ENSIGN GLOBAL COLLEGE

KPONG, EASTERN REGION, GHANA

FACULTY OF PUBLIC HEALTH

DEPARTMENT OF COMMUNITY HEALTH

PREDICTORS OF MOBILE TECHNOLOGY ADOPTION FOR NHIS RENEWAL SERVICE IN THE LOWER MANYA KROBO MUNICIPALITY IN THE EASTERN REGION, GHANA

BY

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AUGUST, 2022

TITLE PAGE

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AUGUST, 2022

DECLARATION

The research work described in this thesis was carried out at Ensign Global College. This work has not been submitted for any other degree. Information taken from other works has been specially and duly acknowledged.

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DEDICATION

This thesis is dedicated to my wife, Mavis Etriakor, and my children, Selikem and Yorm Kumahor, who have been a continuous source of encouragement and support throughout the challenges of graduate school and life. I am very appreciative to have them in my life. This work is also dedicated to my Family and In-Laws, who have always loved me unconditionally and whose exemplary behavior has inspired me to work diligently to attain my goals.

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ABBREVIATION/ACRONYMS

AC	ACCESSIBILITY
BI	BEHAVIORAL INTENTION
DOI	DIFFUSION OF INNOVATION
ICT	INFORMATION COMMUNICATIO TECHNOLOGY
ID	IDENTIFICATION
IU	INTETION TO USE
KMO	KAISER-MEYER-OLKIN MEASURE
LMKM	LOWER MANYA KROBO MUNICIPAL
NCA	NATIONAL COMMUNICATION AUTHORITY
NHIA	NATIONAL HEALTH INSURANCE AUTHORITY
NHIS	NATIONAL HEALTH INSURANCE SCHEME
PCA	PRINCIPAL COMPONENT ANALYSIS
PEOU	PERCEIVED EASE OF USE
PU	PERCEIVED USEFULNESS
SQ	SYSTEM QUALITY
TAM	TECHNOLOGY ACCEPTANCE MODEL
TC	TRANSACTION COST
TOE	TECHNOLOGY-ORGANIZATION-ENVIRONMENT
TRA	THEORY OF REASONED ACTION
WHO	WORLD HEALTH ORGANIZATION

ABSTRACT

Background: The National Health Insurance Authority in the past few years has introduced mobile phone renewal and premium payment services in an effort to increase enrollment. A social intervention program to make health care delivery affordable in Ghana. The success of this innovation are dependent on many factors. To be able to understand the factors Technology Acceptance Model (TAM) was examined to explain subscribers' intention to use the NHIS Mobile Renewal Service.

Methodology: The study adopted a cross-sectional survey using a quantitative approach to solicit the required information from about 211 respondents living in the Lower Manya Krobo Districts in the Eastern Region of Ghana. Ordinary Least Square (OLS) regression was employed to estimate the influencing factors of the intention to use mobile renewal service.

Findings: Results of the study provided significant results to confirmed that Technology Acceptance Model (TAM) is an acceptable theory that offer a practical description of a subscribers' intention to use and adoption of Mobile Renewal Service. The study reported T statistics greater than 1.96 and P-value less than 0.05 for all the independent variables except Transaction Cost (T statistics of 0.32 and P-value of 0.750) indicating that the independent variables, namely System Quality (T statistics of 3.83 and P-value of 0.01) , Accessibility (T statistics of 4.36 and P-value of 0.01), and Perceived Usefulness (T statistics of 3.06 and P-value of 0.01) have positive significant correlation correlation between the dependent intention to use the mobile renewal service.

Conclusion: It can be concluded that perceived usefulness, system quality and accessibility enables subscribers' intention to use the mobile renewal service. The result also concludes that Transactional cost is not an enabling factor for user's intention to use the service.

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CHAPTER 1

1.0 INTRODUCTION

1.1 BACKGROUND OF THE STUDY

An Act of Parliament (Act 650) created the National Health Insurance Scheme (NHIS) in August 2003 to provide all Ghanaians, regardless of their socioeconomic status, with financial access to affordable, basic healthcare (Wang et al., 2017). It is currently operating in 163 district offices all over the country. The total enrolled membership is about 12.1 million representing 41% of the population as of December 2019. There are currently about 4,600 healthcare facilities accredited to provide services to the insured (*NHIS - Your Access to Healthcare*, 2019)**.**

Previously, The NHIS authorized places and offices had to be visited in order to register or renew a membership, which came at a considerable cost to the member in terms of financial, time, and hassle. It is well-recognized that many variables influence NHIS enrollment. The quality of care provided in NHIS-accredited facilities, culture, an inequitable distribution of social infrastructure, and religion are some of the issues that research has found to impede enrollment expansion. Other factors include poverty and religion(Kotoh, Aryeetey and Van Der Geest, 2018; Bedzo, Chobbah and Manortey, 2020).

In December 2018, Ghana's National Health Insurance Authority (NHIA) implemented a cutting-edge mobile platform-based membership renewal and premium payment system into the National Health Insurance System (NHIS). The mobile money banking app is used by this technology to enable users to renew their subscription on any mobile money service. This innovative approach

is a component of the NHIS's dedication to fully digitizing enrollment and renewal processes (Boaheng *et al.,* 2019). Subscribers can benefit from this system to get notifications when it's time to renew their membership. In a bid to relieve the subscribers of the burden associated with devoting lengthy amounts of time to registration and renewal, mobile phone membership renewal was introduced. Using a mobile phone to renew a subscription and pay the premium is anticipated to make the process easier, increase enrollment, and increase membership retention. The electronic renewal system was tested in a district in each of the Northern and Eastern regions (Gurol-Urganci *et al.,* 2013).

Due to the rapid growth in mobile phone penetration, particularly in the Asia Pacific region, 90% of the world's population and 80% of the rural population had access to a cell phone in 2010 (Car *et al.,* 2012). Following an earlier survey in 2006 that claimed there were 2 billion memberships, the number of subscriptions reached 5.3 billion in that same year (Atun *et al.,* 2006). The above represents an adoption rate of 76.2% worldwide. With 50 million subscribers in the last ten years, the mobile phones demand in Africa is enormous and growing quickly (Aker and Mbiti, 2010). This represents 7% of the African region’s populace. According to Scott et al. (2004), the current figure is anticipated to expand significantly after 10 years through an annual growth rate of 35%.

The widespread use of mobile phones in Ghana has led to the consideration of mobile phones for NHIS membership renewal in Ghana. As of December 2017, 36.75 million active mobile phone chips were registered in Ghana, according to data made available by the country's National Communication Authority (NCA). With a population of roughly 28.83 million in 2017, this suggests that each Ghanaian owns 1.27 mobile phones on average. In both the formal and informal sectors, the population uses mobile phones extensively, which is predicted to rise. In 2020, the

population was expected to be 31 million, while there will be 40 million registered active mobile phones (Aker and Mbiti, 2010). According to data from the Bank of Ghana, more than 8 million active mobile money accounts (roughly 40% of the population) existed in Ghana as of 2016. (Bank of Ghana, 2017).

1.2 PROBLEM STATEMENT

Although the usage of mobile phones in the healthcare industry is not new, little research has been conducted to determine the aspects that contribute to their success. Previous research has demonstrated the important functions mobile phones have played in healthcare provision. Text message initiatives, for instance, have been used to increase adherence to medication and clinical appointments (Nsiah-Boateng and Aikins, 2018). Mobile phone use for financing healthcare was not a part of any of the aforementioned interventions. However, Ghana is not the first country to use mobile phones to renew health insurance coverage. Kenya has made a brave move by introducing the "M-Pesa" (Mobile Money Payment System) mobile phone platform to allow for monthly health insurance premium payments (The Kenya National Hospital Insurance Fund, 2010). The payment mechanism has grown in popularity among Kenya's National Health Insurance subscribers (The Kenya National Hospital Insurance Fund, 2010). Nevertheless, there has not been much research on its patronage.

In Ghana, mobile phone usage is well-thought-out as a path for renewing NHIS membership and premium payment. However, just as in Kenya, there has not been much study on the factors influencing the acceptance of mobile phone technology for the renewal of membership and payment of health insurance premiums. While some studies have identified characteristics of members as a vital influencer for the enlistment of the NHIS, this current study intends to look at

the characteristics that encourage the use of a mobile phone for the renewal of NHIS in the Lower Manya Krobo Municipality of the Eastern Region of Ghana.

1.3 RATIONALE OF THE STUDY

Many studies have been conducted regarding Ghana's national health insurance scheme, and most of these studies looked at the factors that influence enrollment and retention. Since the introduction of the Mobile Phone Renewal Service, there has been little research to find out factors that influence the use of mobile phone renewal of the NHIS, more so in any of the districts n the Krobo enclave.

Even though there has been an increase in the renewal service since the introduction and adoption of mobile phone renewal, many people continue to visit the NHIS offices to renew their service. Nevertheless, the main reason for the introduction of the mobile phone renewal service is to allow subscribers to renew their subscriptions from the comfort of their homes, offices, etc., without visiting the NHIS offices. This study, therefore, provided a platform for the NHIA to evaluate mobile phone renewal services and identify how to improve their general acceptability and use. This help NHIA to put in place procedures that can encourage a positive public perception of the service. This will make it easier for NHIS officers to focus on other very important aspects of the operations that improve the quality of their service. Another reason why the study is relevant is that it has identified possible solutions for improvements in mobile phone service delivery. Finally, the findings from this research also contributed significantly to scientific knowledge.

1.4 THEORETICAL FRAMEWORK

The Technology Acceptance Model (TAM) was employed in this study to investigate whether a person accepts and plans to use the Mobile Service Renewal in relation to extrinsic factors, such as system quality, transaction costs, and accessibility in addition to perceived use, perceived ease of use, and intention to use (Figure 1.1).

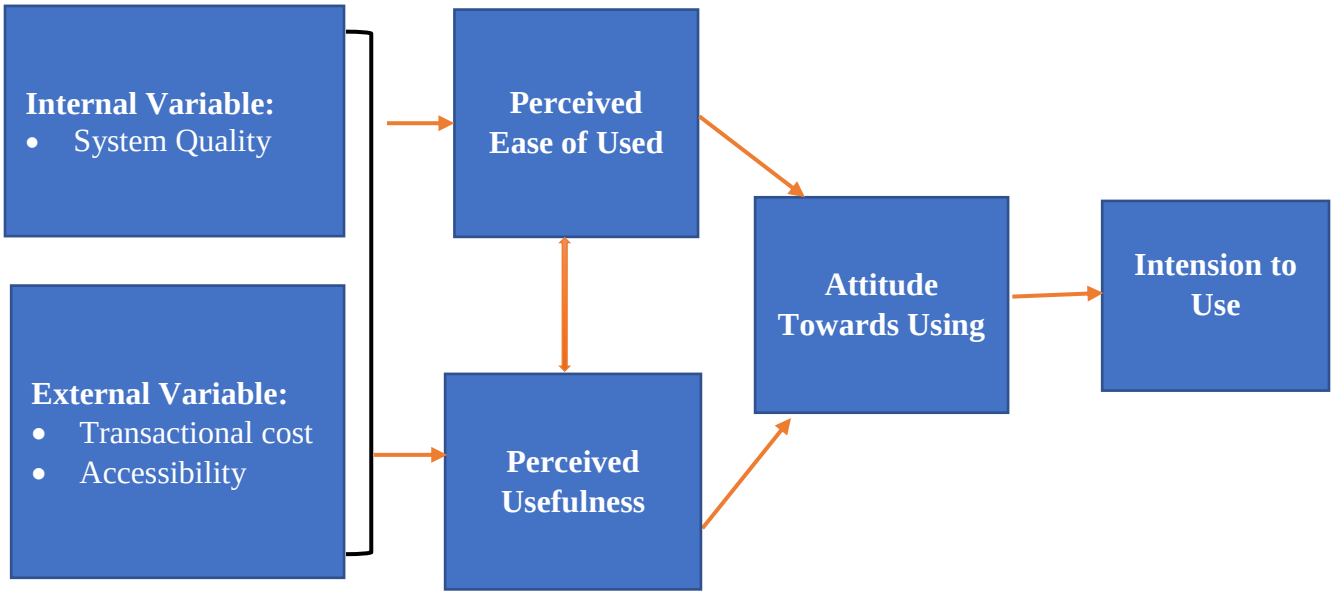

Figure 1.1: Modified technology acceptance model. Source: (Venkatesh and Davis, 2000a)**.**

System Quality

System quality is the assumption of how successfully a system achieves an action matched with work objectives (Davis & Venkatesh, 2000). It is anticipated that the survey could demonstrate that System Quality impacts customers' Intention to Use the Mobile Phone Renewal Service. Measuring generally focuses on estimating the system's performance qualities under consideration.

Transaction Cost

The financial burden of using the mobile renewal service may daunt many subscribers. Patrons are more likely to adopt and use a service if they perceive its transaction costs to be within their means. Previously, this indicator was applied in the M-banking adoption survey (Luarn & Lin, 2004).

Accessibility

Mobile Renewal services' physical and informational accessibility can significantly affect subscribers' Intention to Use them. Accessibility denotes a user's capability to reach the system's necessary hardware physically. The more user-friendly a system is, the less work is required to use it. (Davis, 1989).

