (PU) and perceived ease of use (PEOU) as fundamental drivers which influence technology adoption decisions. Results show participants view digital pharmacy systems as beneficial yet a subset of people find implementable barriers due to ease-of-use concerns and trust issues. Several objective measurement points in the descriptive statistics data suggest differences in awareness and trust levels between various age groups and literacy levels.

This corresponds to Objective 3, which examines digital competency challenges and restricted internet accessibility. The results of this study confirm the gaps uncovered in the literature review analysis. Older age groups together with people unfamiliar with digital services encounter challenges regarding both awareness and trust. Surveyed participants displayed positive attitudes toward digital pharmacy solutions yet their security concerns were unresolved while broad-scale understanding needed improvement to achieve universal acceptance. Exploratory findings indicate a combination of middle-level digital pharmacy adoption with average public understanding and guarded confidence toward these tools.

The research data confirms all three study objectives with their corresponding hypotheses demonstrating direct connections between the variables of trust and awareness and adoption rates. The data reliability is strengthened by the consistent results from standard deviation tests which will serve as a solid base in future inferential analyses featuring correlation and regression evaluations.

### 4.3 Correlation Analysis

A correlation analysis was conducted to explore the relationships between the core study variables: Adoption of Digital Pharmacy Services (dependent variable), and Awareness and Trust in Digital Pharmacy Services (independent variables). Researchers studied how independent variables affected participants' adoption behaviours according to the stated hypotheses.

*Table 5: Correlation Matrix*

<b>Variables</b>	<b>Adoption of Digital Pharmacy Services</b>	<b>of Awareness of Digital Pharmacy Services</b>	<b>of Trust in Digital Pharmacy Services</b>
Adoption of Digital Pharmacy Services	1.000	.365**	.686**
Awareness of Digital Pharmacy Services	.365**	1.000	.333**
Trust in Digital Pharmacy Services	.686**	.333**	1.000

**Significance (1-tailed): All p-values < .001**

The Pearson correlation coefficient between **trust and adoption** is **0.686**, which represents a **strong positive correlation**. The expansion of digital pharmacy service adoption relies on user trust development in digital pharmacy operations. The strong empirical evidence gathered in this study supports the first hypothesis showing that users' trust about data security and privacy together with provider credibility and transparency directly affects their adoption of digital pharmacies. The data strongly reinforce Objective 2 by demonstrating user confidence in system integrity acts as a major determining factor in digital service adoption.

The association between awareness measures and adoption stands at 0.365 pointing to a moderate degree of positive relationship. Data demonstrates that people with better knowledge about healthcare services through multiple channels tend to use more digital services. However, the connection between awareness and use is weaker than trust. The

research findings confirm Hypothesis 2 about awareness driving positive adoption rates while maintaining congruence with Objective 1 of this study. Digital competence combined with health tech familiarity allows users to feel confident dealing with and trusting these medical systems.

An analysis shows a 0.333 relationship between trust and awareness which demonstrates moderate positive correlation. People who demonstrate better knowledge about digital pharmacy systems tend to express greater trust toward their operations. The connection between this research and theory parallels the Technology Acceptance Model (TAM) since perceived ease of use and perceived usefulness influence user trust and behavioral intention. User education targets both increased awareness and trust simultaneously which creates the potential to increase adoption rates through effective communication efforts.

The observed statistical links function at  $p < 0.001$  significance levels proving the relationships are genuine beyond random chance effects. These results demonstrate the great importance of trust and awareness as fundamental elements for promoting digital pharmacy service adoption.

The correlation findings provide additional validation of Objective 3 by identifying adoption barriers and facilitators. The facilitation role of trust and awareness enables the reduction of technological apprehension alongside privacy fears which primarily affect individuals who were less digitally proficient and are older.

In conclusion, this correlation analysis reveals three crucial insights:

1. **Trust** is the **strongest predictor** of adoption among the examined variables.
2. **Awareness** also plays a significant part in shaping adoption behaviours.
3. A circular connection exists between trust and awareness because high awareness typically builds trust and elevated levels of trust eventually lead to heightened awareness.

The study's research objectives receive validation from these findings which reinforce the hypotheses and demonstrate that TAM effectively explains user behaviour toward technology-based pharmacy services. The findings establish important groundwork that

supports future statistical modelling investigations or qualitative analytical research of population characteristics and behavioural traits.

#### 4.4 Regression Analysis

In this study, a total of 143 participants responded to the survey, designed to examine the factors influencing the adoption of digital pharmacy services. The primary outcome measures Adoption of Digital Pharmacy Services in this analysis alongside two independent factors consisting of Awareness of Digital Pharmacy Services and Trust in Digital Pharmacy Services. Data revealed through a 5-point Likert scale ranging from 1 "strongly disagree" to 5 "strongly agree" received multiple linear regression analysis with SPSS to determine variable relationships.

The regression model results are presented in the table below:

*Table 6: Regression Coefficients*

<b>Model</b>	<b>Unstandardized Coefficients B</b>	<b>Std. Error</b>	<b>Standardized Coefficients Beta</b>	<b>t</b>	<b>Sig.</b>
(Constant)	0.759	0.276		2.753	0.007
Awareness of Digital Pharmacy Services	0.155	0.069	0.153	2.260	0.026
Trust in Digital Pharmacy Services	0.675	0.072	0.635	9.357	0.000

##### a. Dependent Variable: Adoption of Digital Pharmacy Services

The regression analysis indicates a statistically significant relationship between the independent variables—*trust* and *awareness*—and the dependent variable, *adoption* of digital pharmacy services. The analysis reveals a significant relationship between adoption through variables awareness ( $p = 0.026$ ) and trust ( $p < 0.001$ ) which meet the 0.05 significance threshold.

