The Impact of China's Aging Population on The Development of Internet Medical Platforms and Promotion Strategy -- Taking Jingdong Health as An Example

Xiaohan Zhang *

Faculty of Business and Management, Beijing Normal - Hong Kong Baptist University, Zhuhai, China

* Corresponding Author Email: s230001146@mail.uic.edu.cn

Abstract. According to the data, the degree of aging of the Chinese population is continuing to deepen, and the aging society is facing increasing medical demand. As an emerging industry, the Internet medical platform can effectively reduce the pressure of physical hospitals and facilitate people's lives. As a rapidly developing Internet medical platform in China, Jingdong Health has a representative development strategy. Using the UTAUT theoretical model, this article qualitatively analyzes the factors that affect the willingness of Chinese elderly people to use Internet medical platforms. Through a questionnaire survey, this paper finds that performance expectation, social influence, and convenience can improve users' intention to use. However, there are still two factors, effort expectation and perceived risk, which inhibit potential customers' use. By analyzing two types of influencing factors, this study discusses the positive effect of the enhancement of users' willingness to use on the healthy development of Jingdong, evaluates the restricting impact of negative influencing factors on the healthy development of Jingdong, and proposes countermeasures against potential risks, to provide a reference for the sustainable development of Jingdong Health and other Internet medical platforms.

Keywords: Population aging; internet medical platform; UTAUT theoretical model; Jingdong Health.

1. Introduction

By the end of 2024, there were 310 million people aged 60 or above in China and the number has continued to increase since 2018. With the acceleration of the ageing process and the continued impact of COVID-19, the incidence of various chronic diseases continues to rise, resulting in increasing fiscal expenditure on the prevention and treatment of chronic diseases, a trend shown in Figure 1.

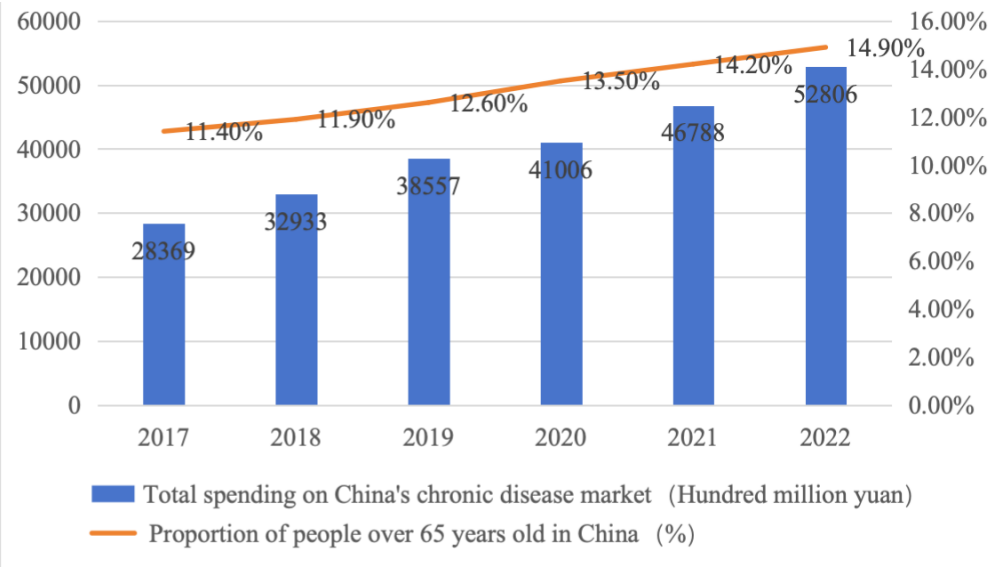

Fig. 1 Elderly population and chronic disease expenditure in China

Data from: Study on the influence of digital intelligence development on enterprise performance in medical service industry [1]

With the rise of the digital economy, the digital service industry is developing rapidly. In 2023, the scale of China's digital economy will exceed 50 trillion-yuan, accounting for more than 40% of GDP. Globally, the digital economy is also booming. According to the World Economic Forum, the digital economy will account for more than 60% of global GDP by 2030.

Internet health care is an important part of the digital economy. On January 15, The General Office of the State Council issued the "Opinions on Developing the Silver Economy to Improve the Well-being of the Elderly" and the "The 14th Five-Year Plan for National Health Informatization". Reflecting the country's concern about ageing, and further standardizing the national health service system. Internet health care is a new medical and health service model, which is deeply integrated with traditional medical and health services with the Internet as the carrier and a variety of information technologies as the means [1]. As a form of telemedicine, Internet medicine has important advantages. Compared with traditional offline medical treatment, Internet medical treatment is more comfortable and convenient, which is conducive to the control of infectious diseases [2].

