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Candidate full name
Jiayi Cai

Master in Management

Supervisor: Henrique Manuel Gil Martins
MD PhD, Invited Associate Professor,
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BUSINESS
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Acknowledgment

I am grateful to my professor for his invaluable patience and feedback when facing my questions. I could not have completed this dissertation without Professor Henrique, who carefully provided dissertation guidance and revision advice.

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Resumo

Com o rápido aumento do uso da Internet na China e o surto do Covid-19 no início de 2020, a Saúde Comunitária através de tecnologias móveis (Community Mobile Health) foi sendo reconhecida e utilizada por mais moradores, mas ainda se encontra num estadio inicial. Portanto, esta pesquisa tenta encontrar os motivos que afetam a intenção de uso dos moradores em relação à CMH o seu impacto.

Através da análise da literatura, foi feito um resumo das principais evidências sobre uso das tecnologias móveis em saúde comunitária. O modelo de investigação foi baseado na combinação do modelo S-O-R e modelo TAM. Análise de dados foram realizadas nos 451 dados amostrais válidos coletados pelo questionário por meio do SPSS22.0 e AMOS24.0.

Por meio da pesquisa empírica, as seguintes conclusões são extraídas: (1) Idade, gênero e capacidade digital apresentaram diferenças significativas na intenção de uso; (2) A utilidade percebida, a facilidade de uso percebida tiveram um efeito positivo significativo na intenção de uso, (3) a qualidade da informação tem um efeito positivo significativo na intenção de uso; (4) a qualidade da informação e a qualidade da interação tiveram um impacto positivo nos residentes facilidade de uso percebida e utilidade percebida.

Os resultados da pesquisa mostram que o governo, os gestores de centros de saúde e empresas de TI relacionadas à medicina precisam trabalhar juntos para desenvolver e melhorar gradualmente a saúdemóvel da comunidade, de modo a cultivar a conscientização dos moradores sobre o uso da saúde móvel da comunidade.

palavra-chave: saúdemóvel; cuidades saúde primarios; Technology Acceptance Model; Computadores; Saúde Digital; Telesaúde

Abstract

With the rapid development of Internet technology in China and the outbreak of the Covid-19 at the beginning of 2020, community mobile health was recognized and used by more residents, but still in the early stage of development. Therefore, this research is trying to find the reasons that affect the residents' usage intention towards community mobile health, and the mechanism of the impact.

In this research, through literature analysis, a large number of achievements about mobile health and community health service were summed up. And finally the research model was based on the combination of the S-O-R model and technology acceptance model. Data analysis was carried out on the 451 valid sample data collected by the questionnaire through SPSS 22.0 and AMOS 24.0.

Through empirical research, the following conclusions were drawn: (1) Age, gender and digital capacity had significant differences in the usage intention; (2)Perceived usefulness, perceived ease of use had a significant positive effect on the usage intention, (3) information quality had a significant positive effect on usage intention;(4) the information quality and interaction quality had a positive impact on residents' perceived ease of use and perceived usefulness.

These survey results show that the government, community health center managers, and medical-related IT companies need to work together to gradually develop and improve community mobile health, so as to cultivate residents' awareness of using community mobile health.

Key word: mobile health; community health service; TAM; Computers; Digital Health; Telehealth

Content

CHAPTER 1

Introduction

1.1. Research background

The COVID-19 pandemic threw the whole world suddenly into confusion, uncertainty, and change, disrupting our economies, public health, and medical-care systems (Peters et al., 2022). According to the report from the WHO (2022), as of 24 July 2022, more than 567 million confirmed cases have been reported globally. To stop the spread of the virus, the Chinese government has positioned the Covid-19 pandemic as the most urgent public health emergency and has implemented strict measures from the beginning stage, including city lockdown, traffic control, and home quarantine (Sun et al., 2020). So, China successfully managed to contain the spread of COVID-19, showing that the native transmission has almost stopped (Wu et al., 2021).

China is said to have entered the "post-epidemic" era with normalized epidemic prevention and control except for some local occurrences in 2022. Although the peak period of confirmed cases of COVID-19 in China has passed, in the post-epidemic era, repeated small-intensity epidemics and the continuous mutation of the virus are the main problems that the Chinese government and people need to face and solve (Li et al., 2022). The COVID-19 pandemic has presented a dual challenge for health systems, maintaining routine services and preventing the virus from spreading further in other care areas while treating patients with COVID-19 (Webb et al., 2022).In 2021 and 2022, the epidemic rebound happened in different provinces, such as Guangzhou, and Shanghai, meaning that the medical system still was under huge pressure until recently.

In face of a serious challenge of providing effective health care service, primary care services and the usage of mobile health have become a more preeminent and important way for governments to mitigate and suppress COVID-19 (Wu et al., 2021). The Declaration of Alma-Ata (1978) described that “primary care is the first level of contact of individuals and families with the national health system, bringing health care as close as possible to where people live and work”. Community healthcare is an affordable, accessible and equal service

for everyone, with primary health institutions as the main body of service, providing community residents with various services such as prevention, treatment, rehabilitation, and popularization of medical and health care knowledge (Wang et al., 2011; Du,2017). According to the 2021 Chinese Health Statistical Yearbook (National Health Commission of PRC, 2021), by the end of 2020, there were 970,036 primary medical and health institutions, an increase of 15,646 over 2019. The number of primary health institutions increased by 10,751 from 2018 to 2019. During these three years, the number of primary health institutions increased year by year. Especially, the number of primary health institutions increased faster from 2019 to 2020, when the epidemic outbreak, showing that the epidemic has accelerated this process.

Due to prevention and control measures during the pandemic, people were asked to spend more time at home and to avoid the possibility of cross-infection when doing daily activities including visiting healthcare professionals. Internet hospital was a new type of outpatient medical treatment, providing health services to patients through Internet technology (Xie et al., 2017). It meant that the way of providing mobile medical services through the internet had the potential to alleviate the inaccessibility, unavailability, and inequity of health services in particular lockdown situations (Wu et al., 2021). It also meant a rapid increase in the usage of mobile health services, especially showing that the number of Internet hospitals was growing rapidly. According to Xinhua News Agency (2021), “as of June 2021, Internet hospitals in China had surpassed 1,600, including 500 new ones in the first half of 2021”. According to the 49th statistical report on China’s Internet Development (China Internet Network Information Center, 2022), China has a strong base of Internet use. As of December 2021, the number of netizens (citizens using the internet) in China had reached 1.032 billion, an increase of 42.96 million compared with December 2020 (Fig.1.1). More importantly, until the end of 2021, the size of online medical service users in China reached 298 million, an increase of 83.08 million from December 2020, accounting for 28.9% of the total netizens, making it one of the fastest-growing application segments.

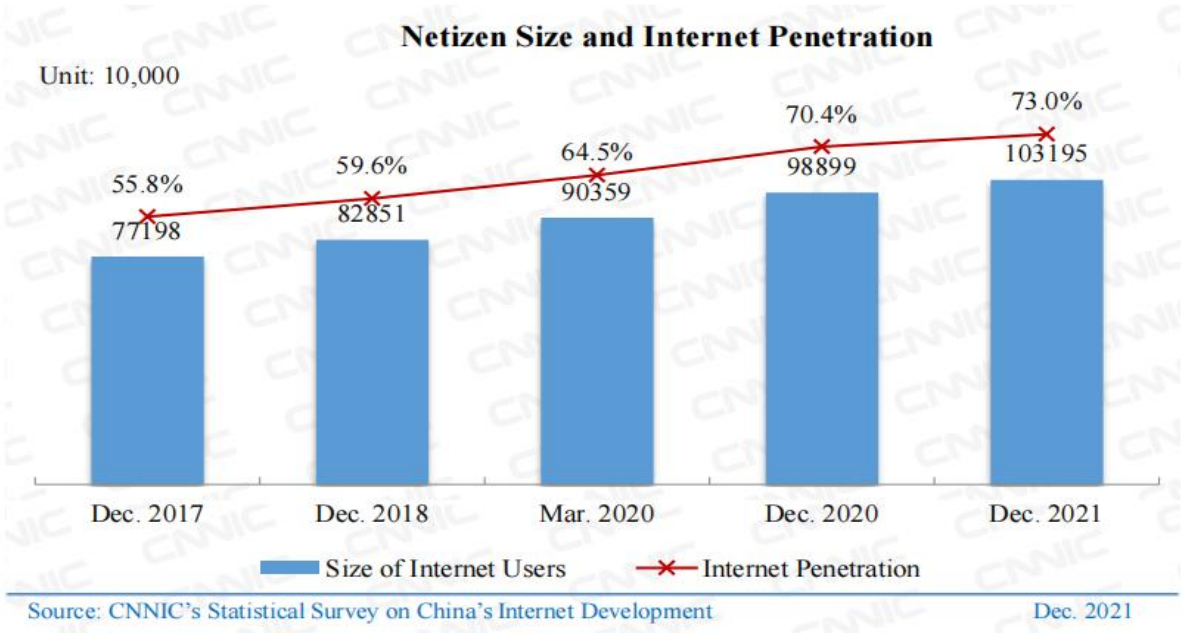

Figure 1.1: Netizen Size and Internet Penetration

Hospitals offering services over the internet (telehealth services) sprung up, gaining considerable traction among the public. Most of them had geometric growth of visitors. During the early epidemic, the health service delivery by internet increased rapidly, which is 17 times higher than the same period in 2019 (Wu et al., 2021). At the same time, from January 22 to February 25, 2020, the total number of online consultations exceeded 4.26 million, an increase of 278% over the previous month (Sun et al., 2020). Many mHealth apps provided direct communication links between patients and healthcare professionals in areas such as health education, and chronic disease management that required long-term and daily management (Palos-Sanchez et al., 2021). In the face of extreme pressure from the COVID-19 pandemic, mobile applications were helping people, healthcare providers, and policymakers in many aspects, like reducing the burden on hospitals, getting reliable information, tracking symptoms, mental health, etc. (Abbaspur-Behbahani et al., 2022). Perhaps, when mobile technologies are applied to basic medical and basic public health services of community health service institutions, the health care services can become more effective and create new ways for the health management of community residents. And this is what this study seeks to help understand.