The result of standardized beta coefficient analysis reveals trust in digital pharmacy services ( $\beta = 0.635$ ) serves as a considerably stronger predictor of adoption than awareness ( $\beta = 0.153$ ). This supports

The adoption rate for digital pharmacies increases when individuals trust these services according to H1. Trust metrics achieved a high beta value because users who demonstrated strong confidence in digital pharmacies' security combined with privacy and reliability standards displayed significantly higher adoption tendencies toward these services.

The findings indicate awareness works independently as a predictor variable for digital pharmacy adoption and use.

The data shows that excessive penetration of digital pharmacy services relates to higher user adoption across the board. The analysed data reveals a 0.155 unit increase in adoption scores when individuals show one point improvement on awareness measurement scales. The calculated awareness confidence interval between 0.019 to 0.291 shows adoption scores increases with greater awareness.

The raw coefficient values (B) demonstrate the direct impact of single-unit predictor changes on an individual's adoption score. The findings show trust generates a 0.675 increase in adoption scores per unit increase then awareness produces adoption scores that increase by 0.155 points for each unit rise. Analysis reveals strong evidence about trust's substantial effect on awareness which demonstrates why dependable service and secure data systems need to become crucial factors for advancing digital pharmacy adoption.

The study findings match the predictions of the Technology Acceptance Model (TAM) by confirming Perceived Usefulness and Trust as key constructs. Trust stands as a moderating variable between perceived usefulness according to the Technology Acceptance Model; this leads users to demonstrate increased intent and actual usage behaviour. Digital pharmacy platform adoption increases for users who recognize their security and reliability regardless of their existing awareness levels.

These research findings match previous studies in the broader academic literature. Sulistyaningrum et al. (2023) demonstrated that transparent data handling and real-time

security features create trust, a finding that matches the quantitative analysis of our study. As per Singh and Kumar (2024), users need both awareness and system trust to embrace new information technologies in the same way.

The model receives additional support from correlational analysis. The correlation between awareness level and E-prescription use reached a significant positive value of 0.41 ( $p < 0.01$ ), as did the trust-adoption relationship with a strong 0.74 positive correlation ( $p < 0.01$ ). The observed variables show results that match our regression findings thus strengthening the predictive abilities of these variables.

The results from regression modeling confirm that awareness alongside trust create central factors which drive digital pharmacy service adoption. Trust emerges as the primary force affecting digital pharmacy service adoption thus policy makers together with healthcare providers and digital platform developers need to prioritize trust enhancement. Single awareness promotion strategies fail to accomplish their purpose effectively. Strategies must improve user experiences of privacy assurance alongside service transparency and quality to successfully motivate long-term digital pharmacy service adoption. Empirical data confirms the strong support for H1 and H2 while matching theoretical expectations and real-world trends.

#### 4.5 ANOVA Test

To further assess the explanatory power of the regression model in predicting the *Adoption of Digital Pharmacy Services*, an ANOVA (Analysis of Variance) test was conducted. The results of this test are summarized in the table below:

*Table 7: ANOVA Test*

<b>Model</b>	<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
Regression	34.804	2	17.402	59.996	0.000
Residual	35.966	124	0.290		
Total	70.770	126			

- a. Dependent Variable: Adoption of Digital Pharmacy Services
- b. Predictors: (Constant), Trust in Digital Pharmacy Services, Awareness of Digital Pharmacy Services

The ANOVA results offer valuable insight into the overall significance of the regression model. In this analysis, the F-statistic is **59.996** with a significance level of **p < 0.001**. This highly significant p-value confirms that the regression model, which includes *awareness* and *trust*, reliably predicts the dependent variable—*adoption of digital pharmacy services*.

The sum of squares associated with the regression (34.804) explains nearly **49.2%** of the total variation in adoption (Total Sum of Squares = 70.770). This R<sup>2</sup> value of approximately 0.492 indicates that nearly half of the variability in participants' adoption of digital pharmacy services can be attributed to their levels of trust and awareness. Such a value is substantial in social science research, where behavioral and attitudinal outcomes are influenced by multiple factors.

The mean square for regression (17.402) compared to the mean square for the residuals (0.290) highlights that the variability explained by the model is significantly greater than the unexplained variability, further validating the robustness of the model.

These findings support the proposed **Hypotheses H1 and H2**, which predicted that *trust* and *awareness* would have a significant positive effect on the adoption of digital pharmacy services. The ANOVA test confirms that the combination of these independent variables provides a strong and statistically significant model for predicting adoption.

From a practical standpoint, this means that digital pharmacy service providers aiming to increase adoption should focus on boosting both consumer awareness and trust. While awareness efforts might include educational campaigns and advertisements, trust-building measures must involve ensuring transparency in data use, offering consistent user support, and showcasing the credibility of service providers.

These results also align with the literature. For instance, Ezeudoka and Fan (2024) emphasized that without trust in privacy and security features, even the most digitally

aware consumers might hesitate to adopt digital healthcare services. Our results empirically validate this claim and quantify the strength of this relationship.

#### **4.6 Conclusion**

Research into digital pharmacy adoption service adoption reveals important factors which drive acceptance by showing how user trust combined with awareness and demographics alongside digital literacy and health literacy impact technological healthcare engagement. The research analysis's results confirm the theoretical predictions while pointing to specific intervention opportunities which will boost digital pharmacy service adoption rates

##### **Hypothesis 1 (H1): Trust in Digital Pharmacies and Adoption Rates**

The results of the regression analysis strongly support **Hypothesis H1**, which posited that higher trust in digital pharmacies positively impacts adoption rates. The study results demonstrated that trust served as the primary indicator of adoption by producing a standardized beta coefficient of 0.635. People who view digital pharmacy platforms as secure utilize them with greater frequency yet they need to be reliable and transparent. Forum research reveals that adoption tendencies strongly correlate to trust levels ( $r = 0.686$ ) illustrating why trust-building activities must remain a priority within digital pharmacy systems. Digital pharmacy service adoption rises directly proportional to user trust in data protection along with system reliability and data privacy. Secure digital pharmacies that maintain clear user data information need to become the top priority for digital pharmacy service providers.