Internet medicine is an effective way to prevent the spread of diseases, but the current research rarely focuses on the development of Internet medicine and rarely analyzes specific enterprises. As a problem faced by some countries in the world, population aging needs to be actively addressed. In addition, the quantitative research on the elderly's willingness to use the medical platform based on UTAUT theory has fully proved its influencing factors, but the causes behind the influencing factors are still unclear. This paper evaluates the development of Jingdong Health Co., LTD. (hereinafter referred to as Jingdong Health), takes China's aging population as the background, discusses the impact of this phenomenon on the development of Jingdong Health, and puts forward development suggestions for the Internet medical platform against this background.

2. Case Introduction

2.1. Case Background

2.1.1 Industry background

Internet health care has been developing steadily, especially during the 2020 coronavirus pandemic, and the development momentum of Internet health care in China is more vigorous [3]. Due to the convenience brought by Internet medical platforms, more and more people choose to use Internet medicine. By 2024, more than 1.3 billion people in the world will be using digital health, with a market value of approximately $172 billion, and it is forecast to continue to grow in the future [4]. In addition to the social environment increasing the demand for Internet medical care, the diseases faced by the elderly also increase the demand for Internet medical care to a certain extent. Because of the aging population, the number of people facing cognitive decline continues to increase, which requires the addition of many Internets medical platforms. And caring for people with Alzheimer's requires significant resources, which often puts a strain on clinical teams and the healthcare system. In response to such problems, Internet medicine can use remote monitoring equipment to "provide intelligent and personalized assessment" for patients, to break down the pressure of offline hospitals and bring better treatment results [5]. This demand not only promotes the development of Internet medical platforms but also brings huge growth potential to related markets. In 2023, the market size of elderly products has reached 5 trillion yuan and is expected to exceed 100 trillion yuan by 2050, accounting for 33% of GDP [6]. But at present, the number of Internet medical platforms is small, and there is a gap in the market.

2.1.2 Company background

Jingdong Health is a digital health technology enterprise of Jingdong Group, which was founded in 2019 and officially listed on the Hong Kong Stock Exchange in February 2020. Its mission is "medical health enabling technology, health services for all". At present, Jingdong Health has become

the largest drug retail channel with domestic revenue, the largest online medical device retailer with domestic sales, and the most comprehensive online retail channel for national medical and food products, which can meet the comprehensive needs of the elderly. Jingdong Health has focused on the trend of an aging population and specially laid out aging products. Starting from the four directions of professional product supply expansion, aging service transformation and upgrading, diversified service radius extension, and integrated all-channel link opening up, will build a leading domestic one-stop service platform for health and elderly care. Moreover, Jingdong Health has made great achievements in the development process. Data show that from 2020 to 2023, Jingdong Healthy's revenue maintained a compound annual growth rate of 68%. In the first half of 2022, the number of daily consultations reached 250,000 [7]. This shows that Jingdong Health has good development potential.

2.2. Jingdong Health Business Model

2.2.1 Customer analysis

Jingdong Health divides the customer base into three categories based on the customer and Jingdong Health's value proposition. The first category is consumer users who purchase pharmaceutical products or medical services. The second category is pharmacies, pharmaceutical companies, and consumer medical and health institutions that use Jingdong's health platform to achieve the sales advertising and marketing of medical and health products. The third category is hospitals and medical professionals who provide services such as consultation and patient health management on JD's health platform. Jingdong Health has a large customer base, and the number of active users is increasing year by year, as shown in Table 1. However, users aged 26-45 account for more than 60%, which indicates that it is very common for children and grandchildren to use Internet medical care instead of their elders [6]. It can be seen that the number of elderly people that Jingdong Health really faces is small.

Table 1. Statistics on the number of active health users of Jingdong from 2020 to 2024

	2020	2021	2022	2023	2024
Number of active users in Jingdong Health	89.8 million	123 million	169 million	172.3 million	183 million

data from: https://ir.jdhealth.com/sc/ir_report.php

2.2.2 Specific actions

As a leading Internet medical model in the industry, Jingdong Health has upgraded and released AI diagnosis and treatment Assistant 2.0, AI scientific research assistant, AI doctor intelligence and other large model products based on the full scene of Jingdong Internet Hospital [8]. The construction of the model provides the foundation for Jingdong Health to lay out the elderly care field, and Jingdong Health enables the development of Internet medical care from the two directions of physical layout and service layout. In terms of actual goods, Jingdong Health is committed to expanding professional product supply and opening an integrated omni-channel link. Working with global brands to introduce the latest age-friendly products for silver consumers. In terms of services, Jingdong Health is committed to meeting the elderly's comprehensive needs in nutrition, drug treatment, health care, monitoring and nursing. According to the pain points of consumers, Jingdong Health has made key breakthroughs, fully realized door-to-door delivery services of large and small goods, and created a one-stop, comprehensive new experience of health care consumption [5].