1.2. Research gap & Research question

There has been significant ongoing research about mHealth around the world, mainly focusing on its development and trends (Fiordelli et al., 2013; Istepanian, 2022); as well as, user intent to adopt and use mHealth services(Shan et al., 2019; Birkmeyer et al., 2021; Deng et al., 2018). Some research has been looking at the effectiveness of using these technologies(Free et al., 2013), and targeted research around its use for a single disease or population(Kampmeijer et al., 2016; Wang et al., 2017; Lee et al., 2019). In China, most of the studies about community mobile health have focused on the models or industry development (Li et al., 2015; Dou et al., 2021; Peng et al., 2021). And those researches about user intention have been only focused on one area like mobile health (Zhao, 2017; Chen, 2020; Du, 2019); or community health services(Liu, 2017; Wang et al., 2021). There have been few empirical research focused on the resident's usage intention of community mobile health.

Due to the needs arising from the pandemic, the growing status, and importance of the chronic disease, the burden of its management, and the general aging of the population in China, Community Mobile Health Management (CMHM) is likely to become an effective way to relieve the healthcare system pressure, improve medical efficiency and promote the health of residents in the long-run. For the purposes of this research, CMHM is defined as the provision of primary and proximity care to communities through the use of Mobile Health solutions.

This research aims to identify which are the factors that promote mobile health in CMHM as a way to provide some help for improving China's future community health management model. Two research questions are formulated.

Q1. What are the attitudes of China residents towards Community Mobile Health Management platforms and applications?

Q2. What are the factors that affect China residents' use of mobile health management services?

The first question is trying to know the attitude of residents, which includes the general attitude towards community mobile health and difference in attitude from people with various characteristics.

The second seeks to explore what aspects affect residents process of using mobile health

care solutions for health management, and indirectly affect residents' willingness to use.

1.3. Research aim & objective

This research seeks to understand the current status of CMHM services, and the residents' needs, and also, explore residents' intention of community health management activities. It used a survey of residents' utilization and attitudes of mobile health management services constructed from concepts drawn from the theory of technology acceptance model (TAM) and stimulus-organism-response(SOR) model. In the attempt to be able to produce suggestions for improving the design and implementation of community health management models based on mobile health this work may help create effective CMHM services.

The focus is on Chinese people who have experienced mobile health services offered by their nearby community health centers. This was partially motivated by the authors' origin and best fit the pandemic period when the work was conducted.

1.4. Structure

The first chapter is the introduction part and covers the research background, research questions, research gap, research aims and research objects of this dissertation.

The second chapter is the literature review part. This chapter is mainly divided into three parts. The first part mainly introduces the relevant knowledge of community mobile health, including the definition of mobile health, community health management and potential users, and proposes the definition scope of community mobile health in this dissertation. Secondly, it introduces TAM and SOR, two theoretical models related to this dissertation. Based on worldwide papers on mobile health and community mobile health, the third part is mainly a review of China and foreign literature and making a summary here.

The third chapter is model construction and research hypothesis. According to relevant theories, this dissertation explores and analyzes the correlation between the influencing factors of community mobile health and usage intention.

Chapter 4: Methodology. Based on the above research assumptions, this dissertation draws on the mature scales of previous scholars and combines the characteristics of community mobile health to measure the research variables. Finally, the obtained indicators are combined

with the knowledge of relevant questionnaire design to obtain a questionnaire about usage intention towards community mobile health.

The fifth chapter is empirical research. The reliability and validity of the data obtained from the questionnaire survey were tested, and the data was cleaned to obtain valid questionnaire data. Descriptive statistical analysis was carried out on the valid questionnaire data, and a structural equation model for the usage intention of community mobile health was constructed.

The sixth chapter discusses the data results, summarizes the results of the empirical research, and explores the relevant reasons, which mainly included the aspects of the stimulus, organism, response, personal factors, and digital literacy.

Chapter 7 concludes the limitations of this dissertation and some ideas for future work.

The last chapter, conclusions and recommendations. it puts forward specific suggestions based on the results obtained by the model. At the end of the dissertation, the prospect of the future of mobile health is put forward. The structure of this dissertation is shown in Figure 1.2.

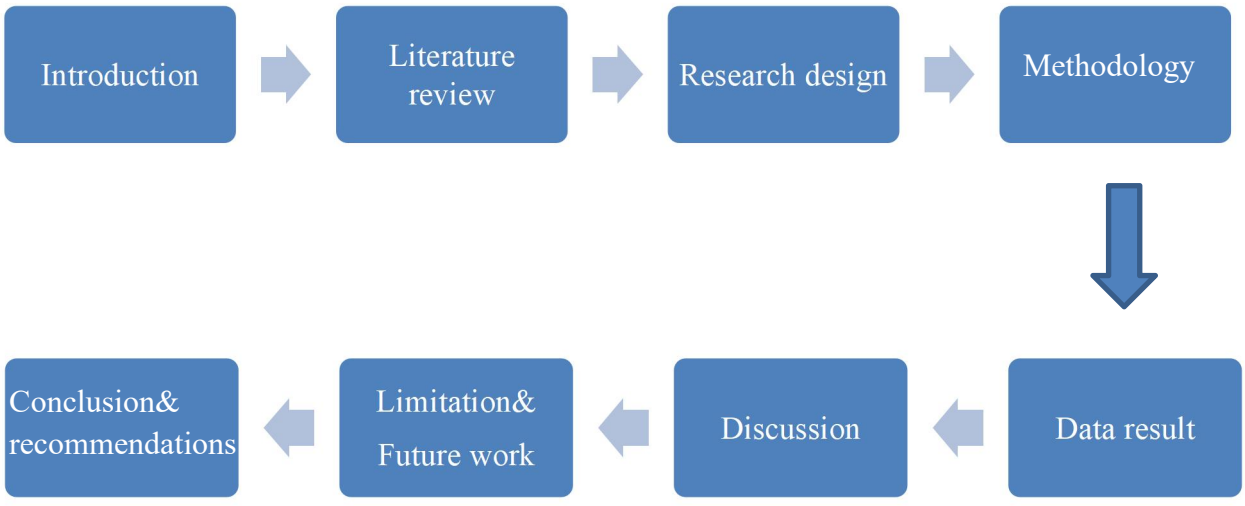

Figure 1.2: Dissertation structure

CHAPTER 2

Literature review

To learn the relevant articles, the investigation was performed in valid databases and by using relevant keywords. The relevant articles were found by searching the databases such as Google Scholar, Science Direct, Scopus, JMIR Publications, ScienceDirect and Taylor & Francis Group. In addition, investigations based on the situation of Chinese residents, so the relevant articles from Chinese databases like CNKI, and the Wanfang database also needed to be concluded.

Then, for selecting relevant articles, it used the combination of several keywords that were effective in the selection of relevant articles. These keywords included Mobile Health + community, Mobile health + Effectiveness, Mobile Health + TAM, Mobile Health + SOR, Mobile health + post Covid-19 era, Community health service + TAM, TAM + SOR. Finally, 64 related articles were found.

2.1. Main concept

2.1.1. Mobile health and application

Mobile health is the aspect of e-health combined with smartphone technology. It is used for the practice of medicine and public health through digital devices (Adibi, 2015). Defined by the World Health Organization (WHO), mobile health (mHealth) is “an area of electronic health (eHealth) that provides health services and information via mobile technologies such as mobile phones and PDAs” (Källander et al., 2013), including patient and personal digital monitoring assistants and other wireless devices (Erfannia et al., 2020).

The popularity and accessibility of mobile health (mHealth) technologies and applications are increasing, and portable devices such as wearables can provide data monitoring assistance for the popularity of mHealth.(Ye, J., & Ma, Q.,2021). The applicable scenarios of mobile health include daily health management, monitoring of endemic and common diseases, online

diagnosis and treatment, registration, and monitoring of common diseases, etc, which has become the trend of medical and health reform and development in this era (Han et al.,2016). Even though there is a huge number of mobile health apps in the market, the location dispersal of each health centers makes the mobile platforms hard to form a universal application, so the residents usually use a specific official account on We chat or Ali pay to get health services.

2.1.2. Community-oriented primary care

Community-oriented primary care can be described as the provision of primary care services to a defined community, coupled with continuously effective and appropriate service adjustments to systematically identify and address major health problems based on the local community health situation (IOM, 1984). It also develops towards the goal of promoting multi-stakeholder integration in a holistic way, including individuals, families, community and social.(Iosti, 2020).

At this stage, community health service institutions are one of the main health service providers. Nowadays, China has formed its distinctive practice models based on local conditions. However, in general, the primary care teams have formed by general practitioners and nurses who are the main staff who provides community health services.

2.1.3. The potential users

For reducing face-to-face contact, the public hospital has been required to follow strict rules in the medical attention process, so people feel uneasy seeing a doctor. In terms of the number of diagnosis and treatments, according to the 2021 Chinese Health Statistics Yearbook, both public and private hospitals have been hit hard by the epidemic. The total number of diagnosis and treatments in 2020 reached 3.3 billion, an overall -14% year-on-year. And the increase of primary care institutions in 2020 has shown that community health services could be provided to more residents(National Health Commission of PRC,2021). Additionally, the scale of Chinese Internet users reached 1.032 billion in 2021, and the scale of online medical users reached 298 million based on the data from CNNIC (2022). This data has proved that mobile health and community health center could absorb a small number of people who would

otherwise have used public hospitals during this specific period.

Based on the usual services, the objective of community health centers is mainly to deal with a sub-healthy population and patients with chronic diseases. In 2020, the number of sub-health people in China accounted for about 70% of the total population (Lyn, et al., 2020). From 2013 to 2018, the healthcare expenditure per Chinese resident increased each year, from 912.1 RMB increased to 1685.2 RMB (Liao et al., 2021). Moreover, from the threat of the epidemic, residents have gradually increased their awareness of health management, which proves that the potential users of mobile health management can be extensive.

