

Potential Consumers Attitudes on AI Doctor: Based on a Survey on College Students

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Abstract. AI doctors are expected to be of great significance to the progress of medical diagnosis and treatment. Reasonable use of artificial intelligence doctors can improve the efficiency of diagnosis and treatment. A market niche about AI doctor was discovered in this paper. In order to accurately understand the market prospect of artificial intelligence doctors, based on past literature research and combined with questionnaire data survey, the advantages, disadvantages, and development of artificial intelligence doctors are analyzed. As a result, the limitation will be the high price caused by high production cost, lack of information and the consumers' worries about the accuracy of AI doctor's diagnosis. However, the limitations may be settled by lowering the cost, appropriate popularizing and enhancing the working efficiency.

Keywords: AI; Doctor; Business plan; Consumer attitudes.

1. Introduction

Artificial intelligence technology (AI) is increasingly used in a series of clinical environments. AI can help clinicians complete tasks accurately and improve the speed of completion. At the same time, AI also has the possibility to surpass or even replace human intelligence. According to Shuaib and Arian (2020), the application of AI in health care is growing exponentially. These include physical applications (robotic surgery, robotic pharmacy) and visual applications (electronic medical record, outpatient appointment and health tracking). Clinical Decision Support System (CDSS) is one of the applications of AI in medical treatment. Stated by Moja et al. (2014), CDSS inputs patient data to generate each patient specific diagnosis and recommendations. CDSS can effectively help clinicians diagnose patients, construct suggestions on drugs and treatment plans and mark potential adverse reactions or allergic reactions of drugs. However, Wang et al. (2021) mentioned that, due to the lack of large-scale deployment of AI doctors, it is not particularly clear how clinicians will use these systems and how potential patients will experience using AI doctors.

Market research found that applying AI doctors has a potential business opportunity in China's medical industry. Suzhou Industrial Park has a large number of university students, which makes it being defined as the market niche. Thus, the paper is going to obtain more specific information from potential customers (college students) in this region. The main research questions of the paper are the impact of the attitudes of potential customers on the market prospect of AI doctors and potential customers' AI doctors' applying preferences. The answers to these questions can effectively help understand people's trust in AI doctors and the development trend of AI in the future medical industry.

2. Method

AI doctors need to understand and analyze AI technology, existing literature, and machine reliability to enter the business market. Therefore, this research aims to collect more specific data closely related to the research questions via an online questionnaire survey and takes college students in Suzhou Industrial Park as the survey object. A total of 45 college students completed the online questionnaire. The questionnaire consists of eleven questions. This includes demographic details, closed and open-ended questions. There are three Likert Scales, one Rank Order question and one Multiple choice question in this questionnaire. After using Excel to analyze the quantitative data and

thematic analyze the qualitative data, the results are obtained by comparing and correlating with the published essays and reports, some of which are mentioned in the literature review.

3. Results and Discussion

After analyzing the quantitative data related to the views of potential users, two market areas are obtained. One is the price, and the other is medical AI applying preferences. Overall, the demand and feedback given by the research object for applying AI technology to the medical industry are positive. The main finding is that when AI is widely used in the medical industry, it will reduce a great amount of manual waiting time for patients. Meanwhile, it can also solve the problems that some examinations cannot be done on the same day due to the hospitals' early closing time, and consolation for some diseases can only be postponed to the next day due to its specialty which leads to the inability to see a doctor in the emergency department.

3.1 Pricing

3.1.1 Overall result

The most concerned problem of students is related to price. The price of AI doctors has not been well studied and discussed in the existing literature. Price changes (increases) are usually inevitable in the market. Its changes are often related to supply and demand, competition, inflation, technology, trade negotiation and political policies. Some students responded that they were willing to pay higher registration fees in order to obtain faster service and 24-hour inquiry service. At present, the general outpatient registration fee of most hospitals in China is about 5 to 10rmb. The qualitative data in the survey shows that most participants believe that, while receiving AI intelligent services, the registration fee of 10 to 15rmb is an acceptable price range, as shown in table 1. While attaining the same service, it takes less time to obtain the results. In this way, the cost ceiling of 15rmb is reasonable. However, some other students showed reluctance to pay more than 10rmb of registration fee; "If I acquire the same diagnosis, there is no need to spend more money to wait a few minutes less". If the cost range of medical treatment is set at 5 to 10rmb, considering the high cost of the product, the minimization of the production cost of AI diagnostic doctors and the number of put into use and the region of putting into use will be carefully reconsidered. Moreover, as Ahmad et al. (2021) stated the production cost of AI doctors is very high and therefore the popularity of AI doctors will be affected by this .

Table 1. Preferred price for registration

5~15rmb	15~20rmb	20~25rmb	>25rmb
13	23	8	1

3.1.2 Difference between female and male

It is important to understand the preferencing price difference between genders. By comparing the quantitative data, it is clear that male participants are more willing to spend higher price on AI doctor. Although the general trends of the preference of two genders are similar, differences still exist. In general, most participants show their wishes to pay the price which is lower than 20rmb. As shown in table 2, only two female students are willing to spend the price higher than 20rmb. However, there are seven of the male students are willing to pay more than 20rmb.