3. Case Study

3.1. Theoretical Introduction -- UTAUT

In 2003, Venkatesh et al. integrated eight theories: rational behavior theory, technology acceptance model, motivation model, planned behavior theory, combined technology acceptance model, personal computer uses model, innovation diffusion theory, and social cognition theory. A deeper unified theory of acceptance and use of technology (UTAUT) is proposed [9]. The model measures users' willingness and behavior to use new technologies through four external potential variables (performance expectation, effort expectation, social influence, convenience) and two inhibitive factors (perceived risk and conversion cost). In this journal, it is applied to measure the willingness of the elderly to use the Internet medical platform. Existing studies have proved that in the relationship between the above factors and the intention to use the Internet medical platform, all 5 factors have an impact on the intention to use the Internet medical platform, except that the conversion cost cannot be proved to have an impact on the intention to use the Internet medical platform [10].

3.2. Theoretical Analysis of UTAUT

3.2.1 UTAUT Theoretical Analysis -- Promoting Effect

Performance expectation refers to the degree to which the elderly believe that Internet medicine can improve health management. The functions of the Internet medical platform are becoming more and more perfect, and using artificial intelligence, machine learning, VR, and AR technologies, intelligent auxiliary diagnosis, and intelligent diagnosis services are provided to users. At present, Internet medical treatment can check the status of patients' medication and eliminate medication errors, which bring convenience to patients. Moreover, Internet medicine can reduce medical costs, improve patient satisfaction, and improve medical efficiency and safety [11]. Jingdong Health and other Internet medical platforms have also built smart pharmacies, and smart hospitals, and launched their smart hardware brands and a series of smart wearable devices. The use of this smart product will greatly improve the willingness of elderly users. In addition, social influence also affects the willingness of older users to use. When society recognizes Internet medical treatment and its acceptance is improved, then the elderly receives a positive evaluation of the Internet medical platform, and their willingness to use it will be increased. Quantitative analysis shows that more than half of the elderly in Chinese cities are satisfied with digital medical services [12]. People's evaluation of Internet medicine will attract more elderly people and increase their willingness to use it. In addition, the examples of successful foreign medical platforms can also bring reference to Chinese elderly people. The Doctor on Demand platform, for example, has more than 700 doctors and has completed nearly 3M patient visits. Especially after COVID-19, telemedicine services have grown exponentially [13]. When the elderly sees the good social evaluation of such Internet medical platforms, they will increase their willingness to use the Internet medical platform. Convenience can also increase the willingness of older users. Convenience refers to the extent to which patients believe that external conditions such as the equipment they own support their use of the Internet medical platform [9]. The report, jointly released by the Renmin University of China and Alipay on Feb 8, said about 70 percent of the nearly 10,000 elderly respondents had taught themselves how to use mobile phones to access the Internet, and more than 70 percent of the respondents hoped training courses would allow them to learn relevant skills. And more than 60% said they were happier with their smartphones [14]. This shows that most elderly people accept the use of mobile phones, and the popularity of mobile phones is high. As the main platform equipped with Internet medical treatment, smartphones provide convenient conditions for the development of Internet medical platforms. In addition, China has always had strong support measures for Internet health care. In 1998, the remote consultation system was implemented in 20 hospitals in 15 cities in China [15]. In 2009, China launched a policy to develop telemedicine services to meet the needs of rural and remote community development [16]. The government has provided resources and support for the development of

Internet medical care, which is conducive to enhancing the elderly's willingness to use Internet medical platforms.

Therefore, the joint improvement of performance expectation, social influence, and convenience conditions will enhance the use intention of elderly users to some extent.

3.2.2 UTAUT Theoretical Analysis -- Existing Problems

Effort expectation means that patients need to rely on smart devices such as mobile phones for consultation through the Internet medical platform. A study on WeChat public accounts in the medical field shows that if the operation interface is clear and simple, users' enthusiasm will be enhanced [17]. At present, Jingdong Health pays less attention to the design of aging pages. For example, Jingdong Health launched the "health and happiness of the elderly" marketing campaign, there are pop-up ads on the page, and more options, which is not conducive to the operation of the elderly. The complexity of the operation method of Jingdong Health platform will reduce the willingness of the elderly to use it, thus reducing the number of elderly users. In addition, the increase in perceived risk will reduce the willingness of the elderly to use the Internet medical platform. According to the study, out of 59 Internet medical platform applications, only 12 require individual consent to process sensitive personal information. And only a quarter of apps require explicit consent from users to subcontract activities. Only a few applications involve the right to obtain a copy or the right to refuse an advertisement based on an automated decision [18]. At present, some Internet medical platforms have obvious defects in the informed consent part of personal information processing activities. The increase in perceived risk will harm the use intention of elderly users.