Perceived Ease of Use, Perceived Usefulness, and Intention to Use

Both perceived benefit and perceived usability are perceptions. They will consequently affect the user's intentions. The intention of subscribers to use the mobile renewal service will also be somewhat influenced by perceived ease of use and perceived usefulness.

1.5 RESEARCH QUESTIONS

1. What effect does the system quality have on subscribers' use of the mobile phone renewal service?
2. What is the effect of transaction cost on members' use of mobile phone renewal service?
3. What is the effect of accessibility to mobile phones on subscribers' intention to use the mobile renewal service?

4. What effect perceived ease of use and perceived usefulness have on the intention of members to use mobile phone renewal services?

1.6 GENERAL OBJECTIVE

- To investigate the factors for adopting NHIS mobile renewal service within the Lower Manya Krobo Municipality of the Eastern Region of Ghana.

1.7 SPECIFIC OBJECTIVES

The study seeks to:

1. To assess System Quality and subscribers' intention to use mobile renewal service
2. To identify the effect of transaction cost on members' intention to use mobile renewal service
3. To determine if accessibility influences the intention to use mobile renewal service
4. To investigate if perceived ease of use and perceived usefulness influences intention to use mobile renewal service

1.8 PROFILE OF STUDY AREA.

The study took place in Lower Manya Krobo Municipality. The Lower Manya Krobo Municipal (LMKM) is one of the 33 administrative districts in the Eastern Region of Ghana, with Odumase-Krobo as its capital. Following the division of the former Manya Krobo District into Lower and Upper Manya Krobo in 2008, the municipality was established. Its North-East and South-East boundaries are Asuogyaman District to the, and North Tongu District to the , the North-West

by Upper Manya Krobo District, and the South by Yilo and Dangme West Districts. It covers a land area of about 591 km^2, constituting approximately 3.28% of the Eastern Region of Ghana. The municipality has a total population of around 89,246, or 3.4% of the population of the entire Eastern Region, according to the 2010 National Population and Housing Census Report. The residents of the area are primarily farmers and traders. This study's target population entailed insured and non-insured members aged 18 years and above. The age restriction was introduced because purchasing health insurance is possible only when one is 18 years and above. Those below the age of 18 years are classified as dependents. Such persons depend on their parents' or guardians' health insurance policies (Ghana Statistical Service, 2014).

1.9 SCOPE OF STUDY

This project examined the predictors of mobile technology adoption of NHIS renewal service in the Lower Manya Krobo Municipality in the Eastern Region of Ghana. It focused on four objectives, including the effect of the system quality on subscribers' use of the mobile renewal service, the influence of transaction cost on member's use of mobile phone renewal service, access to mobile phones, and its impact on the intention of the subscriber to utilize the mobile renewal service and the perceived ease of use and perceived usefulness on the intention to use mobile phone renewal service in the Lower Manya Krobo Municipality.

1.10 ORGANIZATION OF REPORT

The study is set up in the structure described below and is divided into six chapters.

Chapter One: Introduction - This chapter explains the research and gives background data on the use of mobile technology in NHIS renewals. Additionally, it highlighted the study objective, problem statements, significance, and defined research questions.

Chapter Two: Literature Review - This chapter provides background information on the literature on innovation adoption before discussing diffusion research and the stages of innovation adoption. It also explains the theoretical framework for this study. The Diffusion of Innovation (DOI), Technology Acceptance Model (TAM), and Technology-Organization-Environment (TOE) frameworks are then discussed in order to create the research model for this study.

Chapter Three: Methodology - This chapter details the methodology, the process by which The research model was scientifically evaluated, and research questions were addressed. The following is a discussion of the approach chosen to achieve the research objectives of this thesis: A description of the research design is provided, followed by a summary of the sample and data collection procedures, and concluding with data analysis.

Chapter Four: Results - his chapter presents the outcomes of data analysis, including data inspection, cleansing, transformation, and modelling. The objective of the data analysis is to gather enough statistical data to respond to the study's research questions. This chapter presents the preliminary investigation and descriptive statistics.

Chapter Five: Discussion - This presents the results and discusses each factor identified in this study to the research questions, objectives, key variables, and literature review while citing appropriate references.

Chapter Six: Conclusions and Recommendations - This chapter summarizes the study's findings and analyses. The National Health Insurance Authority is also given recommendations for strengthening mobile renewal services. Finally, the limitations of the study and some options for future research are discussed.

CHAPTER 2

2.0 LITERATURE REVIEW

2.1 INTRODUCTION

This section discusses the theoretical underpinning for the research by introducing the innovation adoption literature, diffusion research, and innovation adoption stages. Examining the Diffusion of Innovation (DOI) and the Technology Acceptance Model (TAM). The chapter then elaborates on how these models can be used to understand individual adoption and presents a rough research model. This model is developed further by talking about the pertinent idea of e-service, which is using information and communication technology to deliver high-quality healthcare to the general public. The World Health Organization (WHO) describes e-health as "the cost-effective and secure use of information and communication technologies (ICTs) for health and related sectors." As a developing nation, Ghana is constructing a comprehensive, cutting-edge health ICT platform and issuing patient-specific identification numbers. In Ghana, over 22 eHealth initiatives are in different phases of completion (Afarikumah, 2014). Robert Istephanie coined the term mHealth in 2005 to symbolize the “emerging healthcare mobile communications and network technologies”(Istepanian, Laxminarayan and Pattichis, 2007). The World Health Organization defines mHealth as a medical practice assisted by mobile devices. Research on the implementation of mobile health care is still in its infancy. Evaluating the Mobile Renewal Service's present state and acceptability is essential.

2.2 BACKGROUND ON INNOVATION ADOPTION

Innovation may be defined as a novel concept, product, program, or technology adopted by an entity (Premkumar and Roberts, 1999). Numerous disciplines, including public health, economics, management, education, sociology, organizational studies, and information technology, have conducted substantial research on innovation. Notwithstanding the diversity of these disciplines, they share an interest in three fundamental research problems, one of which this study aims to address: "What ultimately decides an individual's susceptibility to embrace a particular innovation?" (Fichman and Kemerer, 1999).

An innovation may already exist, but if an organization presents it to its customers in a manner regarded as novel, it could still be an innovation for them. For innovation, adoption characteristics are more closely associated with the three innovation-decision process steps (knowledge, persuasion, and decision). A significant hurdle to the acceptance of technologies is a lack of certainty. "Consequences are the changes that occur in an individual or a societal system as a result of the adoption or rejection of an innovation" may generate ambiguity (Rodgers, 2003). Individuals should be educated on the advantages and drawbacks of the invention so that they are conscious of its repercussions to reduce the uncertainties associated with embracing it. In addition, according to Rogers, repercussions can be categorized as acceptable vs undesired (functional versus dysfunctional), direct versus indirect (immediate result or effect of the immediate result), and anticipated versus unanticipated (recognized and intended or not).

2.3 DIFFUSION OF INNOVATION THEORY

When bringing innovation into a society, it is important to comprehend how the diffusion of innovation will unfold over time. A new system of renewing NHIS, health practices, and initiatives is not immediately embraced by the priority population, much like individual behaviour change.

They adopt them in predictable stages, and the factors influencing adoption at certain stages also frequently follow patterns. The diffusion of innovation theory is one hypothesis that aims to simulate how populations and organizations change (Rogers, 1995). The hypothesis was initially devised to explain why some technological innovations, like the use of contraception, are adopted by individuals. The best framework for analyzing the uptake of mobile renewal of NHIS is Rogers' diffusion of innovations theory (Parisot, 1995; Medlin, 2001). Rodgers (2003) frequently used the terms "technology" and "innovation" as equivalent phrases because diffusion research frequently examines technical innovations. According to Rogers, technology is a plan for adaptation and mitigation action that reduces ambiguity in the essential cause-and-effect relationships to achieve the desired outcome.

Early formulations recognized the involvement of many adopter clusters in the innovation process. The characteristics of the aforementioned invention that influenced the patterns of acceptance are also included in these clusters of adopters, along with early adopters, early majority, late majority, and laggards. For instance, innovations highly compatible with current practices are more quickly adopted, and early adopters typically have a risk-taking attitude. Although the change process in companies generally is more complicated due to ingrained bureaucratic and decision-making systems, stages of change comparable to those in individual innovation have been identified. According to one definition, the steps proceed in a pattern of institutionalization, adoption, implementation, maintenance, and dissemination (Rodgers, 2003). For instance, the NHIA might consider implementing a harmonized initiative to reduce the duration between subscription renewals. They may also disseminate information about the program to its subscribers and invite some subscribers to participate in a pilot project. Impressive outcomes from the pilot's first year of operation could drive more customers to sign up for the program in the coming years. If the

program continues to be successful and has the support of all stakeholders, it may eventually be institutionalized across the country.

2.4 TECHNOLOGY ACCEPTANCE MODEL

Davis created the Technology Acceptance Model (TAM) in 1989 (Davis, 1989). One of the hypotheses about how technology is used is most frequently explored. This theoretical framework was developed by Davis (1989) to anticipate and categorize ICT use behaviours. TAM suggests that if technology is perceived as useful and user-friendly, people will embrace it and use it. Consequently, individuals are more persuaded to adopt new technology and see its benefits more frequently concur that a system may make their tasks easier to execute (Dillon and Morris, 1996). TAM is modelled on Davis' original Theory of Reasoned Action (TRA) proposal (Ajzen & Fishbein, 1980). According to the TRA, people's attitude toward information affects their social behaviour (Lin, 2007).

Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) are two theoretical factors in TAM that are primary determinants of system utilisation and influence attitudes towards using the system, i.e. the subscriber's enthusiasm to use the technology. The phrase "the degree to which a person feels that utilizing a specific system would boost his or her job performance" describes perceived usefulness. In contrast, "the degree to which a person believes that using a particular system would be free of effort" explains perceived usability (Davis, 1989).

Adding to the initial TAM research findings, Davis, Bagozzi, and Warshaw (1992) proposed that internal and extrinsic motives can influence a user's desire to embrace new technology. The motivation theory states that both inner and extrinsic incentives drive consumer behaviour. Intrinsic motivations are the feelings of pleasure and satisfaction obtained from engaging in the

conduct itself. In contrast, extrinsic motivations are the drive to engage in a behaviour to accomplish certain goals or rewards (Deci and Ryan, 1985). Previous literature provides strong support for the distinction between hedonistic (intrinsic) and utilitarian (extrinsic) incentives (Childers *et al.,* 2001). People are driven by adoption's practical benefits, enabling them to do their duties with the least effort (Jones, Reynolds, and Arnold, 2006). Additionally, they are motivated by adoption's hedonistic components, which pertain to enjoyment and playfulness rather than job accomplishment (Hirschman and Holbrook, 1982).

According to a study by Davis, Bagozzi, and Warshaw, (1992), "Extrinsic motivation signifies the performance of an action because it is thought to be crucial in achieving desired results that are independent of the action itself. Furthermore, intrinsic motivation in this study refers to finishing a task for no apparent reward other than the act of doing the activity". This study implies that PEOU might indirectly influence innovation adoption through its impact on PU since an easier-to-use system can be more beneficial (Venkatesh and Davis, 2000a).

These notions of PU and PEOU moderate the influence of various exogenous factors used to research how they affect behaviour intention (Davis, 1989). The PU concept captures extrinsic incentive in TAM (Davis, 1989; Venkatesh and Davis, 2000b) which relates to time-saving and adoption efficiency and hence captures extrinsic incentive (Childers *et al.,* 2001). But according to the majority of TAM researchers, PEOU, which Childers *et al., (*2001), state that intrinsic motives are not sufficiently accounted for in the outcome-generating process (Davis, Bagozzi, and Warshaw, 1992; Pavlou, 2003; Perea Y Monsuwé, Dellaert and De Ruyter, 2004). The "perceived enjoyment" concept has been studied further in TAM studies to capture the pleasure and satisfaction obtained from engaging in a behaviour and its impact on use intention.

Furthermore, several external factors may have an impact on PU and PEOU. A person's traits, system features, and the context in which the system is used are examples of external influences (Wojciechowski and Cellary, 2013). Behavioural intention (BI) is defined by Ajzen and Fishbein, (1975) and Davis and Cosenza, (1996) as the goals, aspirations, and anticipated responses to the attitude object. Even though TAM is frequently used to gauge user acceptability of technology, Lule and Mwololo Waema (2012) argue that TAM is inappropriate for companies' usage. The TAM model has helped academics embrace and employ technology despite its drawbacks. TAM has been used in various technologies, including mobile delivery apps and medical information systems. It has accurately predicted IS adoption trends across multiple technologies and situations (Jaradat, 2013).