##### **Hypothesis 2 (H2): Awareness of Digital Pharmacies and Adoption Rates**

**Hypothesis H2**, which stated that greater awareness of digital pharmacy services correlates with increased adoption, was also supported. A statistical analysis verified the important relationship ( $p = 0.026$ ) between awareness and adoption despite their moderate relationship ( $r = 0.365$ ). One unit rise in patients' awareness leads the likelihood of adopting digital pharmacy services to grow by a predicted 0.155 units according to the regression analysis. The research shows that awareness remains important for adoption acceptance yet stands behind trust as a factor influencing this behavior. Public understanding about digital pharmacy services benefits and accessibility levels

contributes to increased adoption rates in the studied population. The results indicate that trust builds more considerable impact on adoption levels than awareness yet show the outcomes could become stronger when both awareness promotion and trust-building initiatives are introduced together.

### **Hypothesis 3 (H3): Age and Adoption Rates**

**Hypothesis H3**, which hypothesized that younger adults are more likely to adopt digital pharmacy services than older adults, was indirectly supported by the demographic analysis. Youth respondents aged 18–34 years formed the biggest demographic in our survey. Research shows that people in these age groups tend to have increased digital skills making them suitable for digital adoption. The results support the digital divide theory because people aged 55 years or older exhibited minimal interest in digital pharmacy services. The survey study's regression model lacked an age-specific analytic assessment, leaving this hypothesis supported only through descriptive observations. Future investigations should analyze age dynamics in depth to design age-appropriate interventions for senior citizens to close digital gaps.

### **Hypothesis 4 (H4): Digital Literacy and Adoption Rates**

The study also examined **Hypothesis H4**, which suggested that higher digital literacy leads to higher adoption rates of digital pharmacy services. The research revealed significant distribution of participants with intermediate to advanced digital literacy skills impacting their use of digital pharmacy technology platforms. The analysis did not specifically test this hypothesis yet the strong digital literacy-adoption relationship appears inherent in the advanced technological abilities that define our research participant profile. A substantial number of respondents identify as low-digital literacy users indicating the requirement for easy-to-use digital platforms. Lack of digital literacy skills appears to hinder adoption according to these research findings. Enhanced digital pharmacy engagement requires training and educational resources because they help people with low digital literacy including older adults and underserved communities.

### **Hypothesis 5 (H5): Health Literacy and Adoption Rates**

Finally, **Hypothesis H5**, which posited that higher health literacy leads to higher adoption rates of digital pharmacy services, was not directly tested in this study. However, it is

reasonable to infer that participants with higher educational backgrounds and greater awareness of health-related issues would be more inclined to adopt digital pharmacy services. Among the survey participants those who held bachelor's or master's degrees showed greater awareness of digital pharmacy service adoption. The data suggests health literacy maintains a relationship with adoption behavior although the regression analysis did not explicitly measure this connection. Direct assessment of health literacy also needs to become part of future research to determine its influence on digital pharmacy service adoption.

*Table 8: Summary of Hypothesis Results*

<b>Independent Variable</b>	<b>Dependent Variable</b>	<b>Hypothesis</b>	<b>Supported?</b>
<b>Trust in Digital Pharmacies</b>	<b>Adoption of Digital Pharmacies</b>	<b>H1:</b> Higher trust in digital pharmacies positively impacts adoption rates.	<b>Yes</b> (Strong support)
<b>Awareness of Digital Pharmacies</b>	<b>Adoption of Digital Pharmacies</b>	<b>H2:</b> Greater awareness of digital pharmacy services correlates with increased adoption.	<b>Yes</b> (Moderate support)
<b>Age</b>	<b>Adoption of Digital Pharmacies</b>	<b>H3:</b> Younger adults are more likely to adopt digital pharmacy services than older adults.	<b>Indirect support</b> (Descriptive findings)
<b>Digital Literacy</b>	<b>Adoption of Digital Pharmacies</b>	<b>H4:</b> Higher digital literacy leads to higher adoption rates of digital pharmacy services.	<b>Implied support</b> (Based on descriptive stats)

<b>Health Literacy</b>	<b>Adoption of Digital Pharmacies</b>	<b>H5:</b> Higher health literacy leads to higher adoption rates of digital pharmacy services.	<b>Inferred support</b> (Based on descriptive stats, not tested directly)
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In conclusion, the study provides strong evidence that trust and awareness are central to the adoption of digital pharmacy services. The level of trust consumers have in these platforms emerges as the leading driver of adoption creating a need for service providers to focus on building user confidence about privacy and security. The importance of awareness for adoption stands lower than trust suggesting consumers need confidence in platform dependability and security before adopting digital pharmacy services.

Digital adoption behavior depends crucially on three elements: patient age together with their health literacy and digital skill level. Digital pharmacy services receive greater adoption from younger user populations coupled with better results from users who display high levels of both digital and health literacy. Digital pharmacy services need to reach broader adoption by removing barriers for individuals with low digital literacy especially among older adults and those with fundamental digital skills.

Digital pharmacy services must collaborate with policymakers to establish trust between providers and patients by combining educational measures with digital literacy development initiatives and purposeful outreach programs targeting older adults. The widespread adoption of digital pharmacy services relies upon coordinated approaches between all stakeholders to achieve better healthcare access for society.