2.1.4. The usage of mobile heath in community health management

In China, the government promotes internet technology combined with community health management. Expert Group described that the combination of internet and community health centers, so that health management services such as health examination, health monitoring, follow-up evaluation, health education, and intervention for community residents can be effectively extended from community health service institutions to families (Wu et al.,2018). During the pandemic, the appointment and injection of the coronavirus vaccine brought into service coverage, and many people lined up overnight to get vaccinated at community hospitals (Li et al., 2022). This research focuses on the usage and intention analysis of the Chinese residents.

2.1.5. Technology Acceptance Model (TAM)

Proposed by Davis Fred D. (1989), “TAM is a classical theory used in predicting and interpreting users’ adoption of and behavior toward information technology” (Deng et al., 2018). The TAM mainly consists of five variables: perceived usefulness(PU), perceived ease of use (PEOU), attitude(ATT), behavioral intention(BI), and actual behavior. Furthermore, perceived usefulness and perceived ease of use have been two determinants that influence a person's attitude toward a certain behavior or technology (Holden & Karsh, 2010). As a mature model has validated by many times, TAM can be effectively applied in a variety of technical scenarios, some of which have been related to mobile health applications such as Internet services and healthcare applications (Rajak & Shaw, 2021). Through many times of

change and development, the final model just illustrated by Figure 2.1:

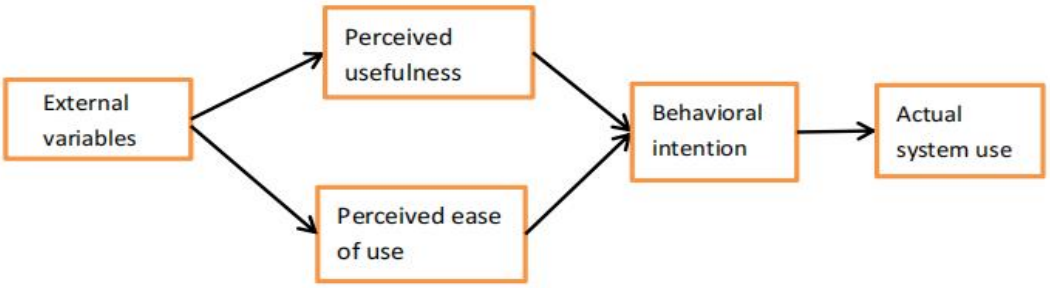

Figure 2.1:TAM (final version)

Source: Working Papers on Information Systems, 2009, Overview of the Technology Acceptance Model:Origins, Developments and Future Directions (p. 12), by Chuttur M.Y., Indiana University, USA. Sprouts,9(37).

2.1.6. Stimulus-Organism-Response Model (SOR)

Stimulus-Organism-Response Model (SOR) was proposed by Mehrabian and Russel(1974) in 'An Approach to Environmental Psychology', from the perspective of environmental psychology and to explain the psychological decision-making process of individuals after receiving external stimuli. Pandita et al. (2021) described that stimulus and response are considered as 'parts of behavior and environment' and changes in the external environment can affect the psychology and emotion of an individual, and lead to behavioral changes. The model is showed by Figure 2.2. The SOR model has been usually used to predict the users' decision-making behavior in the research field of economic management. In recent years, it has also used in mobile health. For example, Shan et al.,(2019) explored how physician information affects patient trust in mobile health based on SOR model and online trust theory, thereby further affecting patient's choice of physician.

Figure 2.2:S-O-R model

2.2. Summary of related research

From the emergence of the Covid-19 epidemic to the present, there was several research

studies on mobile health and community management. The literature review divided into two parts. The first part mainly summarized those articles on the effectiveness of mobile health in primary care and community health management, and those research results provided positive evidence for the hypothesis. This process verified through systematic evaluation, scope review, and controlled trials. It mainly divided the research impact aspects into three parts, including people, specific diseases, and organization&services (Table 2.1). The positive effect can be summarized from the impact of different aspects. Mobile health can bring community health management with effective information acquisition, improvement of service quality and efficiency, and closer relationships between doctors and patients.

In the second part, regarding people's attitudes towards mHealth, on one hand, many studies have adopted models based on theories such as TAM, IDT, and UTAUT2. On the other hand, the SOR model itself can be applied to many behavioral intention studies. These two mature models have been verified many times and have been effectively implemented in various environments such as electronic logistics information systems, clinical information systems, and healthcare. Most studies have shown that perceived usefulness and perceived ease of use are common factors affecting residents' satisfaction and willingness to use (Table 2.2). At the same time, these studies have often added new theories and perspectives based on the TAM model, so the actual content of the research subjects could be better served. The SOR model has no fixed test items like TAM, but there has been some research related to health services. Shan et al. (2019) researched patients' trust and choice of doctors through the SOR model and online trust theory. In addition, Chang et al. (2019) also used SOR and justice theory to analyze the impact of online interaction on the integration of online and offline health services. Finally, there have been few studies on the combination of TAM and SOR models and rarely focus on mobile health, which is also the innovation of this study. Through the innovative model used by Liu and Shi (2021) and Ge et al. (2020) in other research fields, it can be proved that this combined model is effective and applicable.

Research Scope	Author	Main opinions	Difference
The impact towards human	Odendaal et al., （2020）	Mobile health brought new ways for health workers to collaborate with each other and deliver services, and build new interactions with clients and communities.	This part of the research has mainly reflected the impact on people, who could be divided into medical staff and patients. It has changed their feelings and experiences in the process of diagnosis, the relationship between doctors and patients and the way of getting medical information.
	Ramirez et al.,(2016)	Mobile health apps were considered the most useful function for providing patients with health knowledge and general information about medical conditions. At the same time, users showed strong interest in managing diseases and improving their health conditions through mobile health technology.	
	Kampmeijer et al., (2016)	E-health and m-health tools were correlated in health promotion and primary prevention in elders, and the successful use of e-health/m-health tools was influenced greatly by the elders' motivation and support that the elders received.	
The impact towards disease	Resnick et al., (2021)	In a primary care setting, mobile applications can be set based on cancer prevention goals. Participants have demonstrated high availability, acceptability, and engagement when using the app, and their feedback showed the impact on health behaviors.	This part of the research has mainly reflected the impact on a specific disease, for example the chronic disease, hypertension. Mainly by control experiment, these researches have shown the
	Wang et al.,(2017)	The application of mhealth D2C model strengthened the control of chronic diseases in the community, the self-management and knowledge, improving the quality of life of patients in the community.	

	Li et al., (2022)	Through controlled experiments, the continuation of effective clinical care for elderly patients with stable coronary heart disease played an important role in daily monitoring, improving disease cognition, and improving the quality of patient prognosis.	effectiveness of mobile health in long-term treatment and self-management, improving the quality of life of patients.
The impact towards organization and service	Godinho et al., (2020)	Mobile Health promoted Integrated People-Centred Health Services by: continuously simplifying access to health services, optimizing the deployment of services and staff, increasing affordability and accessibility of services; strengthening the governance of clinical care level, and promoting systemic improvement.	This part of the research has mainly reflected the impact on organization operation and its services, which focuses on the macro level. Improved top-level design, business model and service process, the operation model that mobile health applied in primary care has strengthened the service-providing ability of the organization.
	Peng et al., (2021)	The community health service center carried out reforms and innovations in technical architecture design, business model, service delivery, etc., It concluded the effects: it can help break through the space limitations and accurately connect with family doctors.	
	Free et al., (2013)	Mobile health interventions could help healthcare providers modestly improve certain aspects of clinical diagnosis and management. But interventions also need to be designed and developed based on different social contexts, and interventions combining mHealth and traditional approaches should consider in the future.	

Table 2.1:mHealth impact towards people, specific diseases and organization&services

Author	Methodology	Main opinions
Rajak & Shaw, (2021)	TAM and extend items	Expanded on TAM, the research model confirmed that mHealth adoption has a greater impact on social influence, behavioral intention and trust, and the model showed the high predictive capability of mHealth service adoption intention and its impact.
Birkmeyer et al., (2021)	TAM and extend model(UTAUT)	TAM was a versatile model that could be extended and adjusted according to the research context. The attitude and satisfaction of users towards mHealth was the core factor for the success of mHealth. And user satisfaction had a strong positive impact on continued use intention.
Deng et al., (2018)	TAM and extend items	Perceived usefulness, perceived ease of use and trust had a positive relationship with the adoption of mHealth, but privacy and performance risks had negative impacts.
Ge et al., (2020)	SOR and TAM	Trust, perceived usefulness and perceived ease of use had a positive relationship with mHealth adoption, but privacy and performance risks have negative impacts. Users' perceived ease of use and perceived usefulness were directly affected by teachers' technical support. And users' perception of learning content could improve by optimizing teachers' cognitive and technical behaviors.
Liu & Shi, (2021)	MOA and TAM based on SOR	Among the influencing factors of behavioral intentions： In the stimulus factors, consumers' motivation was the dominant factor; In the organism factors, consumers' perception of the usefulness and ease of use of sports tourism played a key role, while the perceived risk had a negative effect.

Table 2.2: The related model used in mHealth

Based on these articles two general points are worth highlighting:

1) the effectiveness of mobile health has been proven in different aspects.

2) as maturity models, TAM and SOR have both been used to study many consumer technology products/services and for some cases of mobile health services. But there is limited research using the two model for community mobile health.

CHAPTER 3

Research design

3.1. Research model

The research aimed to explore how community mobile health affects residents' intention of health management activities. It focused on SOR theory as the research framework, combining the TAM model to construct a new model as shown in Figure 3. The core concept was that individuals changed mentally towards community mobile health after being stimulated by external and internal factors, followed by the behavior intention in community mobile health.