2.5 FACTORS INFLUENCING SUBSCRIBER USE AND ADOPTION OF A NEW HEALTH SYSTEM

Employing a questionnaire survey and a log file analysis, Kim *et al.*, (2016) studied the factors that influence users' intents to use a mobile electronic health records system. The results show that attitudes and intentions to use the system are influenced by performance expectations and attitudes, respectively (Kim *et al.,* 2016). The study concludes that a significant portion of people will want to implement clinical information systems. The results add to the body of literature by replicating, outlining, and extending the TAM, and by strengthening the theory through the inclusion of outside variables and a moderator. To confirm the effective implementation of new health technologies, Safi, Thiessen, and Schmailzl (2018) aim to identify and evaluate the elements that influence acceptance and resistance in order to assure the successful deployment of innovative health technology. The target audience includes Brandenburg's patients as well as key figures in the region's healthcare system. Basak and Calisir (2015) look into what influences doctors' decisions

to employ personal digital assistants. In part, physicians' intentions to utilize personal digital assistant technology were driven by their perceptions of its usefulness and usability (71%). The data was gathered from 339 Turkish doctors. Ifinedo (2015) examined the controlling effects of demographic factors (such as age and educational attainment) and personal traits on nurses' use of information systems. The results were unaffected by the nurses' age or years of nursing experience.

Our understanding of the relative importance of various belief constructs in influencing IT acceptance behavior is improved by studies that examine additional belief constructs in addition to the general PU and PEOU belief conceptual frameworks, such as perceived risks, perceived enjoyment, perceived access barriers, perceived behavioural control, and perceived innovativeness. Because research on IT adoption literature have shown empirical backing for it, TAM is the most influential model with wider appeal among those that have been extended.

2.5.1. **System Quality**.

Traditionally, dimensions of system quality consist of usability, availability, reliability, adaptability, accessibility, responsiveness, and flexibility (H. and R., 2003; Petter, DeLone and McLean, 2008; Chen and Cheng, 2009). However, customers have become increasingly sophisticated and seek more than an innovation's reliability, responsiveness, and flexibility. Many authors have developed multiple dimensions of system quality which have contributed to literature and added to the recent body of knowledge on other dimensions of system quality.

Trust in the mobile application is seen as an inherent mindset of a user that is highly subjective and can be difficult to measure (Yan *et al.,* 2013). Users' trust in a mobile application can be developed during the use of the mobile application by observing its operational outcomes (Yan *et al.,* 2013). According to Chiang and Liao (2012), consumers build trust and are more comfortable

making transactions on a mobile system that is believed to be of high quality. Trust involves a certain degree of taking risks, which creates a sense of vulnerability in a customer to the mobile system operator (Chinomona and Sandada, 2013). Many scholars believe that trust is built gradually, grounded on positive outcomes, and if there are uncertainties about a mobile system and the consumer, the chances of the user establishing long-term relations with the mobile site would be low (Chiu *et al.,* 2012).

Satisfaction is defined as a pleasant or disappointing status formed by customers after comparing a product's or service's perceived actual results with the expected one (Taha *et al.,* 2013). If the perceived consequences are lower than the expected ones, a customer's feelings of dissatisfaction will intensify. Because of mobile commerce's short history, mobile satisfaction has rarely been given much consideration. Many researchers pay more attention to the customer's reasons for accepting mobile commerce than what it is about the mobile system that would lead to customer satisfaction (Taha *et al.,* 2013).

User satisfaction has been prominently used as a measure for information systems (Chung and Kwon, 2009). Many academics allude to the fact that satisfaction with mobile technology is highly dependent on performance that adds social, emotional, and conditional value (Varnali and Toker, 2010).

2.5.2. Transaction cost

An overriding predictor of consumers' willingness to adopt a technology may also be the expense associated with its adoption and usage. These expenses, which the user of new technology must pay, might be direct or indirect and include transportation costs, membership fees, transaction costs, replacement costs, etc. For many mobile technologies, deploying NHIS mobile renewal

technology typically comes with some ancillary charges, like user fees. People's readiness to switch to mobile renewal services for NHIS will be curtailed if they believe that doing so will be more expensive than using the current system to renew their subscription. Numerous research confirms that perceived costs may hinder the adoption of mobile technologies in service delivery (Luarn and Lin, 2005; Dahlberg *et al.,* 2008; Hanafizadeh *et al.,* 2014). According to Mathieson, (1991), studies on innovation acceptability frequently centre on economic drivers and results.

In more recent work on the utility aspect of the diffusion of innovations, David-West, Oni, and Ashiru, (2021) have emphasized the significance of researching innovations' perceived qualities and benefits. According to this hypothesis, people who see the most usefulness in innovation should adopt it more quickly than others, all other things being equal (Mahajan, Muller and Srivastava, 1990). The idea behind this anticipatory identification of an adopter is that adoption must occur when the perceived benefits outweigh the costs, the potential adopter has a relatively high awareness of the innovation and its attributes, the innovation is relevant to the needs of the potential adopter, and the situational factors that intervene between awareness and adoption are favourable.

2.5.3. Perceived ease of use and perceived usefulness,

The Technology Acceptance Model (TAM) and Diffusion of Innovation Theory (DOI) have been the most frequently applied among the various theoretical frameworks that examine the acceptance of innovation. However, most studies conducted in mHealth literature have repeatedly used the TAM framework to describe the key variables that predetermine users' inclination to use mobile technology (Luarn and Lin, 2005; Koenig-Lewis, Palmer and Moll, 2010; Tobbin, 2012). The Theory of Planned Behavior (TPB) and the Theory of Reasoned Action (TRA) are the sources of TAM, as was first proposed by Fred Davis (Davis, 1989). The hypothesis postulated that two

beliefs—"perceived utility" and "perceived ease of use"—explain why people intend to accept and employ innovation or technology (Davis, 1989). In light of this, the TAM views an innovation's and technology's usability and simplicity as determinants of an individual's intention to use and embrace it.

When the email system and a file editor application were examined, Davis, (1989) discovered that PEOU and PU were highly connected to self-reported use of both systems. However, subsequent research of 40 students pursuing a master's degree in business administration revealed that only PU could predict students' propensity to use the system (Gefen and Straub, 2000). Since then, TAM has been widely used in numerous contexts and cultures. PU has repeatedly been observed to have a direct impact on the behavioural intention to use in the majority of investigations evaluating the nature and relationship of PU and PEOU to behavioural intention (Mathieson, 1991; Adams, Nelson, and Todd, 1992; Hendrickson, Massey and Cronan, 1993; Straub, Limayem and Karahanna-Evaristo, 1995; Karahanna and Straub, 1999; Gefen and Straub, 2000). However, few research has discovered that PEOU directly impacted behavioural intention to use in addition to PU (Moore and Benbasat, 1991; Barclay, D., Thompson, R., dan Higgins, 1995; Chin and Gopal, 1995; Venkatesh, 1999). Gefen and Straub, (2000) drew attention to the PEOU's inconsistent relationship with its association to usage behavior. The intrinsic and extrinsic aspects of tasks related to information technology were used to explain the contradiction. According to the study's findings, the task type appears to determine whether PEOU has a direct impact on use intention. Adopter; therefore, the situational elements that intervene between awareness and adoption must be favorable.

CHAPTER 3

3.0 METHODOLOGY

3.1 STUDY METHODS AND DESIGN

A cross-sectional design and a quantitative data-gathering strategy were used in this research. Using questionnaires to assess the variables that might affect paying health insurance premiums via the Mobile Phone Payment System does its quantitative analysis. A cross-sectional study is observational research examining data on variables gathered across a sample population at one particular period in time.

3.2 DATA COLLECTION METHODS AND INSTRUMENTS

A carefully constructed questionnaire was used to gather the data. The poll asked respondents about their use of the NHIS and their status concerning renewal. A cross-check was made between this and the participants' NHIS cards, if possible. The questionnaire's objectives were to gather data on the individuals' sociodemographic traits, their awareness of the NHIS mobile renewal service, the variables that influenced their use of the service, and any issues they encountered. Field assistants who had received training on the purpose of the study, obtaining consent, and gathering quantitative data gave the questionnaire. Based on the percentage of the renewal pattern, the information was collected from the districts. Each responder was given a brief explanation of the study's objectives, and the researcher promised them that the data they provided would be kept private. A consent document was given out, and those who agreed to participate were asked to

either sign it or thumbprint it. The accuracy of the data was verified for each completed questionnaire.

3.3 STUDY POPULATION

The study was conducted among adults between 18 to 69 years of age in Lower Manya districts in the Eastern Region of Ghana who enrolled on NHIS and consented to participate in the research.

3.4 STUDY VARIABLES

INCLUSION CRITERIA

- Residents of Lower Manya Municipality who are between 18 to 69 years of age
- Residents who are enrolled on the NHIS for at least 2 years
- Residents who have consented to be enrolled in the study
- Residents who are of a sound and stable mental condition at the time of enrollment
- Residents who have lived in the Municipal for more than a year.

EXCLUSION CRITERIA

- Residents of Lower Manya Municipality who are below 18 and above 69 years of age
- Residents who are not enrolled on the NHIS for at least 2 years
- Residents who have not consented to be enrolled in the study
- Residents who are not of a sound and stable mental condition at the time of enrollment
- Residents who do not live in the Municipal for more than a year.

3.5 SAMPLE SIZE AND SAMPLING

Sampling is inevitable in research because time and financial restrictions make it impractical to survey the whole target population. A study's sample is a population unit whose features are examined to learn more about the population. It is a sample drawn to make inferences about the general population. A sample of about 211 subscribers within the Districts was selected using a Simple Random Sampling technique. The list of NHIS subscribers within the municipality was collected from the NHIS district office. Random Number Function (RAND) in Microsoft Excel was used to generate 211 random subscribers from the total mobile renewals of 48,639. Questionnaires were electronically forwarded to them after a call was placed to them. These are an excellent representation of the group under investigation, whose attitudes and views influence whether they will embrace and use the Mobile Renewal Service. The sample size must, therefore, correctly reflect the entire population.

The sample size was established using Cochran's formula for the determination of a single pro

$$n = \left[Z^2 \quad \times \quad \frac{pq}{e^2} \right]$$

where;

z = value is taken as 1.96;

p = the ratio of mobile renewals to total renewals (85.3%) at Manya Krobo NHIS (National Health Insurance Scheme, 2020).

q = the proportion of non-mobile renewal service usage;

e = the margin of error of estimation was assumed to be 5% or 0.05;

n = is the estimated sample size.

Hence,

$$n = (1.96)^2 \times \frac{(0.863 \times (0.147)}{(0.05)^2} = 193$$

This gave a sample size of 193 people. And with a 10% non-response rate, 211 subjects were determined to be the final sample size.

3.6 PRE-TESTING

The questionnaires for the survey adopted from similar research done in the Northern Region of Ghana by Amma Addae-Nketiah, which she developed based on a voluminous body of research on the variables impacting subscribers' use and uptake of the mobile renewal service (Addae-Nketiah, 2022). 16 % of the sample size participated in a pre-test of the questionnaire (40 NHIS card-bearing members who have renewed their cards outside the two districts but close to the study area- Yilo district). Before the actual data collecting began, in comparable regions, modifications were made later to enhance the clarity of some items.

3.7 DATA HANDLING

The data were checked for consistency and code And keyed into Microsoft Excel Spreadsheet 2019 for analysis. The primary investigator was responsible for data handling. Data collected with questionnaires were assessed for completeness and errors. All data sets and work were uploaded to the primary investigator’s google drive account and external drive. The completed questionnaires were kept in a fireproof cabinet to protect the data.

3.8 STATISTICAL ANALYSIS

The researcher used the STATA statistical program to enter, process, and evaluate the pertinent data after collecting it from the participants (StataCorp.2007. Stata Statistical Software. Release

17. StataCorp LP, College Station, n, TX, USA). The analysis used tables, graphs, and charts for descriptive and inferential statistical analysis. The demographic profile of the participants, the current situation, the level of subscriber acceptability, and the intention to utilize the service were determined using the descriptive statistics of frequency distributions and means scores-standard deviation procedures.

3.9 ETHICAL CONSIDERATIONS

In cases where research entails gathering data on specific persons, privacy should be preserved by assuring confidentiality. Ethics are standards of proper behaviour (Mahmoud and Mohamed, 2004).

Consent, secrecy, and participant inconvenience are ethical dilemmas we must deal with in data collection. The Ensign Global College Ethical Review Committee approved before the study started. Additionally, NHIA administrative approval was requested to use NHIS subscribers. Before beginning the exercise, each participant was asked to complete an oral informed consent form after hearing about the study's goal. Participants also provided a consent form that was signed. They were informed of the study's objectives and assurances regarding the confidentiality and anonymity of all data collected. Participants were assured that they were free to leave the study at any moment without suffering negative effects on their reputation or self-worth.

3.10 LIMITATIONS OF THE STUDY

The Lower Manya Krobo Municipality served as the sole focus of this study. The participants' willingness to share their experiences with implementing mobile renewal services for the NHIS further restricted the research. The study conveys the perspectives of the study's participants. The

study's conclusions were based on the sentiments and ideas of the study participants, assuming they were being genuine.

3.11 ASSUMPTIONS

To examine the factors that influence a subscriber's adoption of mobile technology for the renewal of their subscription, the study established the following assumptions:

1. Accessibility has a sizable beneficial impact on users' intentions to utilize the mobile renewal service.
2. The perception of ease of use directly influences whether or not a person plans to utilize the mobile renewal service.
3. Perceived simplicity of use has a considerable favourable impact on perceived usefulness.
4. The desire to use the mobile renewal service correlates with perceived usefulness.
5. A strong association between perceived ease of use and intention to use is considerably mediated by perceived usefulness.
6. There is a strong correlation between system quality and use intention.
7. By promoting and preventing the dissemination and adoption process and the desire to use, transaction costs might impact an individual's propensity to adopt innovation.