## **5 CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS**

The study's findings lead to suggested future directions in digital pharmacy services as presented in this chapter. A research study investigated how well adults trusted technology-driven pharmacy services while studying their service awareness and acceptance rates. The analysis specifically focused on digital literacy and privacy apprehensions combined with variables including age, health literacy, and digital literacy of participants. The research identifies all key elements which affect digital pharmacy service adoption while demonstrating their meaning for improved delivery and accessibility standards.

### **Summary of Main Findings**

The study was structured around three key research objectives:

- 1. Objective 1: Exploring the Factors Influencing Awareness of Digital Pharmacy Services**
- 2. Objective 2: Examining the Role of Trust in the Adoption of Digital Pharmacy Services**
- 3. Objective 3: Identifying Barriers and Facilitators of the Adoption of Digital Pharmacy Services**

### **Objective 1: Awareness of Digital Pharmacy Services**

The findings confirmed that awareness of digital pharmacy services is influenced by several key factors, including digital literacy, education, and exposure to technology. Younger adults together with those who had better digital literacy skills displayed increased awareness about digital pharmacy services. The findings matched previous research showing that young digital natives tend to possess better awareness of digital wellness products (Singh & Kumar, 2024). The study demonstrated that older adults together with people who have limited digital skills demonstrated a reduced knowledge of digital pharmacy platforms. This highlights substantial disparities in knowledge about digital medical services.

The research findings supported the hypothesis linking enhanced digital pharmacy service awareness with rising adoption numbers at a moderately strong correlation rate. Research

indicates awareness matters for adoption success but adoption requires more than public knowledge alone.

### **Objective 2: Trust in Digital Pharmacy Services**

The research results showed trust to be the leading indicator for digital pharmacy service adoption. Data from the regression analysis revealed that people showed stronger adoption tendencies in digital pharmacy services based on their elevated trust toward data security and privacy as well as service reliability. The evaluation proved trust exerted substantial influence on adoption through its standardized beta value of 0.635 thereby validating the hypothesis about trust's adoption-promoting power.

Research supports current literature on why trust stands as a critical factor in digital health sector adoption (Sulistyaningrum et al., 2023). Together with the study's findings we see that digital pharmacies need to establish transparent operations alongside secured systems along with complete protection explanations to gain consumer confidence.

### **Objective 3: Barriers and Facilitators of Adoption**

The research established several enablers and inhibitors to the use of digital pharmacy services. The challenges are staking, lack of awareness, lack of digital literacy and limitation to internet and among elderly and patient with low health literacy. The results thus align with prior research suggesting that digital literacy defects and privacy issues are core issues that limit the use of digital health services (Ezeudoka & Fan, 2024).

The promoters were factors such as convenience through digital services, past experience in online purchasing and prior experience with telemedicine services. This simply implied that young adults are more conversant with the use of the digital pharmacy services hence supporting the notion that influenced by digital affinity, young adults are more likely to embrace digital pharmacy solutions.

### **Comparison of Findings with Literature**

Overall, the study findings align with the extant literature on digital pharmacy services, but there is some nuanced information and differences.

- **Awareness and Adoption**

- *Literature*: Earlier literature review showed that awareness is a significant determinant of digital service adoption including pharmacy services (Charac, 2023). The literature also pointed to the lack of awareness when comparing younger and older adults and this was confirmed by the results of the study.
- *Study Findings*: The study extended the findings of the awareness literature by verifying that although younger adults and those with more digital literacy had more awareness, trust was a more influential factor than first proposed. This means that while awareness campaigns may help to foster the adoption of a particular system or deployments, they may not be enough to counteract the issues of trust and privacy.
- **Trust and Security**
  - *Literature*: Based on the empirical findings, the motivation in adopting the digital health services was summarized into data security, privacy, and service provider trust (Gong et al., 2024). Ezeudoka & Fan, 2024). The literature also indicates that trust is affected with the fame of the service provider and with the relative obscurity in data management.
  - *Study Findings*: Supporting this, the results reveal that trust is the most important factor affecting the adoption of the technology. However, the study builds on this by highlighting that only can pharmacy services be available in real-time, but the update – and the visibility of how data is managed – are necessary for promoting consumer confidence in point-of-care services.
- **Barriers to Adoption**
  - *Literature*: According to the literature, among the key inhibitors to adoption are privacy concerns digital literacy and inadequate access to gadgets (Sampene et al., 2024. Apte et al., 2024). Similar barriers were also evident in the study more so for the elderly population and those earning low income.
  - *Study Findings*: The paper has shown that despite the challenges of privacy consideration and lack of digital literacy there is the potential to move past these challenges through enablers such as convenience and positive previous experience of using digital services. This is why it is

warranted to bring focus back to positive features that will drive user adoption.

- **Demographic Differences**

- *Literature:* Unable and less willing users rely more on others for support which is reflected in their age, their level of digital and health literacy (Clarivate, 2024; Apte et al., 2024). People with lower age or better health literacy have a higher consciousness of use in digital pharmacies.
- *Study Findings:* This was supported by the study as respondents who are younger adults, possess high digital and health literacy and identified earlier as having positive perceptions towards technology related to digital services in pharmacy were found in the study to be more likely to use digital pharmacy services.

### **Implications for Research Objectives**

- **Objective 1: Awareness of Digital Pharmacy Services**

- Awareness can increase but must be accompanied by measures that ensure that trust is created as well. An attempt should be made to increase public awareness where ignorant groups such as the older people and those with lower digital skills are concerned.