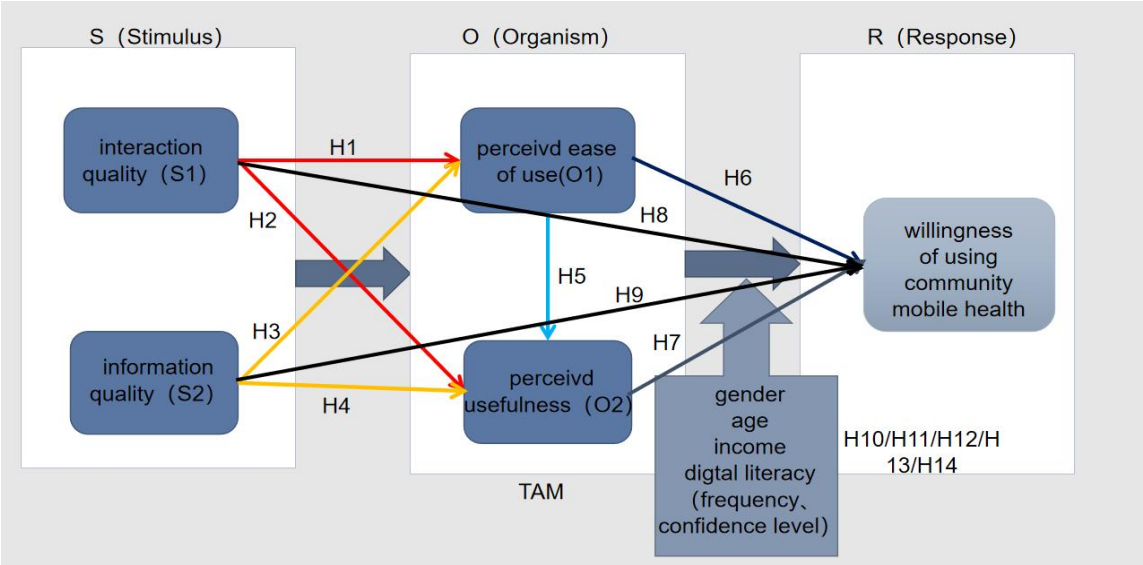

Figure 3: Research model

3.2. Variables

3.2.1. Stimulus variables

In this study, mobile health as an external stimulus was also equivalent to an external variable, to affect resident attitude and usage intention toward community health management. It was the first step where two models could integrate. Due to the characteristics of mHealth and the lack of valid measurement (Oppong et al., 2021), a tool for measuring and predicting the

quality of mHealth services has developed by Akter et al.(2013a), which worked for developing economies. The three key mHealth service quality dimensions have included system quality, interaction quality and information quality.

System quality has referred to the user's perceptions of the technical level of communication. And information quality could be defined as the degree to which a service helps complete a particular task (Motamarri et al., 2014). Finally, “Interaction quality indicates the quality of the interaction and dyadic interplay between a service provider and a user” (Akter et al., 2013a). But as mentioned before, TAM has designed perceived usefulness and perceived ease of use as measure items of user attitude, to explain the relationship between attitudes, usage intentions, and actual application usage of a particular technology application system (Kim & Hahn, 2012). Those indicators were similar to measurement items of system quality. So, system quality has not been included in stimulus variables. Akter, Ray, and D’Ambra (2013b) pointed out that service quality and trust results were important for mHealth services, which had a strong impact on continued use intentions. So, interaction quality and information quality have affected the residents’ intention to use. In summary, taking the two indicators for evaluating the quality of mobile health services as the content of the 'S' framework, this research tried to analyze the stimulus factors of community mobile health management behavior deeply.

3.2.2. Organism variables

In the "O" frame part, perceived usefulness and perceived ease of use based on TAM have been selected to represent the individual's psychology and cognition. Perceived usefulness in this paper refers to the individual's perceived effectiveness of mobile health in improving community health management, while perceived ease of use refers to the ease of individual participation in the process of community mobile health management. Meanwhile, Li et al.(2008) found that there is a significant and stable correlation between perceived ease of use and perceived usefulness.

3.2.3. Response variables

Lastly, Under the joint action of 'S' and 'O', individuals have avoidance or approach intention

to community health management, which means the effect of the willingness to use, to complete the individual community health management behavioral response in the "R" part.

3.2.4. Moderator variables

In this research, three basic demographic survey items, including age, gender, and average monthly income, were selected and included in the research on the effect factors of willingness to use community mobile health. At the same time, this research focused on an online platform, and the digital literacy level of residents also had an impact on the willingness to use community mobile health. “Digital literacy refers to the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills” (van Kessel et al., 2022). Kuek, A., & Hakkennes, S.(2020) found Digital literacy has most commonly assessed by measuring two aspects of users, frequency of use and level of confidence, using Likert-style scales. So, the moderator variable includes four items and five questions, in which digital literacy would set two questions about frequency of using digital devices and confidence level of digital capacity respectively.

3.3. Research hypotheses

In this regard, the research hypothesize that:

- H1 The interaction quality positively affects the perceived ease of use of community mobile health.
- H2 The interaction quality positively affects the perceived usefulness of community mobile health.
- H3 The information quality positively affects the perceived ease of use of community mobile health.
- H4 The information quality positively affects the perceived usefulness of community mobile health.
- H5 Perceived ease of use significantly affects perceived usefulness
- H6 Residents' perceived ease of use positively affects their intention to use community mobile health

- H7 Residents' perceived usefulness positively affects their intention to use community mobile health
- H8 The interaction quality positively affects their intention to use community mobile health.
- H9 The information quality positively affects their intention to use community mobile health.
- H10 There are significant differences in the willingness to use community mobile health among residents of different genders.
- H11 There are significant differences in the willingness to use community mobile health among residents of different ages.
- H12 There are significant differences in the willingness to use community mobile health among residents of different average monthly incomes.
- H13 There are significant differences in the willingness to use community mobile health among residents of different frequency of using digital devices.
- H14 There are significant differences in the willingness to use community mobile health among residents of different confidence level of digital capacity.

3.4. Questionnaire design

The demographic characteristics of the respondents were the first part of the questionnaire. The second part consisted of two measurable items that focus on the quality attributes of mHealth services namely, information quality and interaction quality (Akter et al., 2013a), including 15 questions. The third phase contained three measurable items which focused on user perceptions and attitudes toward community mobile health (Davis,1989; Kuek, A., & Hakkennes, S.,2020; Hung &Jen,2012). This part set each three questions for PU and PEOU, and willingness and behavior intention (DU, 2019; Hung &Jen,2012). And the research adopted the average score of those questions as represent for data analysis. The question settings of all observed variables mainly referred to the current status of the use of community mobile health in China (Table 3).

Responses to questions on mHealth service quality, perception and attitude were measured on a five-point Likert scale ranging from 1(strongly disagree) 2(disagree) 3(neutral)

4(agree)5 (strongly agree).

Observation variable	Items	Reference source
Interaction Quality	INTQ1. Physicians are always willing to help me INTQ2. They provide service right the first time INTQ3.They show interest to solve my problems INTQ4. Their behavior instills confidence in me INTQ5. I feel safe while consulting with them INTQ6. They are competent in providing service INTQ7. They understand my specific needs INTQ8. They have my best interests at heart INTQ9. They give me individual care	Akter et al(2013)/Oppong et al., (2021)
Information Quality	INFQ1. mHealth information serves its purpose very well INFQ2. Having information from it has been worthwhile INFQ3. Overall, this information service is useful to me INFQ4. I feel helpful and hopeful as a result of having information INFQ5. I feel encouraged having this information INFQ6. I believe my future health will improve having this information service	Akter et al(2013)/Oppong et al., (2021)
Perceived usefulness (PU)	PU1. Using community mobile health platform or APP would enable me to get services more quickly and directly PU2. Using community mobile health platform or APP make it easier for me to satisfy my needs PU3. Overall, using community mobile health platform or APP will be useful in managing my health	Davis（1989）/Kuek, A., & Hakkennes, S. (2020)/Hung &Jen （2012）
Perceived ease of use (PEOU)	PEOU1. Learning to use community mobile health platform or APP would be easy for me. PEOU2. My interaction with community mobile health platform or APP would be clear and understandable PEOU3. I would find it easy to get community mobile health platform or APP to do what I want it to do	Davis（1989）/Kuek, A., & Hakkennes, S. (2020)
Usage intention(UI)	UI1. I think that it's a good idea to use community mobile health platform or APP UI2. I think that I have a high probability of using community mobile health platform or APP when I need community health service. UI3. I intend to use community mobile health platform or APP in the future	Du（2019）/ Hung &Jen （2012）

Table 3: Questionnaire items and sources

CHAPTER 4

Methodology

4.1. Research content

4.1.1. Research subject

Considering the purpose of this research, the sample was selected as Chinese residents having digital literacy and experience in community mobile health management. According to the selection of research subjects, this research adopted quantitative research and obtained a large amount of data through questionnaires to verify the hypothesis.

4.1.2. Research method

The research used the literature analysis method and questionnaire survey method. The literature research mainly referred to the different researches of mobile health and community health management in the world and the development of research models in usage willingness of mobile health. In addition, the countermeasures and suggestions for the usage of mobile health and community health services built the theoretical foundation for the following research.

According to the advice from related-field experts and the research model, the questionnaire was designed on the utilization of mobile health services in community health management and the attitude towards community mobile health services. Then the questionnaire was modified and improved after conducting a small-scale pre-test, and the survey tried to collect 400-500 questionnaires to get the data.

4.2. Questionnaire survey

4.2.1. Pre test questionnaire survey

To ensure that the design of the questionnaire was reasonable and effective, this paper conducted a preliminary survey of the questionnaire. The purpose of the pre-test was mainly

to detect the language expression of the initial questionnaire, to revise and improve the questionnaire according to the respondents' feedback from the questionnaire. A total of 10 valid questionnaires were collected in the preliminary survey. And technical terms that were not easy to understand were revised according to the opinions of respondents. The revised questionnaire was used as a formal questionnaire.

4.2.2. Questionnaire distribution and collection

Both online and offline questionnaires were selected for this questionnaire survey, but due to the impact of Covid-19, online questionnaires were the main form of questionnaire collection. The online survey method, mainly relied on questionnaire software to design questionnaires through the wjx platform and send links to major social platforms to obtain data. At the same time, I went to Guangzhou Dadong Street Community Health Center, Wushan Street Community Health Center, Guangta Street Community Health Center, Tongde Street Community Health Center and the surrounding of COVID-19 test spot to distribute questionnaires to the public, for ensuring validity and accuracy of questionnaire data as much as possible.