CHAPTER 4

4.0 RESULTS

4.1 INTRODUCTION

This chapter is organized around the study's objective and focuses on the outcomes of the data analyses. A total of two hundred and eleven (211) questionnaires were distributed, and all of them were collected and used in the data analysis. The analysis's legitimate surveys received a 100% response rate. This shows a very large response, which is consistent with the opinions of the entire research population. Demographic questions about the respondent's gender, age, education, and job status were also included.

4.2 DEMOGRAPHIC PROFILE OF RESPONDENTS

This presents the respondents' background information results to investigate the adoption of mobile renewal services under the NHIS. Table 4.1 indicates the findings on the socio-demographic features of the participants of the study. Relating to gender, the results suggest that 55 per cent and 45 per cent of the respondents were males and females, respectively. Regarding age group distribution, it was realized that most respondents are between the ages of 20 to 49. About 4 per cent of the respondents assert that they are less than 20 years of age. While 38 per cent, however, are between the ages of 20-29. The educational information of the respondents was also sought. Table 4.1 shows that many of the respondents making up 46.92 per cent, are senior high school graduates and 32.23 per cent of them said they have no educational background. 9.48 per cent hold a bachelor's degree. The finding indicates that most participants possess basic or no academic qualifications. Regarding employment status, 56.4 per cent of respondents, 56.4 per cent, claimed they are employed either in the private sector (29.4 per cent) or in the public sector (27

per cent). However, 92 respondents declare that they are unemployed, making up 43.6 per cent of the total.

Table 4.1: Respondent demographics

Characteristics		Frequency	
		n =211	Per cent
Gender	Male	116	55
	Female	95	45
Age	Less than 20	8	3.8
	20 - 29 years	81	38.4
	30 - 39 years	68	32.2
	40 - 49 years	37	17.5
	50 years and above	17	8.1
Education Attainment	No education	68	32.23
	High School	99	46.92
	Diploma	18	8.53
	Bachelor	20	9.48
	Masters	5	2.37
	Professional Certificate	1	0.47
Employment	Private Sector	62	29.4
	Public Sector	57	27
	Unemployed	92	43.6

Source: Author's construct (2022).

4.2.1. Years of National Health Insurance Scheme subscription

How long subscribers have been with the NHIS is important in this study. For that reason, respondents were asked how long they had been with the NHIS. Figure 4.1 shows that the majority (50.7 per cent) said they have been with the scheme between 10 to 15 years, while 16.6 per cent indicated they have been with NHIS for 5 years and below.

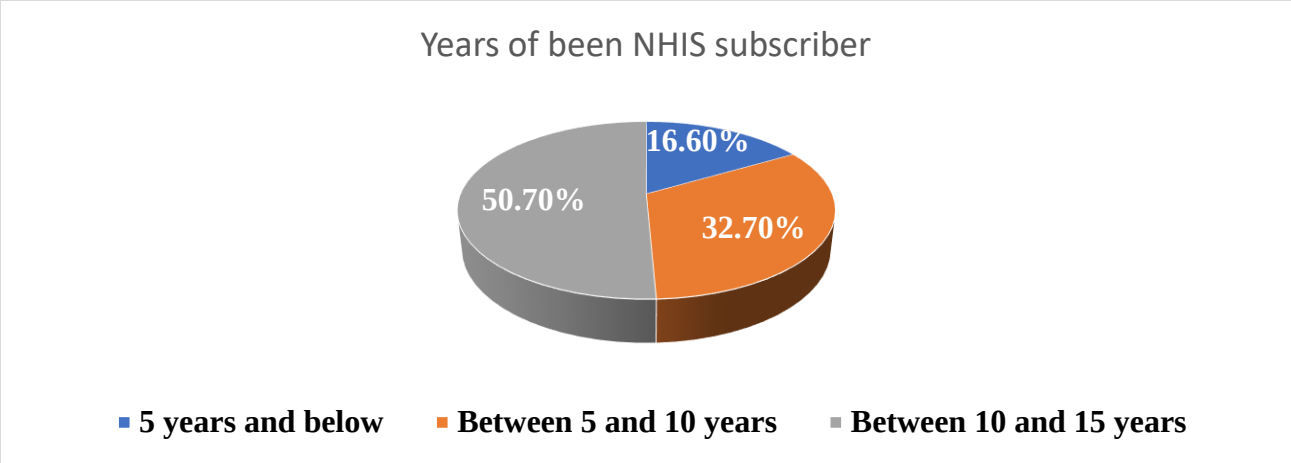

Figure 4.1: *Years of National Health Insurance Scheme subscription*

Source: Author's construct (2022).

4.2.2. Access to healthcare under NHIS

Respondents were required to indicate if they have access to healthcare under the NHIS. From figure 4.2 below, the general response was favourable towards the 'Yes', with 89.1 per cent of the respondents indicating they access healthcare under NHIS.

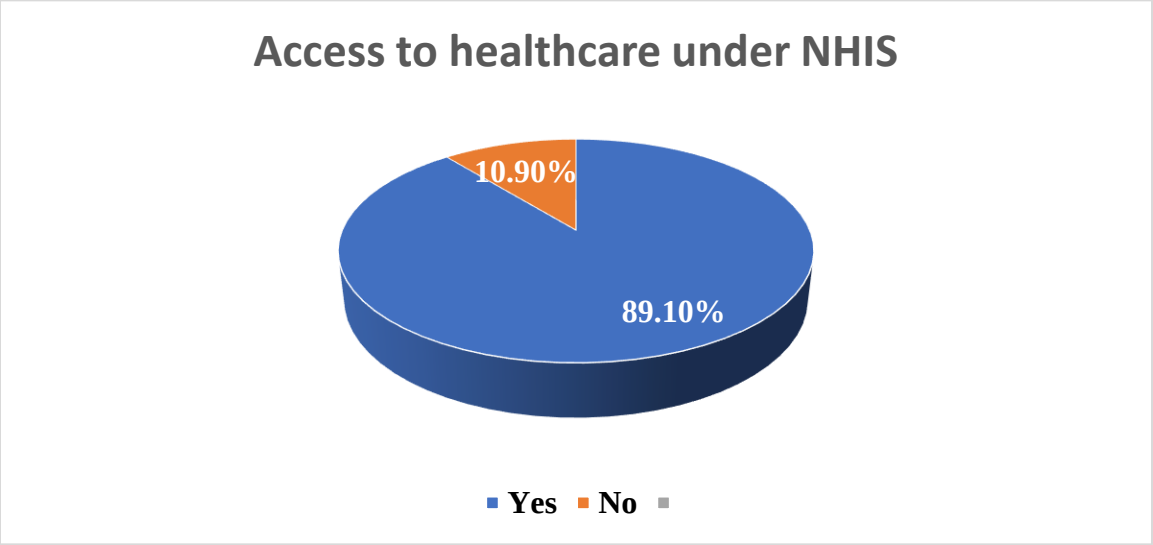

Figure 4.2: *Access to healthcare under NHIS*

Source: Author's construct (2022).

4.2.3. Quality of healthcare delivery under NHIS

The study sought to know how the respondents rank the quality of healthcare delivery under the NHIS. The response shows that the majority of the respondents representing 30.8 per cent, 26.1 per cent and 19.4 per cent, indicate that healthcare delivery under the NHIS is 'Good', 'Very Good, and 'Moderate, respectively.

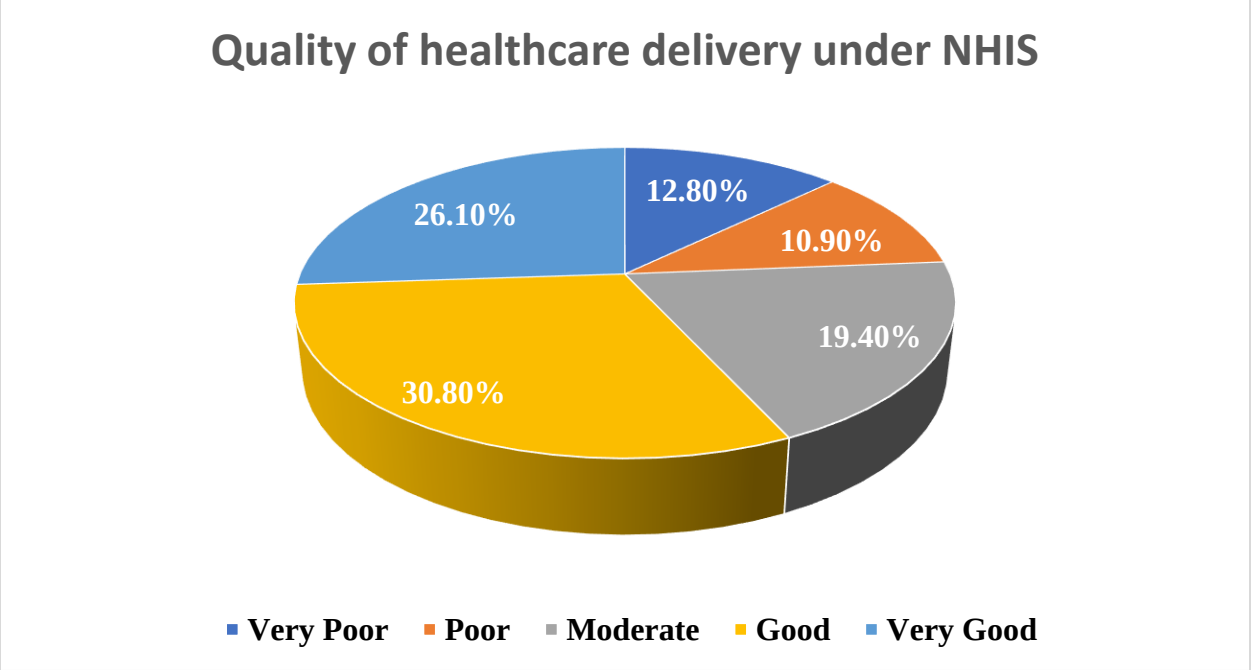

Figure 4.3: *Quality of healthcare delivery under NHIS*

Source: Author's construct (2022).

4.2.4. Knowledge of NHIS mobile renewal service

The study also wanted to know if the respondents knew about the NHIS mobile renewal service. The response indicated in figure 4.4 shows that the majority representing 84.4 per cent of the respondents have had some knowledge about the mobile renewal service.

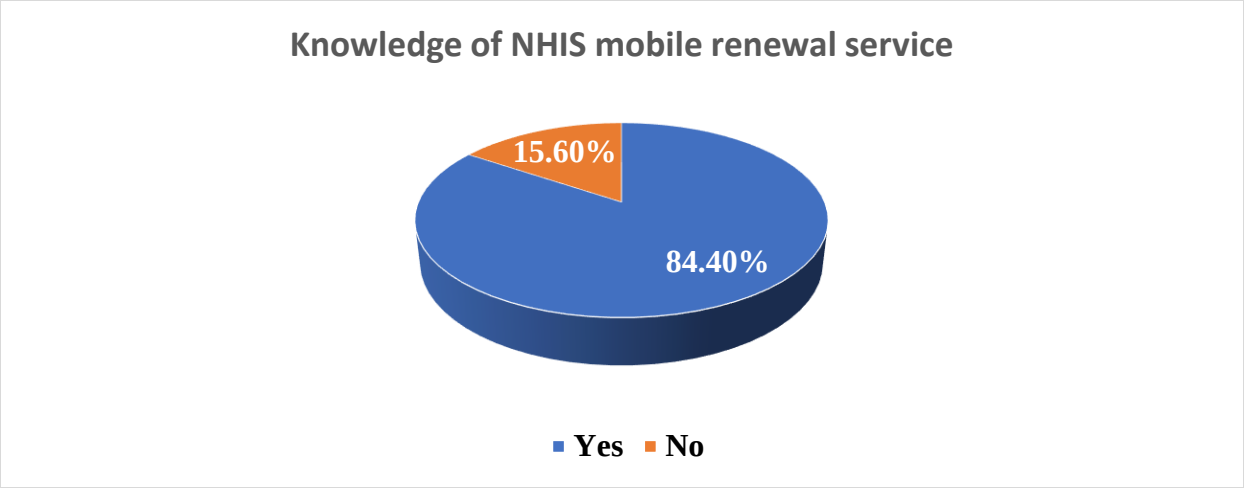

Figure 4.4: *Knowledge of NHIS mobile renewal service*

Source: Author's construct (2022).