The rise in expectations and perceived risk will reduce the willingness of older people to use Internet medical platforms.

3.3. The Role of China's Aging Population in Promoting the Healthy Development of Jingdong

Based on the potential willingness of the elderly to use the Internet medical platform, Jingdong Health actively lays out the elderly care industry and launches a comprehensive service platform for elderly users. This measure not only promotes social progress but also helps to broaden customer groups and promote their development. In 2024, JD Health launched the Senior Care Channel, aiming to build an integrated platform that meets the various healthcare needs of China's aging population. The channel, aimed at aged services, offers a wide range of services that address key aspects of aged care. Services include health monitoring equipment, daily living and care, mobility and personal care AIDS, physiotherapy and traditional Chinese medicine treatments, smart technology products tailored for the elderly, nutritional supplements and foods, chronic disease medicines, and home visit care. This comprehensive approach reflects Jingdong Health's focus on seniors and commitment to meeting the multifaceted needs of the senior community. Jingdong Health also said that the number of people aged 60 and above in China has reached 280 million, with 90 percent of the elderly preferring home care. This represents a significant opportunity in the silver economy where JD Health can grow rapidly and be strategically positioned to lead and serve [19]. This proves that Jingdong Health has paid attention to the increasing willingness of the elderly to use the Internet medical platform, to set relevant elderly care services, which is in line with the trend of The Times and promotes its development.

3.4. Suggestions on the Healthy Development of Jingdong due to China's Aging Population

3.4.1 Develop the system for aging

When the use of the Internet medical platform is complicated, the effort expectation of the elderly will increase, and the willingness of the elderly to use it will be reduced. Therefore, the development of systems suitable for aging is a top priority. According to the analysis of the list of apps recommended for the elderly, their common feature is simple to use. Simply enter an elderly person's prescription and time in the Medisafe platform, and Medisafe creates a visual timeline with an image

of each pill and a list of potentially harmful interactions. In Google Maps, just click the current location to set it as the parking location and click the reserved location again when you travel again to navigate [20]. This kind of Internet platform prevents the elderly from carrying out a lot of operations, in line with the elderly's use habits. Jingdong Health can simplify the platform operation process and delete redundant advertisements popping up on the pension channel. The font is relatively enlarged and equipped with a 1-to-1 personalized service system to ensure the convenience of the elderly.

3.4.2 Improve the privacy protection system

When the Internet medical platform keeps the personal information of the elderly confidential, it can reduce the perceived risk of the elderly. Therefore, Jingdong Health should meet the legal requirements and build a strict privacy protection system. Anonymous medical consultation and multi-party encryption methods can be adopted to protect the privacy information of customers [21]. In addition, customer information should be obtained in the way of active inquiry and can be collected only when the customer explicitly agrees to collect information. Timely announcement of privacy protection measures on the official website to enhance the confidence of elderly users. Thus reduce the perceived risk of the elderly and achieve customer growth.

4. Conclusion

The deepening of China's aging population requires the development of Internet medical platforms. Internet medicine can save the time of the elderly, reduce the cost of medical treatment, and has good development prospects. According to the results of UTAUT, the elderly population in China has a potential willingness to use Internet medical platforms. Jingdong Health, as a rapidly developing Internet medical platform in China, has recognized the trend of increasing elderly people's willingness to use and timely distribute the elderly care industry to promote its development. However, due to the difficulty of use and the imperfect privacy protection system, some potential users are prevented from using the Internet medical platform. Jingdong Health needs to attract potential customers by developing measures to adapt its system to aging and improve its privacy protection system, to increase revenue. Therefore, the aging society provides development opportunities for the Internet medical platform, but it needs to break through the key obstacles reflected in the UTAUT model. In this way, it will provide well-being for the aging society and help the development of Jingdong Health and other Internet medical platforms.

However, this paper only analyzes the promotion and inhibition effects of China's aging population on Jingdong Health and does not specifically analyze the behaviors of other companies in the industry. If other studies analyze other companies and expand the scope to the entire Internet medical platform industry, they can be more representative. In the future, it is hoped that more Internet medical platforms can focus on protecting the aging population and promoting social development.

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