The questionnaire was distributed from May to June, and a total of 509 questionnaires were collected. After excluding invalid data with abnormal filling time, lack of consistency, and not passing the screening question, a total of 451 valid samples were obtained, with an effective rate of 88.6%. Among the valid samples, from the perspective of the gender ratio of the respondents, males accounted for 40.8% and females accounted for 59.2%. From the perspective of age ratio, respondents aged 21-30 have the highest proportion, accounting for 42.4%. From the perspective of average monthly income, 32.8% of respondents had an average monthly income of less than 3,000 RMB, and 22% of respondents had an average monthly income of between 5001-7000 RMB. From the frequency of using digital devices, 38.6% of the respondents often used it, 49.7% of the respondents used it very often, and 53.2% of the respondents said that they were confident in using online information and resource to make decisions, demonstrating a high level of digital capacity. Overall, it showed that audience portraits of community mobile health in this survey were young, middle-income, and have high digital literacy.

4.3. Data analysis

This study mainly used SPSS 26.0 and AMOS 25.0 software. Firstly, descriptive analysis, independent Samples Test, and one-way ANOVA were used to show the basic description of different samples and the difference analysis in impact factors of usage intention. Secondly, Cronbach's c coefficient method, exploratory factor analysis, and confirmatory factor analysis were used to test the reliability and validity of latent variables. Lastly, the structural equation model was used to analyze and test the relationship between each potential variable, including the fitting of the structural model and the significance test of covariance analysis, path analysis, mediation effect analysis and so on.

CHAPTER 5

Result

5.1. Descriptive analysis of offline questionnaire

Through the below Table 5.1, it was found that the offline sample size was 50 people, including 15 males, accounting for 30%, and 35 females, accounting for 75%. About the age, it was found that each 4 people in the group of under 20 years old and 31-40 years old, both accounting for 8% ; 21-30 years old group included 8 people, accounting for 16%; 41-50 years old group included 18 people, accounting for 36%; 51-60 years old group included 10 people, accounting for 20%; and 6 people elder than 60 yeas old, accounting for 12%.The sample was dominated by female and middle-aged people(41-60 years old).

About the average monthly income, the group of less than 3000 RMB included 11 people, accounting for 22%; each 9 people in the group of 3001 to 5000 RMB and 5001 to 7000 RMB, both accounting for 18%; group of 7001 to 9000 RMB included 8 people, accounting for 16%; and 6 people income more than 9000 RMB, accounting for 26%.

About the frequency of using the digital devices, 2 people rarely used digital devices, accounting for 4%; 10 people used that sometimes, accounting for 20%; 18 people often used devices, accounting for 36%; and 20 people used digital devices very often, accounting for 40%. About the confidence level in digital capacity, 2 people disagreed that they have confidence, accounting for 4%; 7 people showed neutral attitude of confidence in digital capacity, accounting for 14%; 24 people agreed that they have confidence in their digital capacity, accounting for 48%; and 17 people strongly agreed that they have confidence in digital capacity, accounting for 34%. The usage frequency of this survey was mostly distributed between often and very often. Meanwhile, most people showed confidence in digital capacity, and the result was related to the theme of this research, which was community mobile health.

Variable	Type	Frequency	percent（%）
Gender	male	15	30
	female	35	70
Age	≤20 years old	4	8
	21-30 years old	8	16
	31-40 years old	4	8
	41-50 years old	18	36
	51-60 years old	10	20
	＞60 years old	6	12
average monthly income	≤3000￥	11	22
	3001-5000￥	9	18
	5000-7000￥	9	18
	7000-9000￥	8	16
	≥9000￥	13	26
frequency of using digital devices	never	0	0
	rarely	2	4
	sometimes	10	20
	often	18	36
	very often	20	40
confidence level in digital capacity	strongly disagree	0	0
	disagree	2	4
	neutral	7	14
	agree	24	48
	strongly agree	17	34

Table 5.1: Description of offline residents

5.2. Descriptive analysis of online questionnaire

Through the below Table 5.2, it was found that the offline sample size was 401 people, including 169 males, accounting for 42.1%, and 232 females, accounting for 57.9%. About the age, it was found that 55 people in the group of under 20 years old,accounting for 13.7%; 21-30 years old group included 183 people, accounting for 45.6%; 31-40 years old group include 69 people, accounting for 17.2%; 41-50 years old group included 52 people, accounting for 13%; 51-60 years old group included 26 people, accounting for 6.5%; and 16 people elder than 60 yeas old, accounting for 4%.The sample was dominated by female and youth people(21-30 years old).

About the average monthly income, the group of less than 3000 RMB included 137 people, accounting for 34.2%; 80 people in the group of 3001 to 5000 RMB, accounting for 20%; 90 people in the group of 5001 to 7000 RMB, accounting for 22.4%; group of 7001 to 9000

RMB included 62 people, accounting for 15.5%; and 32 people income more than 9000 RMB, accounting for 8%.

About the frequency of using the digital devices, 7 people rarely used digital devices, accounting for 1.7%; 34 people used that sometimes, accounting for 8.5%; 156 people often use devices,accounting for 38.9%; and 204 people used digital devices very often, accounting for 50.9%. About the confidence level in digital literacy, 10 people disagreed that they have confidence, accounting for 2.5%; 86 people showed neutral attitude of confidence in digital capacity, accounting for 21.4%; 216 people agreed that they have confidence in their digital capacity, accounting for 53.9%; and 89 people strongly agreed that they have confidence in digital capacity, accounting for 22.2%. The usage frequency of this survey was mostly distributed between often and very often, meanwhile most of people showed confidence in digital capacity, which was similar to the analysis of offline data.

Variable	Type	Frequency	percent（%）
Gender	male	169	42.1
	female	232	57.9
Age	≤20 years old	55	13.7
	21-30 years old	183	45.6
	31-40 years old	69	17.2
	41-50 years old	52	13
	51-60 years old	26	6.5
	＞60 years old	16	4
average monthly income	≤3000￥	137	34.2
	3001-5000￥	80	20
	5000-7000￥	90	22.4
	7000-9000￥	62	15.5
	≥9000￥	32	8
frequency of using digital devices	never	0	0
	rarely	7	1.7
	sometimes	34	8.5
	often	156	38.9
	very often	204	50.9
confidence level in digital capacity	strongly disagree	0	0
	disagree	10	2.5
	neutral	86	21.4
	agree	216	53.9
	strongly agree	89	22.2

Table 5.2: Description of offline residents

5.3. Offline and online data comparison

An independent sample t-test was used to test whether two samples were from the same population. To study whether there were differences in demographic characteristics between offline and online data, the research conducted a difference analysis of multiple demographic survey items and data collection methods through independent samples T-test. The results are shown in Table 5.3.

Firstly, except for gender, other items passed Levene's Test for Equality of Variances, $P>0.05$. And gender selected the t-test value under the equal variances not assumed, $P=0.087>0.05$, the difference was not statistically significant, meaning that the gender difference between offline data and online data was not considered statistically significant. Lastly, the result was found by independent sample T-test for the items of age, average monthly income and frequency of using digital devices, $P<0.05$. So it was considered that the differences in age, average monthly income and frequency of using digital devices between online data and offline data were statistically significant. About the item of confidence level in digital literacy, $P=0.144>0.05$, the difference was not significant, so it could be considered that difference of confidence level in digital capacity between offline data and online data was not statistically significant.

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
gender	Equal variances assumed	22.323	0.000	1.649	449	0.100
	Equal variances not assumed			1.736	63.772	0.087
age	Equal variances assumed	0.917	0.339	5.912	449	0.000
	Equal variances not assumed			5.339	58.79	0.000
average monthly income	Equal variances assumed	2.742	0.098	3.138	449	0.002
	Equal variances not assumed			2.802	58.496	0.007
the frequency of using digital devices	Equal variances assumed	1.177	0.279	-2.184	449	0.029
	Equal variances not assumed			-1.95	58.504	0.056
confidence level in digital capacity	Equal variances assumed	1.304	0.254	1.464	449	0.144
	Equal variances not assumed			1.367	59.711	0.177

Table 5.3: Independent Samples Test result

5.4. Analysis of the Influence of Personal Factors on usage intention

Since the control variables (gender, age, income, frequency of use, digital capacity) in this research were categorical data, and the usage intention was quantitative data, one-way ANOVA was used to illustrate the effect of the control variables on the usage intention of the dependent variable. The next step could only be done after passing the homogeneity of variance test, which means the $P > 0.05$. The results are shown in Table 5.4. Only the frequency of using digital devices and the confidence level in digital capacity passed the test, $P > 0.05$, meaning that the variance was equal, and the other three items should choose Welch's method to get more results.

Test of Homogeneity of Variances

Variables	Levene Statistic	df1	df2	Sig.
Gender	5.529	1	449	0.019
Age	5.285	5	445	0.000
Average monthly income	2.990	4	446	0.019
Frequency of using digital devices	0.124	3	447	0.946
Confidence level in digital capacity	1.739	3	447	0.158

Table 5.4: Test result of Homogeneity of Variances

From Table 5.5, it can be seen that gender and age have an impact on the willingness to use, both P <0.05, indicating that women have higher usage intention than men, and the people between the ages of 21 and 30 have the strongest usage intention, and the 51 to 60-year-old group is next highest. About the average monthly income, P>0.05, which meant different incomes would not affect the usage intention.