4.2.5. Usage of mobile renewal service

The respondents were asked if they had ever used the mobile renewal service. The response reflects that, out of the 178 respondents who admitted having had some knowledge of the mobile renewal service, there were 76.3 per cent of them said they had ever used the mobile renewal service

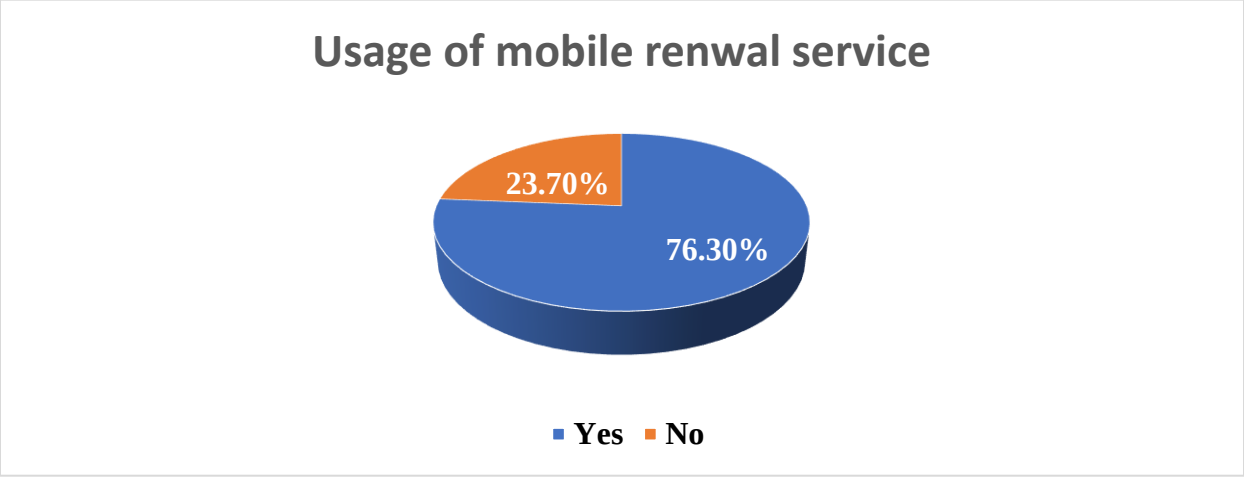

Figure 4.5: *Usage of mobile renewal service*

Source: Author's construct (2022).

4.2.6. Mobile renewal service quality

Respondents were asked to rank the mobile renewal service quality from very poor to very good to examine the service quality further. The response obtained was generally optimistic. It was the view of 70 (33.2 per cent) respondents that the service is very good. Significantly following this, 53 (25.1 per cent) respondents asserted that the service is good. 42 (19.9 per cent) respondents avowed that the service is moderate.

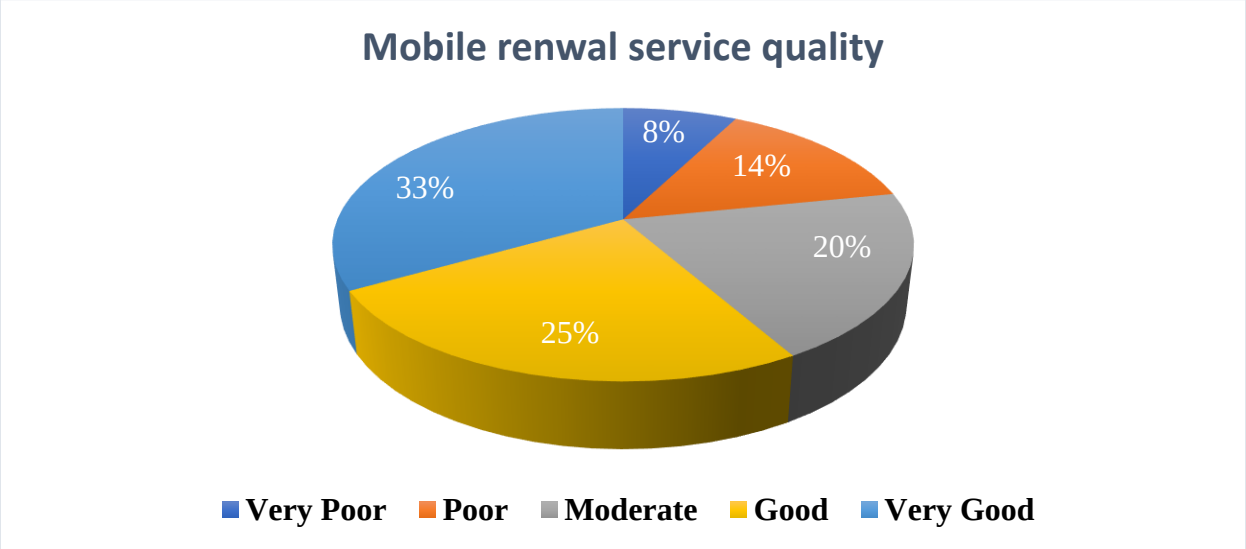

Figure 4.6: *Mobile renewal service quality*

Source: Author's construct (2022).

4.2.7. Continuation of mobile renewal service or not

Having observed the above response, the participants in the survey were required to indicate if they agreed that the Mobile Renewal Service should be continued or suspended. The answer obtained generally showed that the respondents considered the mobile renewal service good and wanted the service to continue fully functioning. The details show that majority making up 186 (88.2%) respondents thought the service would continue.

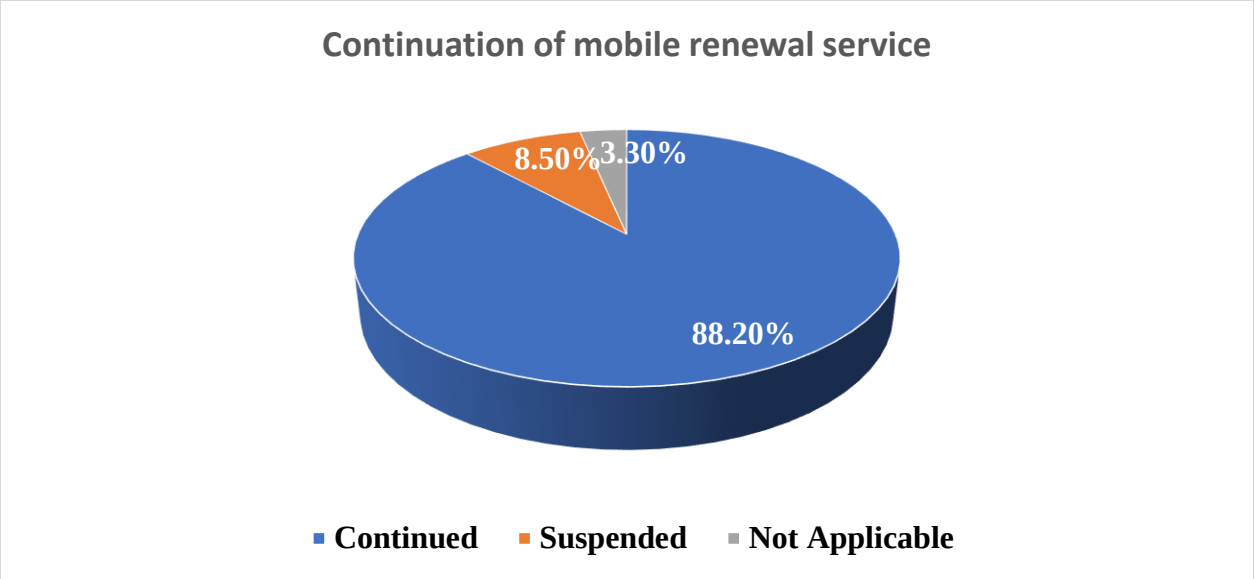

Figure 4.7: *Continuation of mobile renewal service or not*

Source: Author's construct (2022).

4.3 DESCRIPTIVE STATISTICS OF OTHER VARIABLES

The study employed 24 indicators in developing the questionnaire. The indicators were assessed for their mean scores and standard deviations. These descriptive statistics were presented for the assessment of the indicators. From Table 4.2, the minimum value on the scale is 1, which stands for strongly agree, and the maximum is 5 representing strongly disagree. The mean score from the analysis range from 2.20 to 2.66 for all indicators, as shown in the table. This indicates that, on average, the respondents agree with all the indicators under the constructs: perceived usefulness, perceived ease of use; intention to use; system quality; transactional cost; accessibility and trust. The Standard deviation measures the variation from the mean. The findings present a value between 0.95 to 1.20, which indicates that the variation from the mean is relatively spread out over a large range of values which could lead to an outlier situation.

Table 4.2: Descriptive statistics of other variables.

Variable	Obs	Mean	Std. Dev.	Min	Max
MRS = Fast renew (PU1)	211	2.203791	1.142756	1	5
MRS = Saving time and resources (PU2)	211	2.241706	1.139492	1	5
MRS = Effectiveness (PU3)	211	2.379147	1.202514	1	5
MRS = Productivity in healthcare delivery (PU4)	211	2.383886	1.068834	1	5
MRS = Easy to use (PEOU1)	211	2.322275	1.104289	1	5
MRS = Easy to learn (PEOU2)	211	2.450237	1.073995	1	5
MRS = Lot of mental effort (PEOU3)	211	2.597156	1.135485	1	5
MRS = Clear and understandable (PEOU4)	211	2.345972	1.05502	1	5
Use MRS to renew my health insurance (IU1)	211	2.331754	1.097133	1	5
Awareness of the benefits of using MRS (IU2)	211	2.379147	1.103389	1	5
Access to mobile money services=MRS use (IU3)	211	2.36019	1.06598	1	5
MRS offers useful and satisfying services (SQ1)	211	2.35545	.9864347	1	5
Quality of MRS is good (SQ2)	211	2.549763	1.108898	1	5
MRS = High cost (TC1)	211	2.616114	1.19504	1	5
Service charge (TC2)	211	2.663507	1.185445	1	5
Financial barriers to using the MRS (TC3)	211	2.64455	1.087464	1	5
MRS is always accessible (AC1)	211	2.402844	1.04826	1	5
Problems with the use of MRS (AC2)	211	2.483412	.9628627	1	5
MRS is available everywhere (AC3)	211	2.402844	1.061801	1	5
MRS is reliable (ST1)	211	2.317536	1.00883	1	5
MRS authentic and reliable in its claims (ST2)	211	2.388626	.9465041	1	5
Secure data for using the MRS (ST3)	211	2.473934	1.029578	1	5
Use of MRS disclose my info (ST4)	211	2.454976	1.019622	1	5
Satisfied with the overall performance of MRS (ST5)	211	2.601896	1.126645	1	5

Note: PU1-PU4 stands for questions concerning PERCEIVED USEFULNESS; PEOU1-PEOU4 stands for questions relating to PERCEIVED EASE OF USE; IU1-IU3 stands for questions about THE INTENTION TO USE; SQ1-SQ2 stands for questions concerning SYSTEM QUALITY; TC1-TC3 stands for questions concerning TRANSACTIONAL COST; AC1 AC3 stands for questions relating to ACCESSIBILITY; ST1-ST5 stands for questions concerning TRUST. Source: Author's construct (2022).

4.4 FACTOR ANALYSIS

Factor analysis is an interdependence technique that helps to find existing underlying structures of variables in a study. Its also a means of statistically cleaning and evaluating appropriate variables for analysis (Hair et al., 2014). In this study, we applied factor analysis for these two reasons. We present the outcomes of the factor analysis estimation and its associated diagnostic tests in the following analyses.

4.4.1 KMO & Bartlett's Test of Sphericity

One of the key assumptions underlying factor analysis is the strong correlation and reliability between the variables under consideration. In this study, Bartlett's test of sphericity was used to ascertain whether there is a significant correlation between the variables. The Kaiser-Meyer-Olkin Measure (KMO) test of sampling adequacy was also used. From Table 3, the KMO and Bartlett's test of sphericity is statistically significant at the 0.01 significance level. This means that our sample of 211 is adequate, and there is a high intercorrelation between all the constructs in the questionnaire.

Table 4.3: KMO and Bartlett's Test of Sphericity

KMO	Bartlett's Test	df	Sig.
.879	1.555E3	276	.000

Source: Author's construct (2022).

4.4.2 Deciding on the Number of Components

The components consist of the various groups or themes forming the study's conceptual framework. We used the Scree plot to find the ideal number of themes, as shown in Figure 4.8. From the scree plot, it can be observed that there was a sharp fall in the eigenvalues between the

first and second components. After the second component, the shape of the plot remained consistent up to the fifth one, though on a declining path. A slight structural change occurred between the sixth and seventh. The plot remained relatively flat after that showing a further slow decline in the eigenvalues. From both the Scree test and latent root test criteria, we can observe that the corresponding eigenvalue to the fifth component is not below the recommended figure of 1. The study adopted the proposed five components out of the twenty-four (24). The outcomes of the factor loadings of each of the measures are discussed next.