Table 2. Difference on preferred price for registration between gender

Comparison	5~15rmb	15~20rmb	20~25rmb	>25rmb
Female	8	10	2	0
Male	5	13	6	1

3.1.3 Comparison of different ages

Other than the difference between genders, the differences between participants with different ages are also essential to the study. On the whole, as shown in table 3, the older the participants, the higher price they are willing to spend on registration. The only participant who is willing to spend more than 25rmb for the registration is over 20 years old, and he/she replied that in his/her perspective, it is worthy to spend higher money for the higher technological method for diagnosis and treatments.

Table 3. Difference on preferred price for registration between different ages

Comparison	5~15rmb	15~20rmb	20~25rmb	>25rmb
<15 years	4	5	1	0
15 ~ 20 years	4	8	3	0
>20 years	5	10	4	1

3.2 AI Doctor preferences

3.2.1 Overall results

Both qualitative and quantitative data pointed out participants' interests and concerns about the reliability, cost, time savings of AI technology, and whether 24-hour diagnostic services can be provided. The students strongly agree to use AI diagnostic doctors, as with the non-stop work of AI diagnostic doctors, some tests that cannot be done manually at night do not have to be delayed until the next day. Moreover, when AI registration is popular, students do not have to drag their sick bodies to line up at the window for registration. A student expressed his great hope that the hospital would provide AI doctors with night examination services. Such examinations as MRI can be carried out at night. Similar views were also mentioned by a group of participants. All participants expressed their desire for a quick way to obtain a diagnosis, so that they can save a great amount of time and do not delay the examination. 80% of the students mentioned they could accept the use of AI for registration, taking medicine and attaining diagnosis. However, only 20% of the students responded that they could accept AI robots to operate on themselves, as shown in figure 1. The results seem reasonable, as Ahmad et al. (2021) stated that the application of AI in clinical medicine is still in its infancy, and its accuracy needs to be improved. The survey results show that the application of AI in various medical fields has been supported by potential student patients. As seen in figure 2, health tracking received the most support, while robot surgery had the least support.

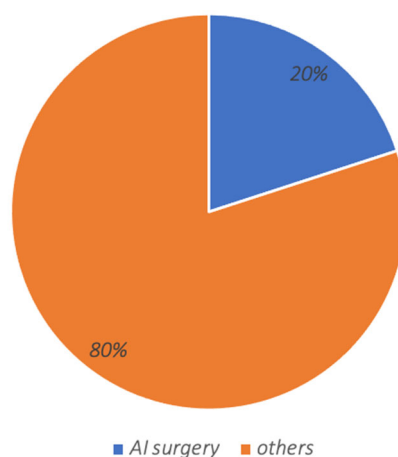


Figure 1. Preference of AI Application

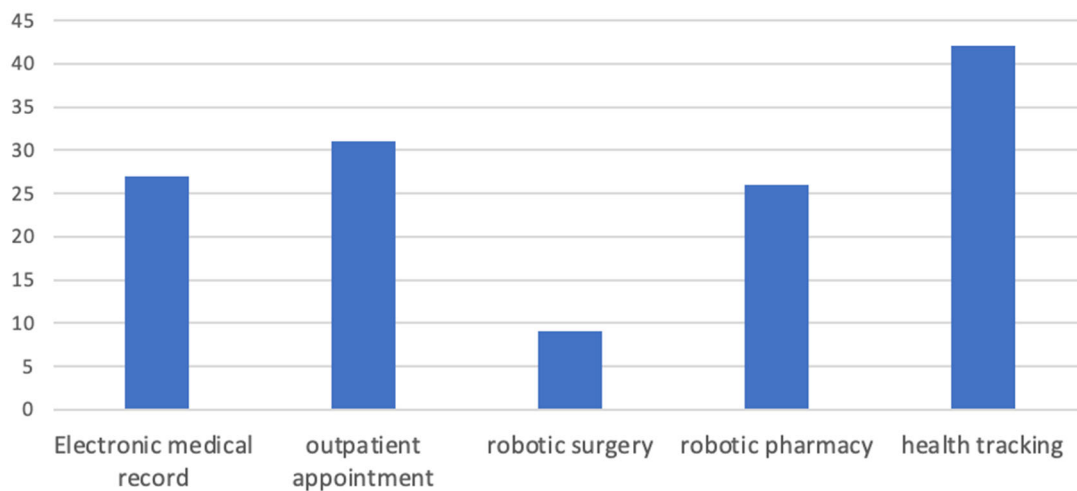


Figure 2. AI Application Preference

3.2.2 Difference between female and male

According to the survey, people of different genders provide different preference feedback. As shown in figure 3, it is obvious that there is greater number of male participants than female participants who are willing to accept AI doctor. There are 16 male participants who are willing to accept AI doctor for the diagnosis and treatments, however, there are only 6 female participants who responded the same choice. A total of 70% of female participants show their reluctant attitudes to AI doctor, but there are 72% of male participants give the opposite opinion. Some female participants responded that due to the lack of knowledge of how AI works, they feel mistrust about the accuracy and professionalism of AI doctor. On the other hand, male participants have much less concern on this aspect .