Robust Tests of Equality of Means				
Variables		Mean	Statistica	Sig.
Gender	male	3.699	14.322	0.000
	female	4.040		
Age	≤20 years old	3.695	2.795	0.020
	21-30 years old	4.068		
	31-40 years old	3.722		
	41-50 years old	3.743		
	51-60 years old	4.019		
	＞60 years old	3.909		
Average monthly income	＜3000	4.016	1.256	0.289
	3001-5000	3.861		
	5001-7000	3.869		
	7001-9000	3.729		
	＞9000	3.941		

Table 5.5 Robust Tests of Equality of Means

For the two questions about digital literacy, the different frequencies of using digital devices were not affected usage intention, P>0.05, but different levels of confidence affected the usage intention, and the people who were very confident in their digital capacity level had the highest willingness to use.(Table 5.6)

Variables		Mean	AVONA	
			F	P
Frequency of using digital devices	rarely	3.667	0.347	0.791
	sometimes	3.977		
	often	3.876		
	very often	3.915		
Confidence level in digital capacity	disagree	3.389	14.592	0.000
	neutral	3.523		
	agree	3.889		
	strongly agree	4.318		

Table 5.6: AVONA Result

5.5. Reliability and Validity Test

5.5.1. Reliability Test

In this study, Cronbach's α coefficient method was used to test the reliability of each variable, and the results found that the Cronbach's α of each variable was greater than 0.8, indicating that each variable had good internal consistency.(Table.5.7)

Variables	Number of items	Cronbach's α
Interaction quality(INTQ)	9	0.911
Information quality(INFQ)	6	0.885
Perceived Usefulness(PU)	3	0.821
Perceived ease of use(PEOU)	3	0.828
Usage willingness and intention(UI)	3	0.859

Table 5.7: Reliability Test Result

5.5.2. Validity Test

The results of exploratory factor analysis showed that the KMO value was 0.930, and then the fixed 5 factors and the maximum variance method were used to extract common factors. The total variance explained by extracted five factors was 66.560%, indicating that the five factors selected in this study have good representation, the common degree of each measurement variable was above 0.5(Table 5.8). The results of the exploratory factor analysis preliminary showed that the construct validity of each variable met the research criterion.

Rotated Component Matrix					
	Component				
	1	2	3	4	5
interaction2	0.785				
interaction8	0.759				
interaction1	0.751				
interaction4	0.749				
interaction7	0.741				
interaction6	0.728				
interaction9	0.699				
interaction3	0.696				
interaction5	0.674				
information3		0.773			
information4		0.77			
information2		0.761			
information6		0.751			
information1		0.723			
information5		0.705			
UI1			0.8		
UI2			0.795		
UI3			0.786		
PEOU3				0.832	
PEOU2				0.782	
PEOU1				0.755	
PU1					0.793
PU3					0.78
PU2					0.751

Table 5.8: Rotated Component Matrix

Confirmatory factor analysis was performed in this research. As the general method of CFA, Structural Equation Modelling (SEM) could build and test diverse and multiple relationships and provided information about the degree of fit of the tested model, and the structural paths were estimated to test the hypotheses of the research (Byrne, 2011; Oppong et al., 2021). The model results showed that an acceptable fit was established and a satisfactory level of validity was achieved. Finally, the results showed that $X2/df = 1.448$, RMSEA = 0.032, GFI = 0.943, NFI = 0.940 IFI = 0.981 TLI = 0.978 CFI = 0.981 RMR = 0.03, indicating that the validity of model was good. As shown in Table 5.9, the standardized loading coefficients of each observed variable were all above 0.5, reaching a significant level, indicating that the correlation between each dimension and the observed variables it constituted was high. The

CR value was above 0.8, and the AVE was above 0.5. It showed that the subordination relationship between each variable and its constituent indicators was good, and each variable had good convergent validity.

Latent variable	observation variable	CFA loading	CR	AVE
Interaction quality	interaction9	0.693	0.9109	0.532
	interaction8	0.727		
	interaction7	0.750		
	interaction6	0.720		
	interaction5	0.695		
	interaction4	0.723		
	interaction3	0.733		
	interaction2	0.762		
	interaction1	0.758		
Information quality	information6	0.760	0.8855	0.5635
	information5	0.703		
	information4	0.734		
	information3	0.789		
	information2	0.769		
	information1	0.746		
PEUO	PEOU1	0.750	0.829	0.618
	PEOU2	0.812		
	PEOU3	0.795		
PU	PU3	0.741	0.8211	0.6049
	PU2	0.790		
	PU1	0.801		
UI	UI1	0.793	0.8593	0.6709
	UI2	0.854		
	UI3	0.809		

Table 5.9: Aggregation validity of the measurement model

The discrimination validity between variables mainly used the correlation coefficient of each variable to compare with its AVE square root. If the absolute value of the correlation coefficient between the variable and other variables was less than the AVE square root of the variable, it meant that the internal correlation was greater than the external correlation, so the variables had good discriminant validity. It could be found that the absolute value of the correlation coefficient between each variable and other variables was less than the square root of the AVE of the variable, indicating that the discrimination validity between the variables in

this research was good (Table 5.10).

	Mean	PU	PEOU	INFQ	INTQ	UI
PU	3.9431	(0.778)				
PEOU	3.9143	0.611	(0.786)			
INFQ	3.9069	0.507	0.506	(0.751)		
INTQ	3.8271	0.490	0.400	0.495	(0.729)	
UI	3.901	0.585	0.573	0.567	0.443	(0.819)

Note: ✳✳ the value inside the () is square root of the AVE

Table 5.10: Discrimination validity of the measurement model

From the perspective of the stimulus factors of community mobile health, the information quality and interaction quality were at a relatively high level, and the mean of information quality was 3.91, indicating that residents had a higher degree of recognition of information services. From the perspective of the organism factors, PEOU and PU were also at relatively high levels, and the mean of perceived usefulness was 3.94, which was the highest among all variables, indicating that residents think that community mobile health provided valuable services. About the response factors, residents' usage intention was still strong, which was inseparable from the restrictions on medical treatment conditions in hospitals and the implementation of primary health policies under the current epidemic situation.

5.6. Analysis of Structural Equation Modelling (SEM)

5.6.1. Model building

In this research, the structural equation model was used to test the influence relationship between latent variables. Through the theoretical model built in Chapter 3 and the AMOS25.0 software, the initial structural equation model framework constructed is shown in Figure 5.1.

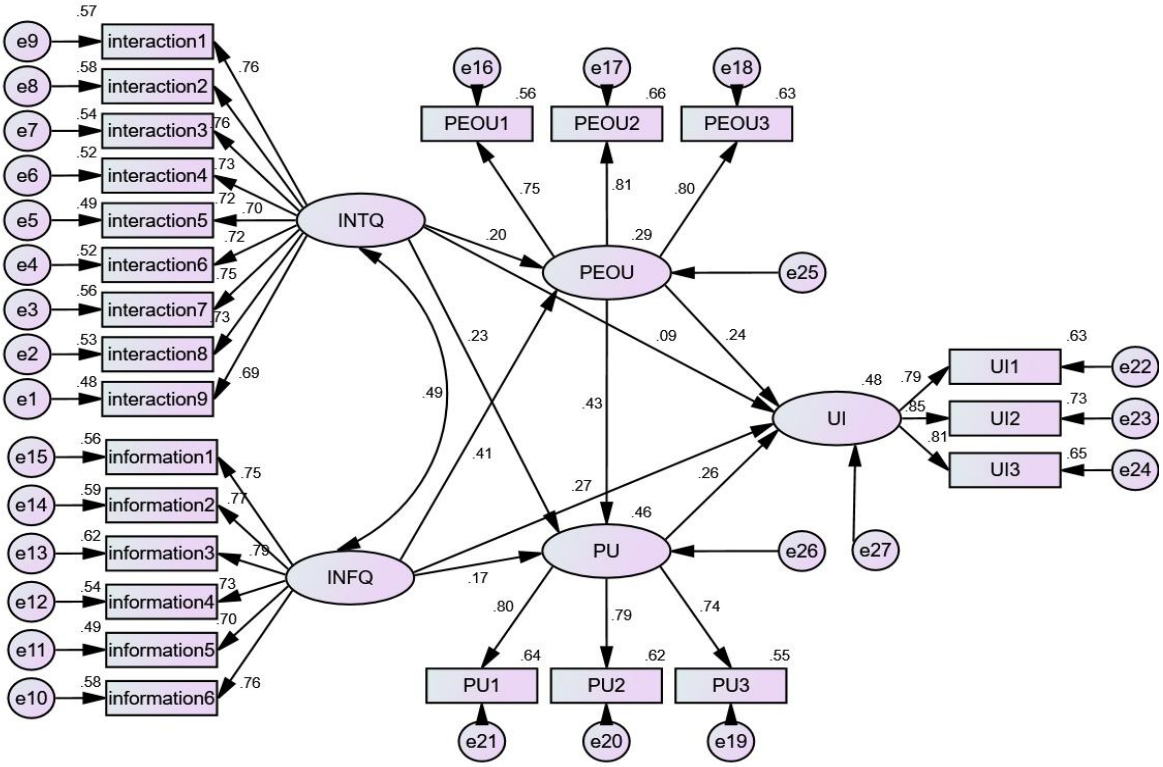

Figure 5.1: structural equation model framework

After inspection, it was found that the overall model fit is good fit (Table 5.11).

Model Fit result

Reference Index	Eligibility criteria	model fit value
X^2/df	＜3	1.448
RMSEA	＜0.05	0.032
GFI	＞0.9	0.943
AGFI	＞0.9	0.929
NFI	＞0.9	0.940
IFI	＞0.9	0.981
TLI	＞0.9	0.978
CFI	＞0.9	0.981

Table 5.11: The initial Model Fit result

Based on the above result, a path test was performed on our initial model. Path analysis mainly observed whether the relationship between variables is significant by the value of the path coefficient. Typically, it considered strong significance in the path relationship when P <

0.05. The path analysis results are shown in Table 5.12 below.

Hypothesis	Path relationship			Path coefficient	P	Result
H1	PU	<---	INTQ	0.232	***	Support
H2	PU	<---	INFQ	0.175	0.004	Support
H3	PEOU	<---	INTQ	0.198	***	Support
H4	PEOU	<---	INFQ	0.408	***	Support
H5	PU	<---	PEOU	0.430	***	Support
H6	UI	<---	PU	0.256	***	Support
H7	UI	<---	PEOU	0.245	***	Support
H8	UI	<---	INTQ	0.085	0.109	Reject
H9	UI	<---	INFQ	0.271	***	Support

Note: '***' mean p＜0.001

Table 5.12: Model path test results

According to the above results, from the perspective of stimulus factors, interaction quality had a significant impact on PU and PEOU, but had no significant impact on UI (β=0.085, p=0.109>0.05), so, H1, H2 were supported, H8 was rejected. Information quality had a significant impact on perceived usefulness, perceived ease of use, and willingness to use, so H3, H4, and H9 were supported. Among the stimulus factors, information quality had the greatest direct effect on usage intention (0.461). From the perspective of organism factors, PEOU and PU had a significant impact on the UI, at the same time, PEOU had a significant impact on PU, so H5, H6, and H7 were supported. Among the organism factors, PEOU had the biggest direct effect on usage intention (0.355), followed by PU (0.256).