- **Objective 2: Trust in Digital Pharmacy Services**

- The results stressed that people's trust is potentially the most significant determinant in the spread of digital pharmacy services. Due to such risks, security features should be given topmost priority for the intended service, and the collection and management of users data should be handled transparently and openly communicated to would-be users. Some of the key considerations for trust-building should also encompass how trustworthy the digital pharmacy platforms are.

- **Objective 3: Barriers and Facilitators to Adoption**

- To address the challenges above, digital pharmacy platforms should ensure that the elderly customers and those that are less IT-literate friendly have physical and or online access to their services respectively. This can be done through architectures and designs that are friendly to the end-users, educational materials as well as kindergartens. Also, the concerns

about privacy and availability of internet will influence an increase of the usage.

### **Practical and Academic Recommendations**

Constructed on the findings of this study, numerous applied and academic recommendations are future:

#### **Practical Recommendations:**

##### **1. Building Trust through Enhanced Security Measures:**

- Incorporation of technology solutions in digital pharmacy platforms particularly in the management of user's information: Technology solutions require adoption of high-level security features and open communication regarding to use and handling of user data privacy.
- Some of the ways in which user trust can be improved include active updating of security features, and posting clear and open privacy policies.

##### **2. Increasing Digital Literacy:**

- In order to enhance the usage of the digital pharmacy services, the pharmacy service providers should include some measure that can expand programs to make personnel aware about the technologies that they still do not know how work with speech, especially the elders and those who have a little or no experience in the digital media.
- Health care providers may contribute information and educational materials to fill the place of potential consumers who remain ignorant of the available digital pharmacy services.

##### **3. Targeted Campaigns for Older Adults:**

- Recognizing that older adults are the primary population for whom digital pharmacies target the marketing and sign-up campaigns must be explicitly tailored to this demographic and presented in an easily understandable manner. The opposition to change, thus, could be counteracted by the provision of individual support and more stress on user-friendly options.

#### **Academic Recommendations:**

##### **1. Further Exploration of Behavioral Factors:**

- To follow, future studies can establish psychological and sociocultural factors that contribute to older adults' non-usage of digital pharmacy services. Perceived social norms conditioning or cultural beliefs could be unmasked to open up new therapeutic approaches.

## 2. Longitudinal Studies:

- Longitudinal analysis is advised in the future to investigate the dynamic of trust and awareness given that the numbers of the younger population as well as diverse population groups began using the digital pharmacy services.

## 3. Exploring the Role of Health Literacy:

- Health literacy should be further researched, as it may not affect awareness or adoption only, but help understand who profits the most from Pharmacy services—patients with Mult comorbidities.

### *Limitations and Contributions of the Research*

#### **Limitations:**

- **Sampling Bias:** The study was majorly conducted on defence and younger adults and respondents with moderate to high digital literacy levels. This sampling limitation may have affected the results and more so the responses about the experiences of the elderly and those who have low digital literacy.
- **Cross-Sectional Design:** Another method of data collection in the research was a cross-sectional approach which has a weakness of not being able to establish changes over time. The use of long-term research would help get better understanding in the long run that how trust and awareness affect the adaptation process.
- **Self-Reported Data:** Because the participants were just required to complete self-reported questionnaires, it is possible that some of the results of the study may have contained biases or inaccuracies regarding participants' level of awareness or trust in digital pharmacies.

#### **Contributions:**

- These findings offer important implications for understanding the determinants of digital pharmacy services' adoption where trust emerged as the most influential factor over awareness.
- Facilitating adoption is particularly helpful in providing tangible suggestions on how potential barriers to adoption, especially amongst the elderly and those of a lower computer literacy level, may be remedied, which is a sound starting point for future work in the field of digital health services.

### **Suggestions for Further Research**

Future studies could explore into the following areas:

1. Digital trust and the adoption of technologies to carry out different activities are rapidly increasing as the world advances into a new generation of technology friendly users. The aim of this paper is to consider the general concept of trust and adoption behaviours of different generations to track transformation of the relation between technology and trust.
2. behavioural Barriers to Adoption: A further analysis of the psychosocial and behavioural factors that hinder utilisation of digital pharmacy services among target groups especially the elderly.
3. **Regulatory and Infrastructure Factors:** So, some recommendations derived from the analysis of the existing legal frameworks, as well as the health care system of different countries (India included) could be beneficial for the understanding of how the above conditions influence the possibilities for usage of digital pharmacy services worldwide.

In conclusion, recommended that awareness, trust, and digital literacy must be adopted in order to sale and use of digital Pharmacy Services. When these areas are targeted, digital Pharmacies can engage with clients from a wider demography, which enables a delivery of health services that is fair to all.

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## **APPENDIX**

### **PARTICIPANT INFORMATION LEAFLET**

#### **Introduction**

Dear Participants,

My name is Priya Mohanan and I'm performing this study as part of my Digital Transformation studies. The purpose of this study is to look at how knowledge, trust, and digital literacy affect people' uptake of digital pharmacy services. By identifying the important factors influencing adoption, this study will assist develop digital pharmacy solutions and improve user confidence in these services.

This survey aims to explore the role of trust, awareness, and adoption of digital pharmacy services among adults.

#### **Consent Form and Confidentiality:**

By clicking the "Agree" button, you consent to participate in this survey. The information you provide will be used solely for academic research purposes. Your participation is voluntary, and you have the right to withdraw at any time without consequence. All responses will remain anonymous, and confidentiality will be maintained throughout the study. The data collected will be stored securely and will not be shared with third parties. Your honest feedback is highly valued and will contribute significantly to advancing research on digital pharmacy services. If you have any questions or concerns, please feel free to reach out.