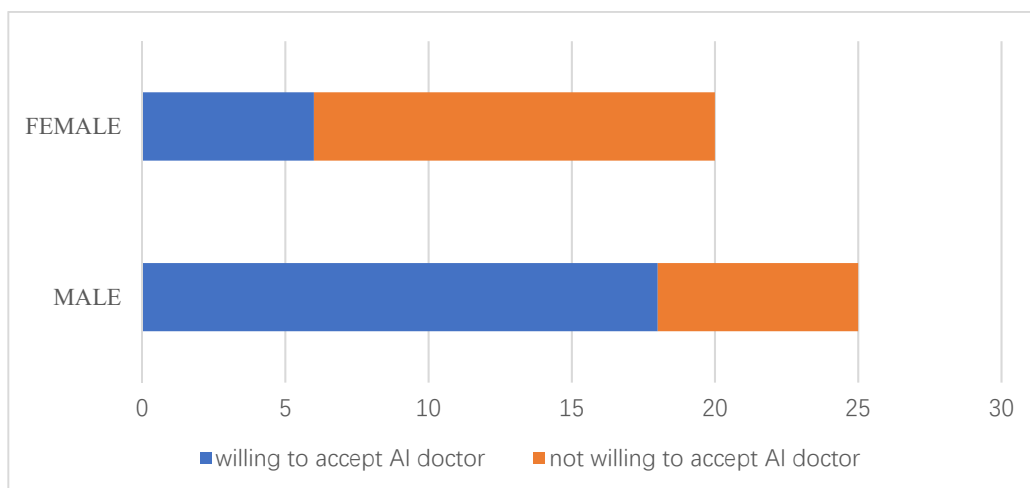


Figure 3. Preference Difference Between two genders

3.2.3 Comparison of different ages

Other than difference of preferences between female and male, distinction also exists with different ages. Preferences among different ages do not have a very significant difference. Basically, the three age groups have no significant tendency to accept AI doctors. However, compared with the younger age group, there will be relatively more people who are willing to accept the treatment of AI doctors in the older age group.

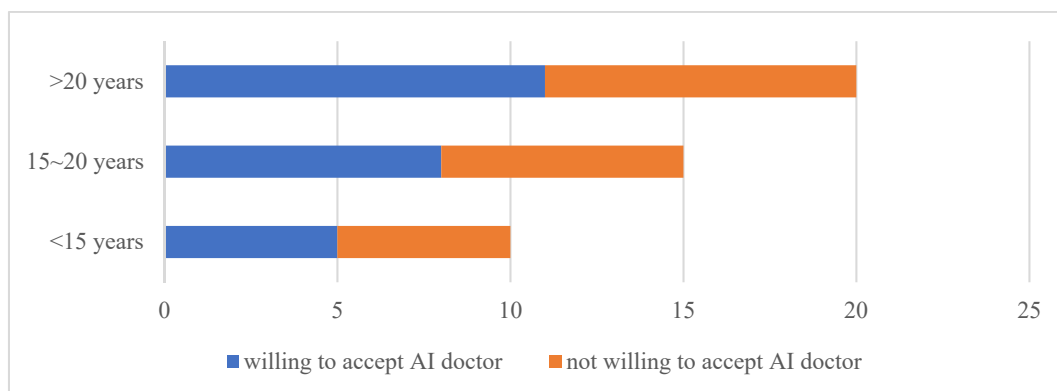


Figure 4. Preference Comparison of different ages

4. Conclusions

To sum up, this paper investigates the attitude of potential users towards AI doctors in the form of online questionnaire to study whether it could be a business opportunity. From what has discussed above, it may be safely to draw a conclusion that the respondents' attitudes towards AI doctors are positive, and the main focus should be on the development of robot pharmacy and 24-hour examination service in the medical industry [10]. In addition, price is also the key to affecting most consumer demand and product positioning. Since most participants said that the price acceptance range for outpatient appointment is less than 15rmb, the popularity of AI doctors will be greatly limited due to the high cost of the product. Due to the single sample type of the survey, the research results have certain limitations. Interviewing people of different ages and occupations in different regions may receive different results. Future research needs to study the production and cost of products. However, by lowering the cost of production of the AI doctor, it is possible to improve the popularity of AI doctor [11]. In addition, by appropriate advertising and popularizing knowledge about AI, the acceptance of AI doctor might become optimistic. Moreover, as long as the product can provide reasonable price and high accuracy, it will have a substantial prospect in the medical device market.

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