5.6.2. Modification

By analyzing Table 13 of the preliminary model path result, it could be found that the interaction quality had no significant impact on the usage intention, so the structural equation model in this research should be modification. Using AMOS25.0 software, the paths with insignificant variable relationships in the model were deleted. After modification, the final model is shown in Figure 5.2.

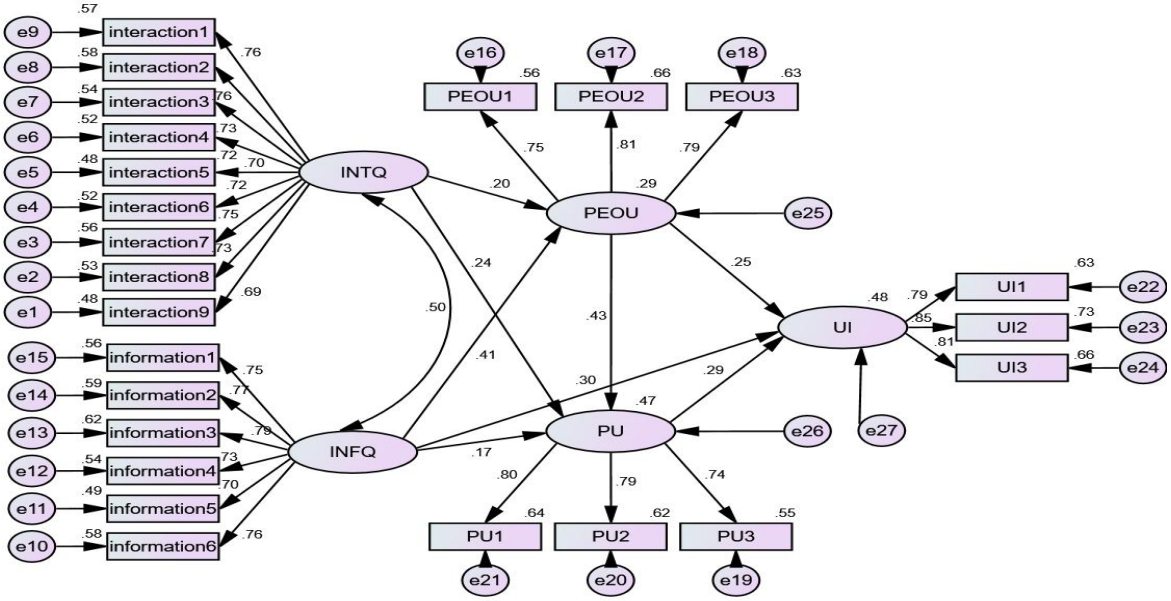

Figure 5.2 Model after Modification

After modification, the model fit result is shown in Table 5.13. But related fit indexes were not changed a lot, indicating that the preliminary model was good. From the explained variance in outcomes, explained rate of the model for PU was 46.6%, the explained rate for PEOU was 28.7%, and the explained rate for community mobile health usage intention was 48.1%. About the total effect of each variable on the intention to use community mobile health, the total effect of information quality among the stimulus factors was the largest (0.461), followed by the interaction quality (0.215). And the total effect of perceived usefulness among the organism factors was the largest (0.256). The second was perceived usefulness (0.245).

Model Fit result

Reference Index	Eligibility criteria	model fit value
X^2/df	＜3	1.453
RMSEA	＜0.05	0.032
GFI	＞0.9	0.942
AGFI	＞0.9	0.929
NFI	＞0.9	0.940
IFI	＞0.9	0.980
TLI	＞0.9	0.978
CFI	＞0.9	0.980

Table 5.13: Modified Model Fit result

5.7. Analysis of intermediary effect

In order to further research the intermediary effect of PU and PEOU between stimulus factors of community mobile health and usage intentions, this research used the Bootstrap method for verification and selected 2000 Bootstrap samples for 95% confidence interval estimation. The results are shown in Table 5.14. It found that the mediating effect of PU and PEOU between information quality and usage intention was significant, with the mediating effect accounting for 9.76% and 21.69% respectively, which were partial mediation. The total mediating effect accounted for 41.21%, and the direct effect accounted for 58.79%, indicating that the direct effect played a dominant role in the process of the influence of the information quality of community mobile health on the usage intention, but the mediating effect could not be ignored.

PU and PEOU had a significant mediating role between interaction quality and usage intention, with mediating effect accounting for 10.23% and 22.79% respectively, which were complete mediation. And the total mediating effect accounted for 60.47%, indicating that the mediating effect played a central role in the process of influencing the interaction quality of community mobile health on the usage intention.

Effect type	Path relationship	Effect sizeβ	LLCI	ULCI	P	Percentage（%）
Total effect1	INTQ→UI	0.215	0.105	0.328	0.001	——
Direct effect1	INTQ→UI	0.085	-0.033	0.205	0.141	39.53%
Total indirect effect1	INTQ→UI	0.130	0.066	0.213	0.001	60.47%
Ind effect1	INTQ→PEOU→UI	0.049	0.009	0.107	0.010	22.79%
Ind effect2	INTQ→PU→UI	0.022	0.006	0.051	0.004	10.23%
Ind effect3	INTQ→PEOU→PU→UI	0.059	0.018	0.129	0.002	27.44%
Total effect2	INFQ→UI	0.461	0.337	0.579	0.001	——
Direct effect2	INFQ→UI	0.271	0.119	0.422	0.001	58.79%
Total indirect effect2	INFQ→UI	0.190	0.110	0.292	0.001	41.21%
Ind effect4	INFQ→PEOU→UI	0.100	0.036	0.194	0.005	21.69%
Ind effect5	INFQ→PU→UI	0.045	0.014	0.100	0.002	9.76%
Ind effect6	INFQ→PEOU→PU→UI	0.045	0.003	0.118	0.024	9.76%

Table 5.14: Mediation effect results

5.8. Hypothesis conclusion

According to the above data analysis results, it was found that among the 14 hypothesis on the influencing factors of community mobile health proposed in Chapter 3, 3 hypothesis were not supported. The specific situation is shown in Table 5.15.

Hypothesis	Hypothesis content	Result
H1	The interaction quality affects the perceived ease of use of community mobile health.	Supported
H2	The interaction quality affects the perceived usefulness of community mobile health.	Supported
H3	The information quality affects the perceived ease of use of community mobile health.	Supported
H4	The information quality affects the perceived usefulness of community mobile health.	Supported
H5	Perceived ease of use significantly affects perceived usefulness	Supported
H6	Residents' perceived ease of use positively affects their intention to use community mobile health	Supported
H7	Residents' perceived usefulness positively affects their intention to use community mobile health	Supported
H8	The interaction quality positively affects their intention to use community mobile health.	Rejected
H9	The information quality positively affects their intention to use community mobile health.	Supported
H10	There are significant differences in the willingness to use community mobile health among residents of different genders	Supported
H11	There are significant differences in the willingness to use community mobile health among residents of different ages	Supported
H12	There are significant differences in the willingness to use community mobile health among residents of different average monthly income	Rejected
H13	There are significant differences in the willingness to use community mobile health among residents of different frequency of using digital devices	Rejected
H14	There are significant differences in the willingness to use community mobile health among residents of different confidence level of digital capacity	Supported

Table 5.15: Hypothesis result

CHAPTER 6

Discussion

Based on the S-O-R model, combined with TAM, this research analyzed the influencing factors and influencing mechanisms of usage intention towards community mobile health under the background of normalized prevention and control of COVID-19. Combined with descriptive statistical analysis, structural equation model testing and intermediary effect analysis, the following conclusions are drawn:

6.1. The discussion about stimulus factors

From the perspective of stimulus factors, information quality is the dominant factor of the intention to use community mobile health. The results of the structural equation model show that the information quality has the biggest total effect on the usage intention. And information quality had a positive impact on usage intention, which is consistent with the research results of Lee et al. (2009) and Oppong et al., (2021). Information quality is the benefit obtained by residents during the service process or by interacting with community mobile health service providers (Akter et al., 2013a). At present, under the situation of the epidemic, community health centers have become the main places for nucleic acid testing. Community mobile health can provide relevant information such as testing time, providing effective information for residents, so that residents' usage intention has also become stronger. At the same time, this research also find that information quality has a positive impact on both perceived ease of use and perceived usefulness, and then indirectly promotes the behavior of community mobile health management. Generally, the higher the information quality provided by the community mobile health platform, the stronger the perceived usefulness of community mobile health in understanding the situation of the epidemic, meeting health needs, and promoting physical and mental health. Furthermore, the simpler and more effective the way of pushing information, the stronger the perceived ease of use towards the platform, thereby enhancing their willingness to use it.

Secondly, interaction quality has not directly affect usage intention, which is an auxiliary factor. Interpersonal interactions that occur in the process of service consumption have a great

impact on the perception of service quality (Akter et al., 2013a). Through the structural equation model, it is found that the interaction quality needs to make decisions after evaluating the perceived usefulness and perceived ease of use of community mobile health. The smoother the communication and interaction with the doctor team during the use process, the higher perceived usefulness and perceived ease of use of the interaction quality. So residents are easier to accept and try community mobile health.

The above results show that the information service provided by the community mobile health platform can provide more valuable services for the residents, while online interaction is still in the stage of development and exploration.

6.2. The discussion about organism factors

Research results show that perceived ease of use has a positive effect on perceived usefulness. When residents think that using the community mobile health platform is very convenient, people do not take too much time to think about how to use the platform, then everyone thinks that the community mobile health is easy to use and helpful. If the community mobile health platform wants to achieve better development and popularization, it must be designed to be simple and fast like other successful mobile health products, then residents naturally think that the community mobile health platform is easy to use.