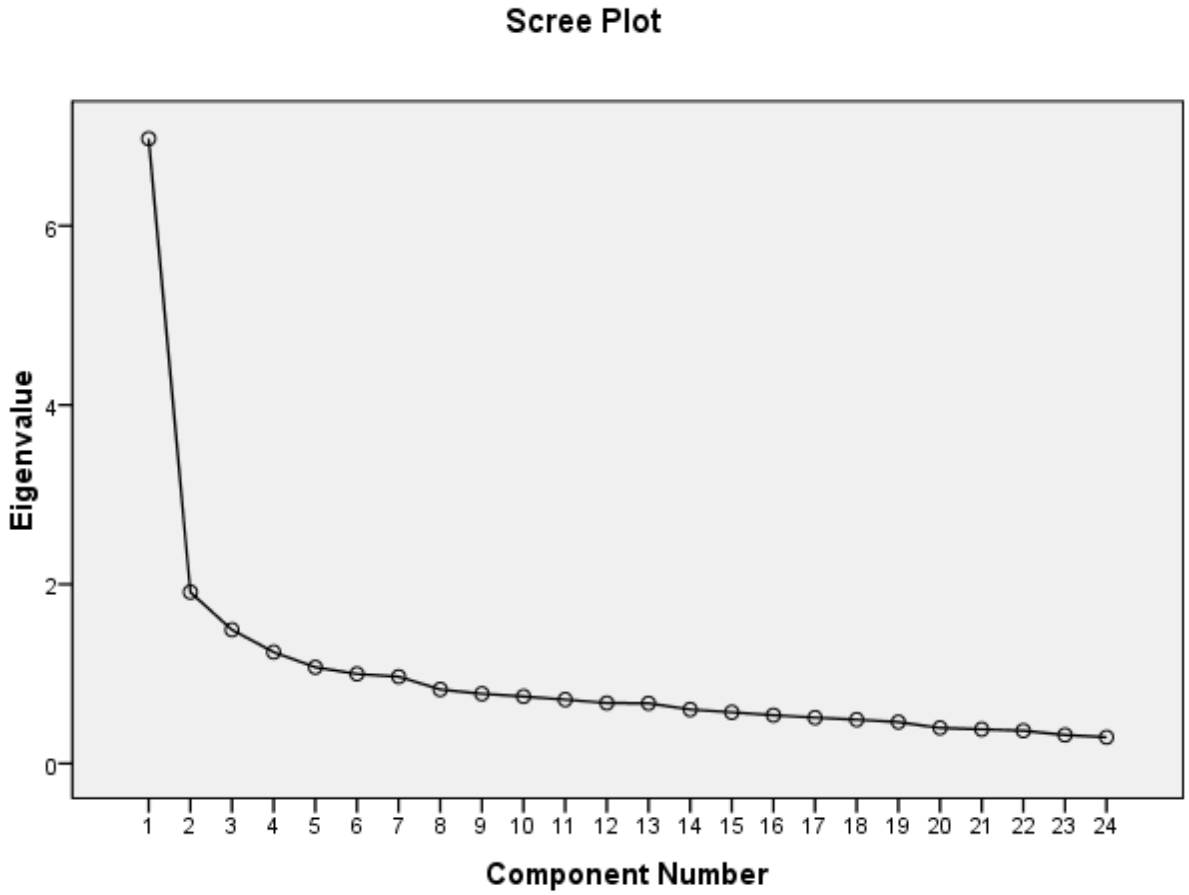

Figure 4.8: *Scree plot*

Source: Author's construct (2022).

4.4.3 Rotated Component Matrix Including all Constructs

The results of the rotated principal component analysis (PCA) are shown in Table 4.4. The rotation method used is the Varimax with Kaiser Normalization. From the unrotated table, we can observe that some items loaded high and others were low. According to Hair et al. (2014), minimum factor loadings of $\pm.3$ to $\pm.4$ are ideal for structural interpretation. In this study, we adopted the $\pm.4$ minimum level as a standard rule to either retain or remove a construct under any of the components. Based on this standard, AC1, the first measure under the accessibility group, was removed from the analysis because it failed to meet the required minimum loading under any of the components.

Table 4.4: Rotated Component Matrix including all measures

	Component				
	1	2	3	4	5
PU1	.494	.429	-.021	.176	.191
PU2	.668	.184	.018	.117	.359
PU3	.456	.247	.309	.082	.312
PU4	.541	-.051	.113	.321	.153
PE1	.653	.198	.263	.205	-.030
PE2	.475	.346	.082	.249	-.126
PE3	.125	.149	.113	.640	-.179
PE4	.469	.371	.217	.005	-.069
IU1	.335	.630	.119	.106	.105
IU2	.038	.754	.091	.190	.001
IU3	.235	.583	.194	-.038	.308
SQ1	.380	.361	-.009	.232	.447
SQ2	.121	.565	.136	.270	.321
TC1	.004	.107	-.070	.701	.390
TC2	.235	.088	.087	.718	.087
TC3	.194	.130	.055	.656	-.013
AC1	.193	.299	.384	.193	.284
AC2	.503	.127	.255	.459	-.005
AC3	.315	.166	.613	.055	-.005
ST1	.153	.373	.490	.116	-.319
ST2	.291	-.033	.723	-.020	-.003
ST3	.051	.055	.712	.032	.164
ST4	-.197	.172	.618	.188	.241
ST5	.111	.157	.242	-.040	.721

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. a. Rotation converged in 8 iterations. **Source:** Author's construct (2022).

4.4.4 Rotated Component Matrix Excluding AC1

The AC1 measure was removed from the data after it failed to meet the retention loading standard. The result of the component matrix is shown in Table 4.5. From the table, it's evident that there were slight improvements in the factor loadings of the measures after AC1 was removed. For the measures that cross-loaded on more than one component, the measure was assigned to the component on which it loaded the highest. The five components are shown in the table with their respective compositions. To access the reliability and consistency of the measures in the components, we employed Cronbach's Alpha analysis. For practical significance, a minimum Cronbach Alpha of 0.7 is acceptable (Hair et al., 2014). Observing Table 4.5, the Cronbach Alpha of the last component (system quality) is below the minimum threshold. For this reason, we eliminated it from the list of components for the second stage of the study. At this stage, the KMO and Bartlett's test also provided significant results at the 0.01 significance level.

Table 4.5: Rotated Component Matrix excluding AC1

	Component	
	Factor Loadings	Cronbach Alpha
Perceived Usefulness		0.8080
PU1	.518	
PU2	.677	
PU3	.445	
PU4	.508	
PE1	.667	
PE2	.483	
PE4	.465	
AC2	.507	
Intention to Use		0.7030
IU1	.616	
IU2	.758	
IU3	.579	
SQ2	.567	
Transaction Cost		0.7245
TC1	.700	
TC2	.721	
TC3	.649	
PE3	.647	
Accessibility		0.7032
AC3	.620	
ST1	.486	
ST2	.731	
ST3	.708	
ST4	.616	
System Quality		0.4475
SQ1	.456	
ST5	.720	

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. a. Rotation converged in 7 iterations. The dependent variable is ‘ INTENTION TO USE. **Source:** Author’s construct (2022).

4.5 REGRESSION ANALYSIS

To find the influencing factors for the intention to use NHIS mobile renewal service, we employed the Ordinary Least Square (OLS) regression approach. This can concurrently measure the direction and magnitude of each influencing factor or variable thought to affect intent to adopt mobile technology in renewing health insurance. The components from the factor analysis served as the input factors for this second stage analysis.

The fundamental assumptions for any meaning OLS regression analysis are 1. linearity of the problem, 2. normality of the error term distribution, 3. constant variance of the error terms (homoskedasticity), 4. independence of error terms (no serial correlation) (Hair et al., 2014).

4.5.1 Computing Summated Scores

Summated scores are single average scores computed from various measures in a component. From our rotated component matrix, the Cronbach Alpha values for all the components meet the required 0.7 thresholds except for accessibility. The accessibility component was subsequently removed from further analysis in this study. The high Cronbach Alpha for the remaining components means that the reliability of the measures is adequate. The computed summated scores were then used in estimating our regression model. The assumptions underlying the model are discussed next.

4.5.2 Linearity Test: Augmented component-plus-residual plot

From the matrix graph, cost does not show a clear case of linearity. At the same time, accessibility, quality of service, and perceived usefulness (PU) appear to have some linearity with intent to use. However, a detailed observation from the augmented component-plus-residual plots indicates that the original regression lines cross the smoothed lines for all the variables at a different point on

the smooth line. These are indications of non-linearity and suggest a curvilinear relationship between the dependent variable and the independent variables.

Figure 4.9: *Matrix graph for all constructs*

Source: Author's construct (2022)

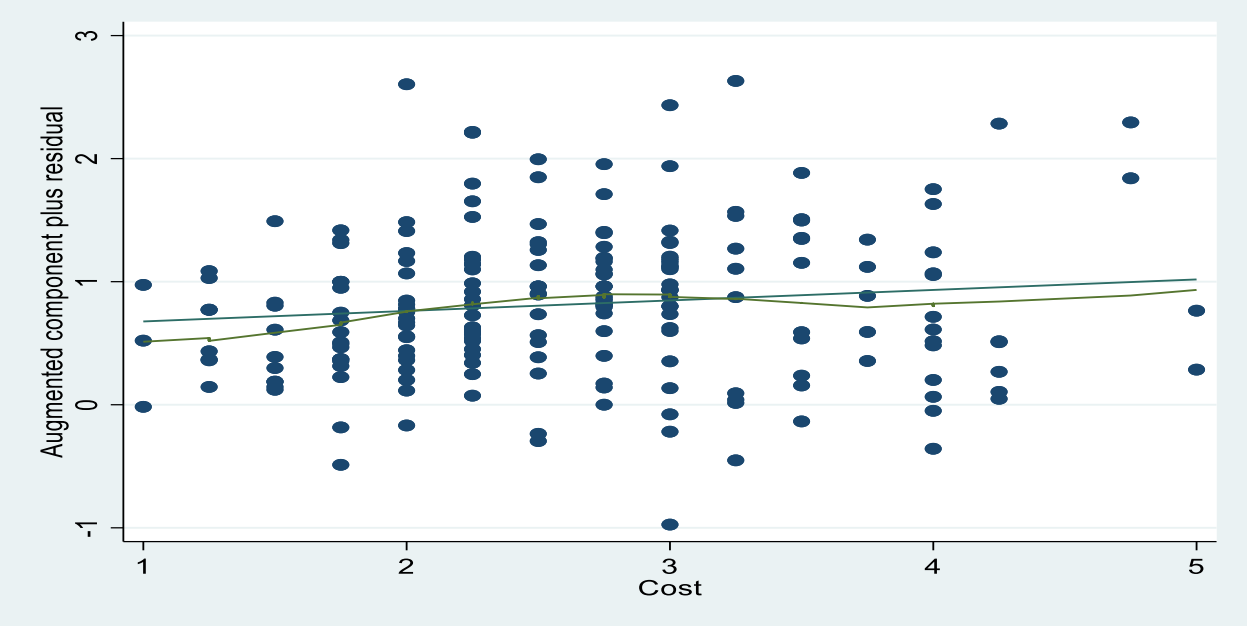

Figure 4.10: *Matrix graph for cost*

Source: Author's construct (2022)

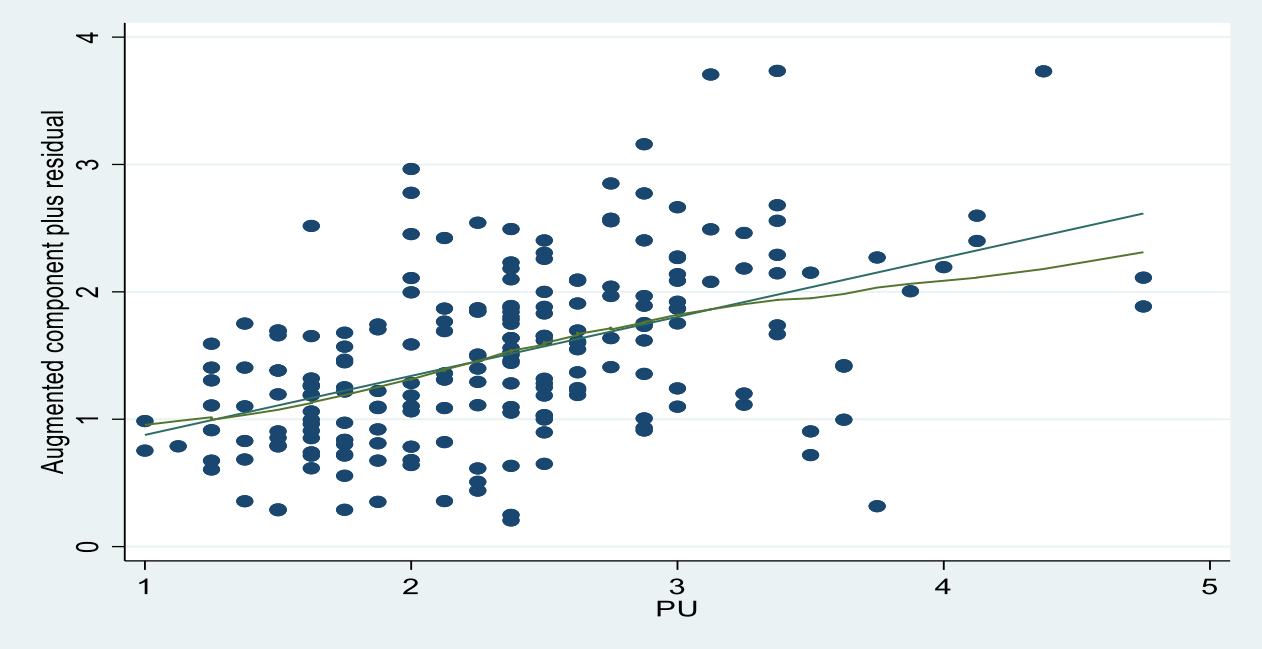

Figure 4.11: *Matrix graph for Perceived usefulness (PU)*

Source: Author's construct (2022).