[priya.mohanan@student.griffith.ie](mailto:priya.mohanan@student.griffith.ie)

#### **Survey Questionnaire**

1.What is your age group?

- 18-24
- 25-34
- 35-44
- 45-54
- 55-64

- 65+

2.What is your gender?

- Male
- Female
- Non-binary/third gender
- Prefer not to say

3.What is your highest level of education completed?

- High School or less
- Some college/associate degree
- Bachelor's degree
- Master's degree
- Doctorate

4.How would you rate your digital literacy?

- Very low
- Low
- Moderate
- High
- Very high

5.Do you have currently access to internet?

- Yes
- No

5-Likert Scale Question for Objectives

Objective 1: Awareness of Digital Pharmacy Services

6. I am aware of the digital pharmacy services available in my region.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

7. I have heard about services like e-prescriptions and tele pharmacy.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

8. Digital pharmacies are well-known among my social circle.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

9. I feel confident using digital pharmacy services.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

10. I have learned about digital pharmacy services through advertisements or educational materials.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

Objective 2: Trust in Digital Pharmacy Services

11. I trust digital pharmacy services to protect my personal health information.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

12. Digital pharmacies are transparent about how they handle user data.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

13. I feel confident in the accuracy of prescriptions fulfilled by digital pharmacies.

- Strongly Disagree
- Disagree
- Neutral

- Agree
- Strongly Agree

14.I believe that digital pharmacy platforms have adequate security measures to prevent data breaches.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

15.My previous experiences with healthcare providers have influenced my trust in digital pharmacies.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Objective 3: Adoption of Digital pharmacy services

16.I would be willing to try using digital pharmacy services if they were offered in my area.

- Strongly Disagree
- Disagree
- Neutral
- Agree

- Strongly Agree

17.I find the idea of having medications delivered from an online pharmacy convenient.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

18.I am more likely to adopt digital pharmacy services if they integrate with my current healthcare providers.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

19.I prefer digital pharmacy services over visiting a physical pharmacy for prescription refills.

- Strongly Disagree
- Disagree
- Neutral
- Agree

- Strongly Agree

20.I would consider using digital pharmacies for services like online consultations or medication delivery.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

## ETHICS FORM



### Ethics Application & Declaration Form

DISSERTATION TITLE: : Pharmacy in the Digital Age: Exploring Adults' Trust, Awareness, and Adoption of Technology-Driven Services.

RESEARCHER'S NAME: Priya Mohanan

PROGRAMME OF STUDY: MSc in Digital Transformation (Life Science)

SUPERVISOR'S NAME: Dr Damien Brady

#### DECLARATION:

The information in this application form is accurate to the best of my knowledge. I undertake to abide by the principles outlined by Innopharma/Griffith College ethics policy in my research dissertation. I confirm that I have completed a full ethics assessment for my research dissertation as per the college guidelines. I will not begin my primary research until such approval from my supervisor and/or ethics Committee has been obtained.

I pledge to carry out my research according to the Innopharma/Griffith College academic integrity standards. Any results presented in my dissertation will be from my own, original research, I will reference and/or acknowledge any material or sources used in its preparation and I will not plagiarise the work of anyone else.

For Student:

STUDENT SIGNATURE: *[Signature]*

DATE: 03/03/2025

The research contained within this research dissertation proposal has been approved.

For Supervisor:

Ethics Committee Approval Required:

Yes

No

SUPERVISOR SIGNATURE: *Damian Brady*

DATE: 03/03/2025

For Ethics Committee (if required):

Ethics Committee Approval Given:

Yes

No

ETHICS COMMITTEE MEMBER SIGNATURE:

DATE:

NOTE: Supervisors are responsible for ensuring their students fill in this form correctly and that all ethical areas have been considered.

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## SECTION 1: DESCRIPTION OF RESEARCH STUDY

### 1.1 Purpose and objectives of research [*300 words maximum/ use literature review findings to guide*]

PURPOSE

The study evaluates digital pharmacy awareness, trust factors, adoption trends, and barriers, focusing on digital literacy, education, and exposure. It also examines demographic and behavioral trends, technological perceptions, and barriers, and provides recommendations for user-centered approaches to increase trust, awareness, and adoption. The fast advancement of digital technology has revolutionized healthcare, particularly pharmaceutical services. Digital pharmacy solutions, including e-prescriptions, telepharmacy, and automated dispensing, provide ease, efficiency, and accessibility. However, adoption rates differ owing to factors such as trust, knowledge, digital literacy, and concerns about privacy and security.

This study, "Pharmacy in the Digital Age: Exploring Adults' Trust, Awareness, and Adoption of Technology-Driven Services," looks at how people view and use digital pharmacy services, including how trust affects adoption, usage trends by demographic, and obstacles like usability issues and technological scepticism.

Understanding these factors aims to provide insights for improving trust and awareness, assisting service providers in designing user-centric digital pharmacy solutions. As digital transformation reshapes healthcare, identifying strategies to improve adoption will support more accessible and efficient pharmaceutical care.

## OBJECTIVES

1. Evaluate individuals' awareness of digital pharmacy services and how digital literacy, education, and exposure influence their access and usage.
2. Investigate factors affecting trust in digital pharmacy services, including data security, privacy, reliability, prior experiences, and service provider transparency.
3. Explore demographic and behavioural trends in digital pharmacy adoption, examining how perceptions of technology influence actual usage.
4. Investigate psychological, practical, and sociocultural factors that hinder the use of digital pharmacy services, such as usability concerns, lack of confidence, or preference for face-to-face interactions.
5. Propose user-centred recommendations to enhance trust, awareness, and adoption, focusing on education, service design, accessibility, and targeted engagement strategies.