Research also shows that perceived ease of use and perceived usefulness can promote usage intention of community mobile health. Among all the factors, perceived usefulness has the biggest direct effect on residents' intention to use the community mobile health platform, which to a certain extent reflects the residents' sensitivity to the usefulness of the mobile health services, indicating that the current residents attach great importance to the benefits brought by community mobile health. The platform can provide residents with valuable services and can help them improve their efficiency and health quality, which are more likely to be recognized. The perceived ease of use is the basis for the public's willingness to accept this technology or service. A community mobile health platform with a clear interface and clear logic is more easily recognized.

6.3. The discussion about usage intention

In the background of normalized epidemic prevention and control, residents' intention to use community mobile health is generally at a quite high level. The result of the descriptive statistical analysis shows that the mean of residents' intention to use community mobile health was 3.9. This result mainly comes from two aspects. Firstly, the outbreak, spread, follow-up prevention and control of COVID-19 have caused great changes and impacts on residents' medical treatment methods at different stages, whether it is the national and local policy toward hospitals or the requirement of staying at home. In the early stage of the epidemic, residents who lived in the middle or high-risk areas of COVID-19 were required to stay at home. And hospitals also asked people to hold a negative nucleic acid certificate when seeing a doctor, which made the basic health needs of most residents not met. Mobile health platforms or applications can let residents ignore space restrictions and obtain necessary medical services through online consultation with doctors, online shopping for medicines, etc., which increases residents' intention to use mobile health applications. On the other hand, entering the period of normalization of epidemic prevention and control, as the implementing agency of primary health, the community health center has undertaken vaccination work. And community health center has also formulated measures such as online appointments through the community mobile platform to control the foot traffic, which enables more residents to know and use the community mobile health platform. Furthermore, the increase in usage has also prompted the upgrading and development of community mobile health platforms, to improve residents' experience. In general, residents' usage intention is at a high level because the residents' concept of medical treatment has changed after being affected by COVID-19 and the promotion and upgrading of community mobile health platforms.

6.4. The discussion about personal factors

The research shows that age and gender among personal factors have significant differences in the usage intention of community mobile health, but it is no significant difference in average monthly income. The main reason is that younger people, compared with older people, accept new things from the outside world faster and have fewer concerns. And older people are relatively more cautious and consider more things. So, there are significant differences in the willingness to use community mobile health among residents of different

ages. Additionally, females show higher usage willingness than males. On one hand, it may be the reason that there are more female samples in the whole sample, which will exist some bias in the data analysis. On the other hand, females have higher intentions and actions of self-management than males. Therefore, there are significant differences between genders in intention to use community mobile health. The survey finds that the current community mobile health platform can provide the function of mobile payment in terms of cost, but the price is not much different from going to the community health center to see a doctor. Because the setting of service price provided by the community health center is public welfare. The majority of residents can afford it, so there is no difference in the use willingness between different average monthly income groups.

When it comes to digital literacy, with 5G coming, the Internet and mobile devices have been integrated into people's lives, and digital devices have become more popular. At the same time, during the epidemic period, mobile health technologies such as health codes have become a necessary method to verify people's health status, meaning that residents have high acceptance of mobile health services, so different frequency of using digital devices has no significant differences in the usage intention. However, in terms of confidence level in their digital capabilities, compared with residents with low confidence, residents with a high degree of self-confidence know more about some cutting-edge Internet technologies, which can effectively find and distinguish effective information. Those people have experienced some similar platforms, which are easier and more willing to use the community health platform, so there are differences in the use intention of residents with different confidence levels.

CHAPTER 7

Limitations

Research still had some limitations, which may be surpassed in future work. The selection of the research tools was too narrow. It only involved the questionnaires for ordinary residents, which did not fully cover the relevant groups of community mobile health management. The research did not include information professionals of health care, community medical professionals and platform developers. It meant an underrepresentation of other groups' understanding of community mobile health, usage experience, and views on existing problems. This research cannot provide a comprehensive analysis of the development status of the entire community mobile health but highlighted and deeply explores residents' views.

Due to the small number of elderly people using digital products and their difficulty in filling out questionnaires, in the overall sample, the proportion of people over 60 years old was relatively low, which might have an impact on research results.

CHAPTER 8

Conclusions and Recommendations

8.1. General Conclusions

This dissertation constructs an analysis framework combining TAM and S-O-R and deeply analyzes the impact of interaction quality and information quality of community mobile health services on usage intention. At the same time, the residents' perceived ease of use and perceived usefulness of the community mobile health platform are studied. Using the quantitative method, it demonstrates the relationship between the service quality of platforms, personal factors and residents' willingness to use.

In response to the two research questions raised in this dissertation, residents' willingness to use community mobile health is generally positive. When the epidemic causes pressure on medical service supply, residents' medical service demand can not be satisfied, so those people have had a positive attitude toward using community mobile health services. Furthermore, the perceived ease of use and perceived usefulness of community mobile health applications and platforms positively impact residents' willingness to use. The information quality and interaction quality of medical services provided by platforms also positively impact residents' perceived ease of use and usefulness, which positively influence their usage intention. People should pay more attention to digital literacy. After all, community mobile health is a product based on the development of Internet technology, and people with higher digital literacy will be more willing to use it.

This research focuses on residents' willingness to use community mobile health in the context of the normalization of the epidemic. In the past two years, due to the epidemic, hospitals and community health centers have been under tremendous pressure. At the same time, the population with underserved health needs is large, and the aging problem is worsening, increasing the difficulty for health systems to ensure the supply of basic medical services and the health management of chronic diseases. Community mobile health platforms can provide new solutions and ideas for the above problems, effectively solve the shortcomings of the traditional medical model and relieve the pressure on medical service supply under epidemic prevention and control.

However, it is also necessary to clearly recognize that community mobile health is still in its initial stage, and many service functions need to be improved urgently. The mature operating model cannot complete in a short period, nor can it be accomplished simply by relying on the investment of a related government department or enterprise, but it requires efforts from multiple stakeholders. Therefore, it is necessary to grasp the opportunity and follow the development trend of China's informatization. The demand from residents for community mobile health services requires investigating to secure that it is possible to provide simple and wieldy services timely. Finally, the government and community health workers should actively promote the development of community mobile health and the exploration of new models of digital-based care, improving the quality of life of residents.

8.2. Recommendations

8.2.1. For Community Managers

Community health workers should strengthen the publicity and guidance on community mobile health services and improve online service quality.

In the actual investigation of community mobile health, it finds that some people are not particularly familiar with mobile health care, especially some elderly groups and groups with relatively low digital literacy levels. Therefore, in the actual process, to make community mobile health better popularized and used, it is necessary to increase the publicity of the community mobile health platform and application.

Firstly, from the perspective of medical staff, especially focusing on the managers, various popular methods should use to publicize the use of community mobile health. For example, they can make full use of the doorway and consultation place of the community health centers, through posters, comics and videos and other forms to publicize community mobile health platforms. Collaborating with the government and propaganda department, they can also promote community mobile health through TV, radio, bus, subway, WeChat and Weibo, etc., continuously increasing the awareness and influence of community mobile health.

At the same time, because middle-aged and elderly residents are less able to receive online publicity information, the manager of the community health center can organize a team of

doctors and go to the nearby community. They can conduct public welfare activities such as health lectures, free clinics and vaccinations regularly. During the activities, the worker can demonstrate community mobile health services, improving the attention and trust of middle-aged and elderly residents on the community mobile health platform.

In addition, community health workers need to improve the quality of online services. So that residents can have a good experience through good medical service quality and patient and timely communication. The services should include communication between family doctors and contracted residents, giving interesting and helpful health knowledge regularly. In this way, user satisfaction can improve, and the habit of using community mobile health can gradually develop.

8.2.2. For technology providers

IT companies and digital health solution providers should seek to improve platforms design and optimize user experience.

The research finds that the community mobile health platform has few functions. And its construction and operation rely on the self-management of each community health center and the management by a third-party IT company. This operating model leads to differences in the construction level of community mobile health (Li et al., 2015). So, people pay less attention, and the operation is relatively unfamiliar. As a result, some users cannot find the corresponding function on the platform to obtain services. Therefore, it is important for IT companies and digital health solution providers to strengthen cooperation with community health centers, to provide more useful functions of community mobile health services by paying more attention to the user experience.

Firstly, the community mobile health platform must optimize the function, and design a convenient, clear and concise interface. So users can understand the platform function. Secondly, The companies should highlight the pointed platform function, and increase the number of programs in healthcare services that can complete online. Timely eliminates the platform function used less, focuses on the necessary platform function, and optimizes and upgrades the platform from time to time. Finally, the operation process of seeing a doctor on the community mobile health platform should be simplified, so that the residents can use the

platform conveniently and quickly.

8.2.3. For Health System policy

The government should strengthen policy support for community mobile health.

The development characteristics of community mobile health are the same as the developing characteristics of hospital mobile health service platforms. And the early development will also encounter the problem of low popularization and low utilization. Therefore, the government must give stronger policy support and capital investment for developing community mobile health. On the one hand, preferential policies should introduce timely, which encourage community health centers to cooperate with mobile medical enterprises and related Internet enterprises. Through optimizing the platform function and establishing the information system with interconnection and interoperability, community mobile health is more convenient for doctors and residents to use, making it a more common way to see a doctor. At the same time, by increasing the funds and efforts to train community doctors and continuously improving the interaction quality and information quality, community mobile health could attract residents with high-level but low-priced diagnosis and treatment services. So, more residents can obtain high-quality medical resources and information.

More importantly, the government also needs to establish a system to protect the privacy and security of residents. It should clarify not only the main body of supervision responsibility for online medical services, but also the responsibilities and rights of medical personnel, community health centers, and third-party service providers. Through the legal approach, it maintains the security of medical big data and effectively protects the rights of both medical personnel and residents.

8.3. Future work

Future work about CMHM can be considered for the following aspects:

First, it should expand data collection so that the conclusions or studies conducted which are more representative of the population.

Second, it should cooperate with mobile medical enterprises and IT enterprises. Researchers

can visit mHealth enterprises on the spot, hold discussions with their leaders, and listen to their views on the cooperation between mHealth and community health centers, to gain new knowledge and insights.

Third, it should conduct comparative research trying to identify sub-groups in populations and investigate different contexts and people's willingness to use mobile technologies in them.

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