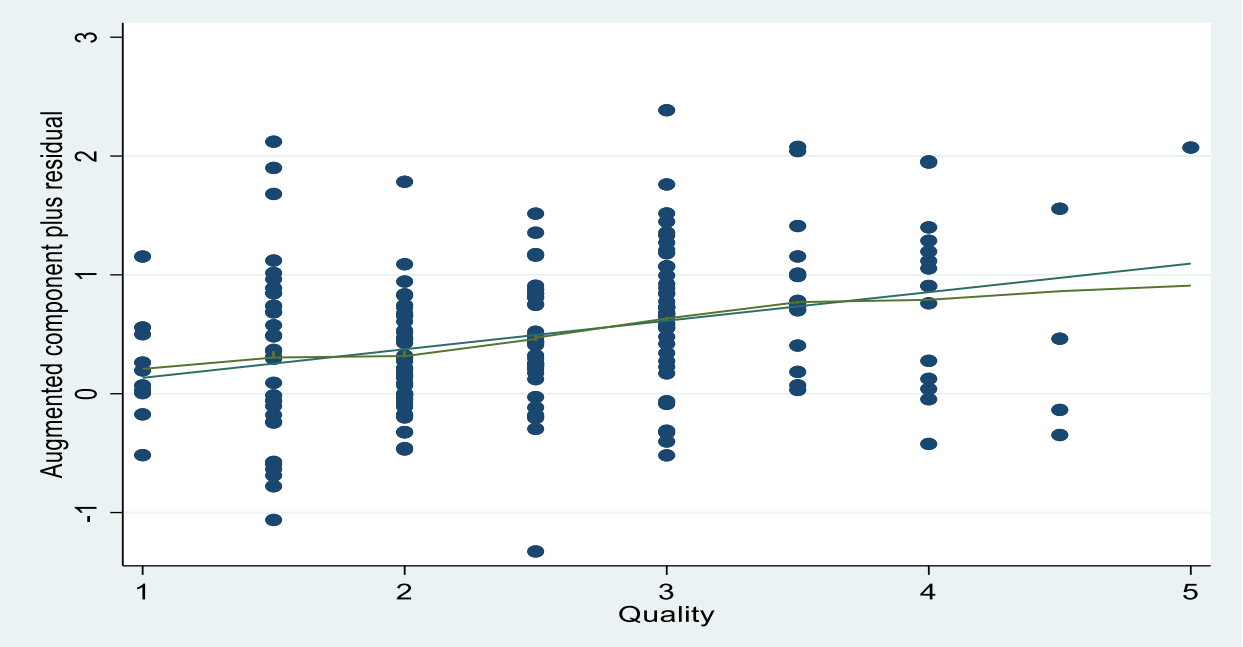

Figure 4.12: *Matrix graph for System Quality*

Source: Author's construct (2022)

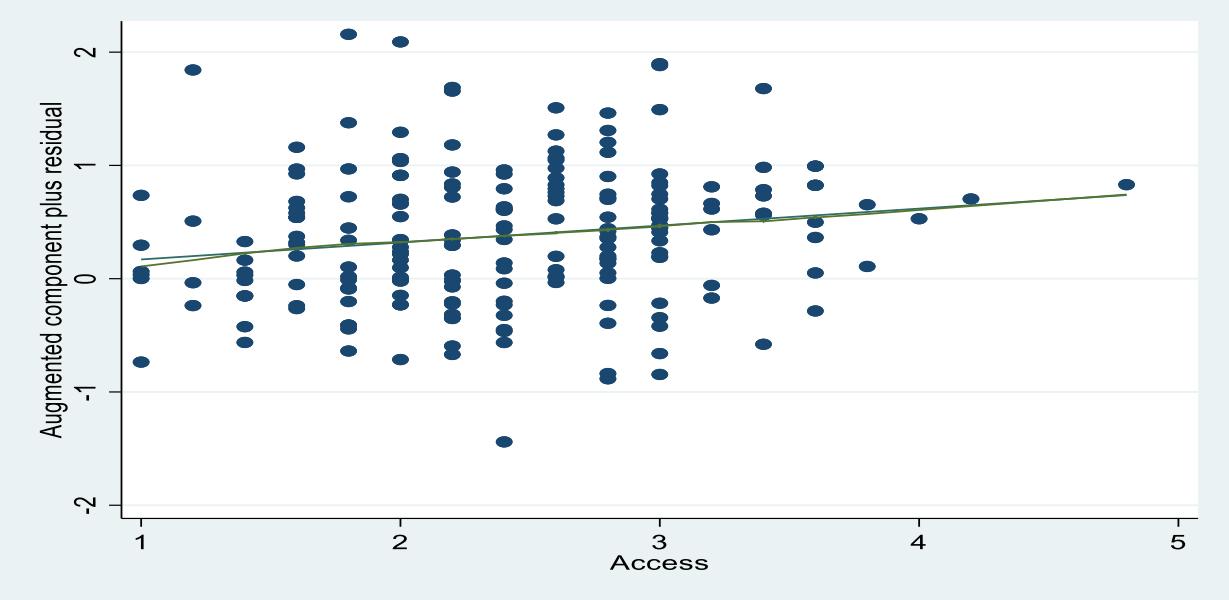

Figure 4.13: *Matrix graph for accessibility*

Source: Author's construct (2022).

To test for the normality of data, we used the Shapiro-Francia Wilk test for normality under the hypothesis that all the variables are normally distributed. From the results, we reject the hypothesis that cost, quality, and perceived usefulness are normally distributed. This means they violate the basic normality assumption.

Table 4.6: Shapiro–Francia W' test for normal data

Variable	Obs	W'	V'	Z	Prob>z
Cost	211	0.98531	2.504	1.904	0.02844
Accessibility	211	0.99509	0.837	-0.369	0.64401
Quality	211	0.98882	1.905	1.337	0.09056
PU	211	0.97348	4.52	3.13	0.00087

Source: Author's construct (2022).

For homoskedasticity or constant variance, we relied on the Breusch–Pagan/Cook–Weisberg test for heteroskedasticity. The test statistic of 7.46, corresponding to a p-value of 0.0063, indicates that we reject the null hypothesis of constant variance and conclude that heteroskedasticity is present.

Regarding serial dependence of errors, we did not compute any statistics since this cross-sectional data was conducted within a single time frame (2022).

4.6 REGRESSION RESULTS

4.6.1 Correlation Matrix

The correlation matrix shows the preliminary individual relationships between trust, cost, perceived usefulness, quality of service and intention to use the mobile renewal service. The initial outcomes indicate a significant positive correlation between the dependent and all the independent variables. This is good for any meaningful regression analysis. The inter-correlations among all the variables are also statistically significant, with P-value < 0.05. This, however, has the potential to pose multicollinearity challenges.

Table 4.7: Correlation Matrix

	intent	Access	Cost	PU	quality
Intent	1				
Access	0.4149*	1			
	0.0000				
Cost	0.3871*	0.2305*	1		
	0.0000	0.0007			
PU	0.6277*	0.4783*	0.5129*	1	
	0.0000	0.0000	0.0000		
Quality	0.5180*	0.3125*	0.3008*	0.5047*	1
	0.0000	0.0000	0.0000	0.0000	

Source: Author's construct (2022).

4.6.2 Model Diagnostics

Following the violations of linearity and normality in the auxiliary regression model, we found the cubic transformation of cost, PU, and quality variables. The decisions were arrived at based on the ladder of powers test in STATA and also on the nature of the variables as depicted in the plotted lines. Also, as a remedial measure to the heteroskedasticity problem, we found the log transformation of the dependent variable (intent). The Breusch–Pagan/Cook–Weisberg post-estimation test for heteroskedasticity after the transformation of the model led to the non-rejection of the null hypothesis of constant variance. The test results are presented in Table 4.8. Additionally, the model was estimated with robust standard errors for bias correction.

Multicollinearity was also assessed using the variance inflation factor (VIF) test. From the test results, none of the variables recorded a value above the recommended maximum threshold of 10 (Hair *et al.*, 2014). This means there isn't too much collinearity between the independent variables. The mean VIF score (1.34) can be found in Table 4.8.

4.6.2 Variance

This section displays the model's variance and discusses the coefficient of determination (R2). The R2 calculates the total effect size of the model. It is the total variance that the model's independent variables can account for (Hair et al., 2014). For significant, moderate, and weak impacts, Chin (1998) suggests the following R2 cutoffs of 0.67, 0.33, and 0.19, respectively. The R2 ratings for the model are shown in Table 4.8. According to the study's 0.3875 R2 statistics indicate that the independent variables System Quality, Transaction Cost, Accessibility, and Perceived Usefulness account for changes in Intention to Use Mobile Renewal Services with T statistics larger than 1.96 and P value less than 0.05. by a combined factor of about 38.75 per cent. The results suggest that

the independent variables adequately predicted the subscribers' intention to use the NHIS mobile renewal services.

4.6.3 Empirical Regression Results

According to Table 4.8's Empirical Regression Result, accessibility has a favourable, significant impact on users' intentions to utilize the mobile renewal service. According to the positive coefficient of 0.131 (P 0.001), approximately 13.1% of users' intentions to employ the mobile renewal service are explained by accessibility. The results suggest that NHIS subscribers' intentions use the mobile renewal service heavily depend on accessibility.

On Intention to Use, Perceived Usefulness indicates a significant positive influence with a 0.00618 (P 0.002) coefficient. This shows that an increase of 1% in perceived usefulness will result in an increase of 0.00618 in the intention to use the mobile renewal service. The outcome demonstrates that the NHIS subscribers' Intention to Use the Mobile Renewal Service is somewhat influenced by their Perceived Usefulness.

Additionally, the finding shows a strong positive correlation between System Quality and Intention to Use. The coefficient of 0.00117 (P 0.001) shows that at the 1% significance level, an increase in System Quality explains an increase in Intention to Use the Mobile Renewal Service of roughly 0.00117. The results suggest that the Mobile Renewal Service's System Quality affects subscribers' Intention to Use

On the other side, the study found a negligible positive correlation between Transaction Cost and Intention to Use. A percentage increase in Transaction Cost will decrease Intention to Use because of the positive coefficient of 0.0003 that Transaction Cost has on Intention to Use ($P > 0.75$). The Mobile Renewal Service Transaction Cost positively but insignificantly affects subscriber Intention to Use.

Table 4.8: Empirical Regression Results

Variables	Coef.	Robust HC3 std. err.	t	P>t	[95% conf. interval]	
trust	0.1313146	0.0301088	4.36	0.000	0.0719537	0.190676
cubcost	0.000355	0.0011105	0.32	0.750	-0.0018343	0.002544
cubPU	0.0061768	0.0020169	3.06	0.002	0.0022004	0.010153
cubquality	0.0045017	0.0011744	3.83	0.000	0.0021863	0.006817
_cons	0.2959613	0.0740418	4	0.000	0.1499845	0.441938
Obs.	211					
F(4, 206)	23.2					
Prob > F	0.000					
R-squared	0.3875					
Breusch–Pagan/Cook–Weisberg test heteroskedasticity						
Chi^2(1)	0.03					
Prob>chi^2	0.8663					
VIF (mean)	1.34					

Note: Dependent variable is intent. VIF is variance inflation factor.

Source: Author's construct (2022).

CHAPTER 5

5.0 DISCUSSION

In order to test the research model and the corresponding research questions, this survey used an OLS regression approach. The responses of 211 respondents were then analyzed using factor analysis to predict the factors influencing the adoption of NHIS mobile renewal services within the Lower Manya Krobo Municipality. In conclusion, the predictor variables (Perceived Usefulness, Accessibility, System Quality, Transactional Cost, and Intention to Use) reliably influence subscribers' intention to use the mobile renewal service, according to the analysis of the full model, which shows that the model is statistically significant.

The study found a significant positive correlation between system quality and intention to use the mobile renewal service. This indicates that NHIS subscribers' Intention to Use the Mobile Renewal Service depends on the quality of the Mobile Renewal Service. With reference to TAM, the importance of system quality to people's Intention to Use a system cannot be understated. System quality has mostly been argued to predict new system acceptance and usage in the literature (Chiang and Liao 2012). The degree to which users are fulfilled with the system's general quality is a key factor in determining any system's success (Chang et al., 2011, Alshurideh et al., 2019; Calisir et al., 2014; Rui-Hsin & Lin, 2018). For instance, Jaber (2016) reported that 70% of respondents in a sample of 189 university students were more inclined to use helpful e-learning platforms that were judged to have a good system quality, would allow them to save effort and time, and were always accessible with quick triangulation tools. Venkatesh & Davis (2000) provide the theoretical foundation for a large positive impact of system quality on intention to use.