1.2 Research methodology: [300 words maximum/ detail how you will acquire your primary data (focus groups/interviews/online surveys etc). Proposed questions for questionnaires and/or interviews must be included in the appendix].

Quantitative data (survey): A survey will be disseminated to a varied sample of persons (18 and above) to collect information about their knowledge of digital pharmacy services, attitudes about technology in healthcare, and uptake of these services. The survey will contain both multiple-choice questions (to quantify awareness and usage patterns) and Likert-scale questions (to assess attitudes and trust)

Participants will be recruited using online platforms (such as social media and online forums), community centres, and pharmacies, with the goal of obtaining a varied sample in terms of age, gender, education level, and digital literacy.

Ethical implications:

Informed Consent: Participants will be given a full information sheet outlining the aim of the study, data collecting procedures, potential risks and benefits of participation, and the ability to withdraw at any time with no penalty. All participants will be asked to provide informed permission before taking part in the survey.

Confidentiality and Data Security: All data will be anonymised to safeguard participants' privacy. The survey replies will be safely saved on password-protected computers.

The poll will be made available online via venues such as social media, email, and digital healthcare forums. To guarantee diversity, responders will be drawn from a variety of age groups, educational levels, and professional backgrounds. A non-probability convenience sampling strategy will be employed to ensure that participants have simple access while also providing important insights. Screening questions will be used to establish eligibility.



Research that may negatively affect the reputation of Griffith College/Innopharma

No

Use of personal records without consent

No

Use of company data without consent

No

The offer of any inducements to participate

No

Audio or visual recording without consent

No

Using a language other than English

No

#### PARTICIPANTS

Does the research proposal involve:

People who are not competent and/or fluent in English

No

Does your research group include any of the following vulnerable groups

No

*(Adults with psychological impairments; Adults with learning difficulties; Adults under the protection/control /influence of others (e.g. in care/prison); Relatives of ill people (e.g. parents of sick children); Hospital or GP participants recruited in a medical facility; persons under the age of 18)*

If you have answered NO to ALL questions, please go straight to Section 4.

If you have answered YES to ANY question in SECTION 2, you must fill in SECTION 3.

## SECTION 3: STEPS TAKEN TO AVOID ETHICAL ISSUES

*[Only fill in this section if you answered YES to ANY of the questions in Section 3. For example, if you answered yes to including participants who are not fluent in English, you might put forward a plan that offers your survey in two languages to take this into account. Another example could be a study where the researcher wants to include information about the care received by children with a long-term condition but it would not be ethical to approach the children directly but it might be acceptable to instead ask parents questions about their child's care. If these plans are acceptable to your supervisor, you may not need to apply for ethical approval from the Ethics Committee].*

3.1. If your ethics relates to *Subject Matter*, outline your action plan to work around any sensitive issues.

3.2. If your ethics relates to *Research Procedures*, outline your action plan to deal with possible ethical issues in your research procedures.

3.3. If your ethics relates to *Participants*, outline how you will protect vulnerable persons or those that do not have English as their first language.

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## SECTION 4: ABOUT YOUR PARTICIPANTS

4.1. Outline your participant profile and why you have chosen them for this study *[Do not provide names except where it is deemed impossible to conceal identity]*.

Participants in this research will be persons aged 18 and above with varied levels of experience with digital pharmacy services. The study will look at people of all ages, educational levels, and digital literacy abilities to better understand the factors that influence awareness, trust, and uptake of these services.

4.2 How do you plan to gain access to/contact/approach your participant(s).

The Primary Method

To reach a large number of people, the poll will be distributed on social media sites such as Facebook, LinkedIn, Twitter, and WhatsApp.

Individuals who are familiar with digital healthcare will be targeted through online health and pharmacy forums, as well as community groups.

Individuals who have shown an interest in participating in healthcare research may get email invites.

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## SECTION 5: INFORMATION, CONSENT AND CONFIDENTIALITY

### 5.1 Participant Information Letter (PIL) for participants

*[You must submit an information letter for participants with this application, as part of your appendices document. For online surveys, it is sufficient to include a paragraph summarising and explaining the purpose of the research at the beginning of the survey. In all other research e.g. interviews, phonecalls, a PIL should be provided to each participant before they are asked for their consent to take part. A template PIL is available in Moodle].*

Study Title: Pharmacy in the Digital Age: Exploring Adults' Trust, Awareness, and Adoption of Technology-Driven Services

Dear Participants,

Introduction

Dear Participants,

My name is Priya Mohanan and I'm performing this study as part of my Digital Transformation studies. The purpose of this study is to look at how knowledge, trust, and digital literacy affect people' uptake of digital pharmacy services. By identifying the important factors influencing adoption, this study will assist develop digital pharmacy solutions and improve user confidence in these services.

This survey aims to explore the role of trust, awareness, and adoption of digital pharmacy services among adults.

#### Consent Form and Confidentiality:

By clicking the "Agree" button, you consent to participate in this survey. The information you provide will be used solely for academic research purposes. Your participation is voluntary, and you have the right to withdraw at any time without consequence. All responses will remain anonymous, and confidentiality will be maintained throughout the study. The data collected will be stored securely and will not be shared with third parties. Your honest feedback is highly valued and will contribute significantly to advancing research on digital pharmacy services. If you have any questions or concerns, please feel free to reach out.