The survey also reported a substantial favourable relationship between accessibility and intention to use the mobile renewal service. This suggests that everything else being equal, NHIS subscribers' Intention to Use the Mobile Renewal Service is influenced by the Mobile Renewal Service Platform Accessibility. In the theory of the extended TAM, accessibility plays a significant role in determining subscribers' intentions to use a system. Accessibility has reportedly been a predictor of new system usage in the literature (Culnan, 1985; Rice & Shook, 1988; Kerr & Hiltz, 1982). It is practical to assume that the mobile renewal service's physical and informational accessibility may significantly influence consumers' usage intentions. The results of numerous other research (Zhou, Bao, Watzlaf, & Parmanto, 2019) support the relevance of accessibility in determining whether or not potential users will accept and use a new system.

The study found a negligible correlation between transaction cost and intention to use in terms of the transaction cost. Despite indicating an insignificant link, the study demonstrates a positive relationship between subscribers' Intention to Use and the Transaction Cost of the Mobile Renewal Service. This discovery differs from the existing literature. According to the literature, the cost of innovation and the likelihood that it would be used are inversely related. This is supported by numerous research, which shows that perceived costs can influence whether a new system is adopted or not (Luarn and Lin, 2005; Dahlberg *et al.*, 2008; Hanafizadeh *et al.*, 2014). That is because consumers are more likely to adopt and use a service when they believe the cost to be reasonable (Cline & Luiz, 2013; Peng, Kanthawala, Yuan, & Hussain, 2016; Zhou et al., 2019). Additionally, this study disagrees with David-West, Oni, and Ashiru, (2021) conclusions regarding the utilitarian aspect of innovation diffusion.

The findings for perceived usefulness and perceived ease of use show a significant correlation between only perceived usefulness and intention to use the mobile renewal service. This study

only supports the perceived usefulness portion of the existing theory, which contends that subscribers' intentions to utilize the NHIS Mobile Renewal Service are influenced by their perceptions of the system's perceived ease of use and utility. This is contrary to the TAM framework, which proposed that "perceived utility" and "perceived ease of use" are the attitudes that best express the intention to adopt and employ innovation or technology" (Davis, 1989). As a result, the utility and usability of an innovation or technology determine whether or not a person will use and accept it. The results of Gefen and Straub, (2000) study of 40 MBA students showed that solely perceived utility impacted their propensity to use the system. These findings, however, support those findings.

Additionally, the majority of studies that look at the nature and connections between perceived usefulness and perceived ease of use and behavioral intention have discovered that perceived usefulness consistently has an effect on the behavioral intention to use (Gefen and Straub, 2000). However, few research have discovered that PEOU directly impacted behavioral intention to use in addition to PU (Addae-Nketiah, 2022). The inconsistency of PEOU with regard to its link with usage behavior was brought out by Gefen and Straub (2000) The intrinsic and extrinsic aspects of information technology-related tasks were used to explain the contradiction (IT). The results of this study imply that whether PEOU directly influences use-intention depends on the type of activity.

CHAPTER 6

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 CONCLUSIONS

In conclusion, the current study made a number of findings. In order to make a good assessment, we probed into the number of years the respondents have been on the NHIS and has been able to access healthcare delivery under the scheme. The outcomes show that a lot of the participants have been with the scheme for more than five years as a result, have a good involvement with the use of the NHIS. For that matter, their views articulated serve the purpose of this studies. The findings also propose that 56.9 percent subscribers embrace the interpretation that the NHIS has contributed to a significant improvement in the quality of health systems. The outcome demonstrates that the majority of NHIS subscribers (84.4%) are aware of the mobile renewal service platform within Lower Manya Municipal. We also identify that a great number of the subscriber accounting for 76.3 percent of the study participants have ever used the mobile renewal service before. The overall quality of the mobile renewal service for accessing healthcare delivery also shows a great number of respondents (58.3 percent) responding favorable to the question which is in line with what was reported by similar studies. The findings relating to continuity of the mobile renewal services, an overwhelming majority of the participants (88.2 percent) responded to endorsed its continuity with just 8.5 percent advocating for its suspension.

6.1.2 Factors influencing subscribers' intention to use NHIS mobile renewal service

The study employed system quality, transaction cost, accessibility, perceived ease of use, and perceived usefulness, to understand subscribers' intention to use the mobile renewal service under

the NHIS in the Lower Manya Krobo Municipality of Ghana. Per the result, the following conclusions can be inferred:

1. It can be concluded that system quality influence NHIS subscribers' intention to use the mobile renewal service.
2. The result of the research has led to the conclusion that accessibility has the potential to affect NHIS members' decision to use the mobile renewal service.
3. It has also been proven that perceived use affects NHIS members' decision to opt for the mobile renewal application.
4. An intriguing inference is that transaction costs do not deter subscribers from using the mobile renewal service.
5. Finally, it can be inferred that perceived ease of use is not a determinant of NHIS subscribers' intention to use the mobile renewal service.

6.2 RECOMMENDATIONS

6.2.1 To Policymakers

Policymakers who are concerned with NHIS should focus on Mobile renewal System Quality, Accessibility, and Perceived Usefulness. Because a decline these factors can impede the progress made in decongesting the NHIS offices since the introduction of NHIS mobile renewal service.

6.2.2 Further Research

We suggest that further research should be carried out in other parts of Ghana to further understand the factors that are likely to influence subscribers' intention to use mobile renewal service. Again, other factors such as demographic variables can be study to know if the demographic characteristics facilitate or impedes subscriber intention to use the mobile renewal service. Finally

further research is needed to assess satisfaction subscribers' use of mobile renewal service and the effect on their health seeking behavior.

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APPENDICES 1: QUESTIONNAIRE

ENSIGN GLOBAL COLLEGE, KPONG, QUESTIONNAIRE ON ADOPTION OF MOBILE RENEWAL SERVICE BY NATIONAL HEALTH INSURANCE SCHEME

Dear Respondent,

This research is being undertaken as part of the requirement for the award of a Master's in Public Health. The research seeks to study the adoption of the Mobile Renewal Service by the National Health Insurance Authority Scheme and its effects on access to healthcare. The research is strictly for academic purposes, hence information given would be given high sense of confidentiality. I would be grateful if you could take a few minutes of your time to answer the following questions.

1. Please indicate your gender
   - ◯ Male
   - ◯ Female
2. Highest level of education
   - ◯ High School or below
   - ◯ Diploma
   - ◯ Bachelor
   - ◯ Masters
   - ◯ PhD
   - ◯ Professional Certificate
3. Where are you employed?
   - ◯ Private Sector
   - ◯ Public Sector
   - ◯ Unemployed
4. What is your age range?

- ◯ 21-29 years
- ◯ 30-39 years
- ◯ 40-49 years
- ◯ 50 years and above

5. How long have you been a subscriber to the National Health Insurance Scheme?
   - ◯ 5 years and below
   - ◯ Between 5 and 10 years
   - ◯ Between 10 and 15 years
6. Have you accessed healthcare under the National Health Insurance Scheme before?
   - ◯ Yes
   - ◯ No
7. How do you see healthcare delivery under the National Health Insurance Scheme?
   - ◯ Very Poor
   - ◯ Poor
   - ◯ Moderate
   - ◯ Good
   - ◯ Very Good
8. Do you know about the NHIS Mobile Renewal Service?
   - ◯ Yes
   - ◯ No
9. Have you ever used the Mobile Renewal Service before?
   - ◯ Yes
   - ◯ No
10. If yes, how will you rate the service?

- ◯ Very Poor
- ◯ Poor
- ◯ Moderate
- ◯ Good
- ◯ Very Good

11. Do you agree that the Mobile Renewal Service should be continued or suspended?

- ◯ Continued
- ◯ Suspended
- ◯ Non Applicable

ENSIGN GLOBAL COLLEGE, KPONG, QUESTIONNAIRE ON ADOPTION OF MOBILE RENEWAL SERVICE BY NATIONAL HEALTH INSURANCE SCHEME.

Determining the factors for continuance intention to use the Mobile Renewal Service to renew Health Insurance Policy.

Please rate the extent to which you agree or disagree with the following statement. Using 5 scale rating whereby: Strongly Disagree (5), Disagree (4), Moderately Agree (3), Agree (2) and Strongly Agree (1)

Perceived Usefulness Statements

12. Using the Mobile Renewal Service enables me to renew my health insurance faster.

	1	2	3	4	5
	◯	◯	◯	◯	◯

13. The Mobile Renewal Service saves me time and resources in renewing my health insurance.

	1	2	3	4	5
	◯	◯	◯	◯	◯

14. The Mobile Renewal Service enhances my effectiveness in renewing my health insurance

1 2 3 4 5

15. The Mobile Renewal Service increases productivity in healthcare delivery

1 2 3 4 5

Perceived Ease of Use Statements

16. The Mobile Renewal Service is easy to use

1 2 3 4 5

17. Learning to use the Mobile Renewal Service is easy

1 2 3 4 5

18. Interactions with the System requires a lot of mental effort.

1 2 3 4 5

19. My interactions with the system is clear and understandable

1 2 3 4 5

Intention to Use Statements

20. I will use the Mobile Renewal Service to renew my health insurance

1 2 3 4 5

21. I am aware of the benefits of using the Mobile Renewal Service as much as possible

1	2	3	4	5
◯	◯	◯	◯	◯

22. If I have access to mobile money services, I will use the Mobile Renewal Service

1	2	3	4	5
◯	◯	◯	◯	◯

System Quality Statements

23. Mobile Renewal Service offers useful and satisfying services

1	2	3	4	5
◯	◯	◯	◯	◯

24. The quality of Mobile Renewal Service is good

1	2	3	4	5
◯	◯	◯	◯	◯

Transaction Cost Statements

25. The use of Mobile Renewal Service has a high cost

1	2	3	4	5
◯	◯	◯	◯	◯

26. The service charge by the telecommunication companies for using the Mobile Renewal Service is high

1	2	3	4	5
◯	◯	◯	◯	◯

27. I face some financial barriers to use the Mobile Renewal Service

1	2	3	4	5

Accessibility Statements

28. The Mobile Renewal Service is always accessible.

1	2	3	4	5
◯	◯	◯	◯	◯

29. Disruptions and problems always occur in accessing the Mobile Renewal Service

1	2	3	4	5
◯	◯	◯	◯	◯

30. Mobile Renewal Service is available everywhere and every time even on holidays.

1	2	3	4	5
◯	◯	◯	◯	◯

Statements on Trust

31. The Mobile Renewal Service is reliable

1	2	3	4	5
◯	◯	◯	◯	◯

32. The Mobile Renewal Service is authentic and reliable in its claims

1	2	3	4	5
◯	◯	◯	◯	◯

33. I trust the telecommunication operators to provide secure data communication for using the Mobile Renewal Service

1	2	3	4	5
◯	◯	◯	◯	◯

34. The use of the Mobile Renewal Service will not disclose my personal information

1	2	3	4	5
◯	◯	◯	◯	◯

Satisfaction Statements

35. I am satisfied with the overall performance of the Mobile Renewal Service

1	2	3	4	5
◯	◯	◯	◯	◯

Thank you

APPENDICES 2: APPROVAL FROM NHIA

NATIONAL HEALTH INSURANCE AUTHORITY
Opposite, Olikedeke Hotel, Nuaso
P.o. BOX OK 266 Odumase Krobo,
Tel: 0501698674
Email; mkdmhi@yahoo.com YNHIS
Website; www.nhis.gov.gh

Your Ref. No: Your access to Healthcare

12th July, 2022

To whom it may concern,

Dear Sir,

NHIS SUBSCRIBERS AS RESPONDENTS

We hereby grant permission to Daniel Kumahor a final year student of Ensign Global College at Kpong in the Lower Manya Krobo Municipality of the Eastern Region to use NHIS subscribers within our catchment area for academic purposes only.

Our office is also ready to give him the necessary assistance in this regard.

Yours faithfully,

Solomon T tteh Agyemani
(District Manager, NHIS, Manya Krobo)
DISTRICT MANAGER

NATIONAL HEALTH INSURANCE SCHEHE
MANYA KROBC
BOX 266. ()DUMAS' KROBC

APPENDICES 3: ETHICAL CLEARANCE

ENSIGN GLOBAL

COLLEGE

OUR REF: ENSIGN/1RB/EL/SN-203 July 08, 2022.
YOUR REF:

INSTITUTIONAL REVIEW BOARD SECRETARIAT

Kumahor Daniel
Ensign Global
college Kpong.

Dear Daniel,

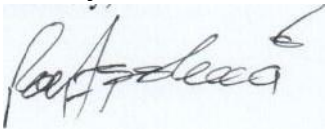
ETHICAL CLEARANCE TO UNDERTAKE POSTGRADUATE RESEARCH

At the General Research Proposals Review Meeting of the INSTITUTIONAL REVIEW BOARD (IRB) of Ensign Global College held on Tuesday, June 21, 2022, your research proposal entitled "**Predictors of Mobile Technology Adoption of NHIS renewal Service in the Lower Manya Krobo Districts in the Eastern Region, Ghana**" was considered.

You have been granted Ethical Clearance to collect data for the said research under academic supervision within the IRB's specified frameworks and guidelines.

We wish you all the best.

Sincerely,



Dr. (Mrs.) Rebecca Acquaah-Arhin
IRB Chairperson

APPENDICES 4: TURNITIN PLAGIARISM RESULT

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