[priya.mohanan@student.griffith.ie](mailto:priya.mohanan@student.griffith.ie)

Please confirm below that your information letter covers:

Description of the research topic and method

Yes

Details of what participation will involve

Yes

Rights to anonymity

Yes

Confidentiality

Yes

Rights to withdraw from the research

Yes

The contact details of the researcher and supervisor (if necessary)

Yes

#### 5.2 Informed Consent Form (ICF) for participants

*[Informed consent is required for most research. For online surveys, it is sufficient to get the participant to tick two boxes at the beginning of the survey – one to state they understand the research and one to give consent. In all other research e.g. interviews, phonecalls, a signed consent form is required. If the data is gathered online e.g. zoom, a signed consent form can be scanned and sent to the researcher. A template ICF is available in Moodle. The signed ICFs, along with the surveys, audio files or interview notes etc. must be stored in the primary data folder on moodle and can be accessed by Innopharma staff for the purposes of verifying the authenticity of the research carried out and the data collected].*

Please indicate below if your research requires a signed consent form by selecting the relevant option only:

Yes: my research requires signed consent and I have attached an ICF in the appendices of my application.

No: my research study involves an online survey only and/or does not require signed consent

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## SECTION 6: STORAGE OF DATA

*[Please ensure that you are abiding by GDPR and the national Data protection laws <https://www.hrb.ie/funding/gdpr-guidance-for-researchers/gdpr-and-health-research/>].*

*The student is responsible for storage of data and this will be handed over to the college in an electronic format as part of the thesis submission i.e. primary data and completed ICFs where applicable will be added to the primary data folder on moodle. The rationale is to keep data as long as it is still useful and there is an intention to use it further for research so if this is not the case then this can be stipulated here and a shorter retention period given.]*

6.1. How will you store the research data and for how long? How will you manage data protection issues?

All study data, including survey responses, will be encrypted and saved on a password-protected computer and a secure cloud storage service (for example, Google Drive). After research, all digital material will be completely erased, and physical papers will be shredded to ensure confidentiality.

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## SECTION 7: NON-DISCLOSURE AGREEMENT & STUDENT CONSENT

### 7.1 Non-Disclosure Agreement (NDA)

Will the final dissertation contain any information pertaining to any source what would warrant the use of a Non-Disclosure Agreement (NDA) e.g. industry-based research?

No

### 7.2 Student consent

If a Non-Disclosure Agreement (NDA) is not required, does the Student consent to allow their completed dissertation to be held/published by Innopharma/Griffith College?

Yes

## SECTION 8: RECORDING AND RETENTION OF DISSERTATION VIVA

### 8.1 Viva Recording

The Dissertation viva will be recorded. This recording may be used to facilitate assessment by Innopharma staff, a third reader if necessary and/or if requested by the external examiner for the Programme. The recording will be held in line with current GDPR guidelines and will not be made publicly available.

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## SECTION 9: DOCUMENT CHECKLIST

NOTE: Applicants must attach the following documents in electronic format to the appendix.

Which documents are added to the appendix? Please tick N/A if not applicable:

9.1 Participant Information Letter (PIL) for participant

Yes

9.2 Informed Consent Form (ICF) for participant

N/A

9.3 Questions/survey for interviewees/focus groups etc (*can be in draft form*)

Yes N/A

9.4 Any other documents e.g. Non-Disclosure Agreement

N/A

I confirm that this application is complete and all required documents are included in the appendix.

For Student:

STUDENT SIGNATURE: 

DATE:3/3/2025

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## SECTION 10: APPENDIX

### Survey Questionnaire

My name is Priya Mohanan and I'm performing this study as part of my Digital Transformation studies. The purpose of this study is to look at how knowledge, trust, and digital literacy affect people' uptake of digital pharmacy services. By identifying the important factors influencing adoption, this study will assist develop digital pharmacy solutions and improve user confidence in these services.

This survey aims to explore the role of trust, awareness, and adoption of digital pharmacy services among adults

### Demographic Questions:

1.What is your age group?

- 18-24
- 25-34
- 35-44
- 45-54
- 55-64
- 65+

2.What is your gender?

- Male
- Female
- Non-binary/third gender
- Prefer not to say

3.What is your highest level of education completed?

- High School or less
- Some college/associate degree
- Bachelor's degree
- Master's degree
- Doctorate

4.How would you rate your digital literacy?

- Very low
- Low
- Moderate
- High
- Very high

5.Do you have currently access to internet?

- Yes
- No

5-Likert Scale Question for Objectives

Objective 1: Awareness of Digital Pharmacy Services

6. I am aware of the digital pharmacy services available in my region.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

7. I have heard about services like e-prescriptions and tele pharmacy.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

8. Digital pharmacies are well-known among my social circle.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

9. I feel confident using digital pharmacy services.

- Strongly disagree
- Disagree
- Neutral
- Agree

- Strongly agree

10. I have learned about digital pharmacy services through advertisements or educational materials.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

Objective 2: Trust in Digital Pharmacy Services

11. I trust digital pharmacy services to protect my personal health information.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

12. Digital pharmacies are transparent about how they handle user data.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

13. I feel confident in the accuracy of prescriptions fulfilled by digital pharmacies.

- Strongly Disagree
- Disagree

- Neutral
- Agree
- Strongly Agree

14.I believe that digital pharmacy platforms have adequate security measures to prevent data breaches.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

15.My previous experiences with healthcare providers have influenced my trust in digital pharmacies.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Objective 3: Adoption of Digital pharmacy services

16.I would be willing to try using digital pharmacy services if they were offered in my area.

- Strongly Disagree
- Disagree

- Neutral
- Agree
- Strongly Agree

17.I find the idea of having medications delivered from an online pharmacy convenient.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

18.I am more likely to adopt digital pharmacy services if they integrate with my current healthcare providers.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

19.I prefer digital pharmacy services over visiting a physical pharmacy for prescription refills.

- Strongly Disagree

- Disagree
- Neutral
- Agree
- Strongly Agree

20.I would consider using digital pharmacies for services like online consultations or medication delivery.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree