

PAPER

Investigation and Analysis of Private Doctors Helping the Elderly Care Market

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The proportion of China's aging population is high, and the health care system has become a hot topic. This study considers the private doctor service-assisted health care market and investigates doctors, middle-aged and young people, and the elderly, respectively. Through correlation analysis, the relationship between respondents' willingness to accept private doctors and various factors was obtained. Then the logistic regression model was used to obtain the linear relationship between these related variables and the sign-up intention (willingness to participate) of different groups.

KEYWORDS

private doctor service, correlation analysis, logistic regression model

1 INTRODUCTION

At the fifth session of the 13th National People's Congress in 2022, Zhang Jiawen, NPC Deputy and Deputy Secretary-General of the Standing Committee of the Daqing Municipal People's Congress, posted a series of figures: "There are 264.02 million people aged 60 and above in China, accounting for 18.70 percent." According to international standards, if the proportion of population over 60 years old in the total population of a country or region exceeds 10%, it means that it has entered a mild aging society; more than 20% is a moderate aging society, more than 30% is a severe aging society, and more than 35% is a deep aging society. With the continuous development of the economy and the acceleration of urbanization, the aging population in China is facing more severe challenges [1]. The 18th CPC National Congress and the Third Plenary session of the 18th CPC Central Committee made it clear that we should actively respond to the aging of the population and vigorously develop services and industries for the elderly. Accelerating the development of the aging service industry is a strategic need to actively respond to population aging. The rapidly

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developing aging population in China is accompanied by an increasingly obvious trend of aging, disability, miniaturization of family structure, and empty-nesting. The elderly have an increasingly high demand for services in life care, medical and health care, rehabilitation nursing, and other services, and it is urgent to accelerate the development of an elderly-services network. The Healthy China strategy has been upgraded to a national strategy, which has been transformed from a focus on diagnosis and treatment to a focus on people's health [2]. With the process of aging, the problem of old-age care is becoming increasingly severe, and the demand for old-age care services presents new challenges [3]. All this calls for better and more comprehensive medical services, and private doctors have come into being. Therefore, a team approach is becoming the direction for promoting the health needs of the elderly, to help the market of private doctors in health care, and to perfect the medical service system of health care in our country. This study is based on the three groups in the form of a questionnaire investigation and a correlation study on the collected data to reflect the differences among these groups in attitude toward private doctor service, research on elderly health care service system in our country, and the development of the private doctor service industry to deal with an aging population, which all have practical significance.

2 RESEARCH STATUS

The combination of medical care and elderly care is a characteristic elderly care service model that integrates medical and health care services. Its core is the combination of medical care and care. The management projects include medical care, rehabilitation, physical examination, hospice care, and other professional medical services based on traditional life care services. In 2013, the Chinese government first proposed to develop the mode of combining medical care and nursing care. In the "Several Opinions of The State Council on Accelerating the Development of Nursing Service Industry," the government actively promoted the combination of medical and other health care services, and promoted the access of medical and health resources to nursing home communities and families. The goal was to support the establishment of medical institutions by old-age care institutions with conditions by exploring a new mode of cooperation between medical institutions and old-age care institutions. In recent years, a series of relevant policies has been introduced to promote the development of the combination of medical and old-age care, and specific goals, services, and supporting measures have been formulated, which play a guiding role in the development of the combination of medical and old-age care. Through the study of long-term hospitalization, Fu Meiling et al. believe that the establishment of a care system of a "combination of medical care and nursing care" in China is a new model to optimize the quality of medical care and old-age care services and is an effective way to deal with aging and aging population [4].

The present medical care service operates by three main modes: medical institutions to carry out the health care services, health care organizations to establish medical services, and medical institutions and health care agencies acting in cooperation. Liu Hao et al. analyzed the cross-section data of CLHLS in 2018 and found that the elderly in China are predominantly cared for by their families, with a large proportion of the elderly living alone, while the proportion of the elderly participating in institutional care is very low [5]. Due to the insufficient supply of old-age care institutions and the influence of traditional old-age care ideas and limited economic basis, the elderly still prefer traditional home-based old-age care and are not willing

to go to nursing homes and other relevant institutions for old-age care. By analyzing the current situation and needs of the elderly, Bu Deqing et al. found that the needs of the elderly for home-based care services are mainly divided into physical health needs and spiritual enrichment needs [6]. Research on home care service in our country is still in the stage of exploration. The National Health Commission and nine other departments jointly issued the Notice on the Action to Improve the Capacity of Integrating medical and nursing care in communities, calling for further increasing the supply of integrated medical and nursing care services at home and improving the quality and level of services. The focus is to provide health education, preventive health care, disease diagnosis and treatment, rehabilitation nursing, hospice care for the disabled and those with chronic disease, and combined medical and nursing services for the elderly and disabled. Some areas have created community health service centers based on the adoption of a family doctor contract or family bed service model. But family doctors work in community health centers or township health centers, not at home. So this kind of medical service is very different from what we call private physician service. As the country's economy gets better and the middle class grows, so does the demand for high-quality medical care. With the growing demand for a strong health care service, China's health care industry is in a stage of rapid development, and the "private doctor" escort health care mode is ready to emerge.

3 RELIABILITY AND VALIDITY TEST OF QUESTIONNAIRE

Reliability and validity are a test method for the quality of a questionnaire in which reliability is the premise and basis of validity, and validity is the purpose and result of reliability. A measurement that achieves the dialectical unity of the two will be scientific. If the reliability and validity of the questionnaire are excellent, the reliability of the questionnaire data is high and the internal consistency of the questionnaire data is high. Therefore, in order to test the quality of the questionnaire, the reliability and validity of the questionnaire were tested.

3.1 Reliability test

A reliability test is used to measure the reliability of the sample answers, i.e., whether the sample truly answers the scale questions. The Cronbach's α coefficient method was used to test this survey. The higher the α coefficient, the better the internal consistency of the questionnaire. It is generally believed that the questionnaire has certain use value if the α coefficient is above 0.7. Since the questions in the questionnaire were set with skipping questions, the blank value was marked as 0 to distinguish it from other options. The test results of the three questionnaires are as follows:

Table 1. Reliability statistics

Questionnaire Categories	Reliability Statistics	
	Cronbach's α	Cronbach's α Based on Standardized Items
Doctors	0.701	0.877
Middle-aged and young people	0.762	0.781
Senior citizens	0.865	0.914

As can be seen from the above Table 1, the Cronbach coefficients of the three questionnaires are all greater than 0.7, so the questionnaires can be considered credible, that is, with consistent, stable, and reliable the results.

3.2 Validity test

A validity test is used to test the validity of a questionnaire. Generally speaking, it is used to determine whether the designed test is reasonable. The higher the validity, the more the test results are likely to represent the real characteristics of the measured object. The validity of this questionnaire was tested by structural validity test, namely the KMO test and the Bartlett test of sphericity. According to Kaiser's commonly used metrics, $KMO > 0.9$ is the best, $KMO > 0.8$ is good, $KMO > 0.7$ is medium, $KMO > 0.6$ is poor, and $KMO > 0.5$ is the lowest. However, Bartlett's test of sphericity requires that the test results pass the significance level for the questionnaire to be regarded as valid from the perspective of questionnaire structure validity.

Table 2. Validity test

KMO and Bartlett Test				
		Doctors	Middle-Aged and Young People	Senior Citizens
Kaiser-Meyer-Olkin measure of sampling adequacy		0.849	0.837	0.947
Bartlett's test of sphericity	Approx. chi-square	3608.021	6625.549	11652.845
	Df	236	253	630
	Significance	0.00	0.00	0.00

As can be seen from Table 2, the KMO values of the three questionnaires are all greater than 0.8, with the questionnaire for the elderly reaching 0.947, and the P value of <0.05 indicates that the questionnaire has good structural validity.

4 DESCRIPTIVES STATISTICS

During the survey, the respondents were strictly controlled. According to the combination of offline and online methods, 351 questionnaires were collected for doctors, 434 questionnaires for middle-aged and young people, and 345 questionnaires for the elderly, among which 311 were valid for doctors, 387 were valid for middle-aged and young people, and 310 were valid for the elderly. A total of 1130 questionnaires were collected, and the number of valid questionnaires was 1008. The effective recovery rates of the three questionnaires were 88.61%, 89.17%, and 89.86%, respectively.

4.1 Gender distribution of respondents

To understand the gender distribution of respondents, a pie chart was made (Figure 1).

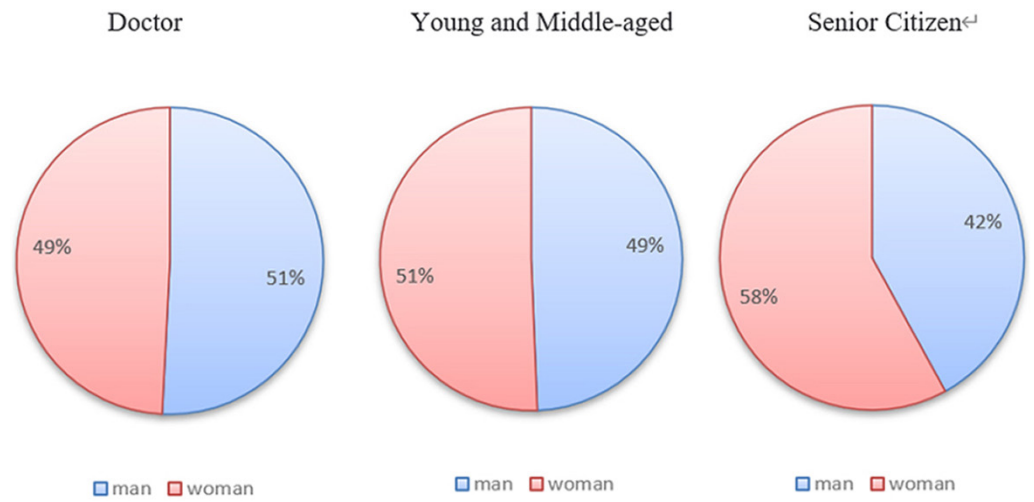


Fig. 1. Gender distribution of respondents

Among the doctors interviewed in this survey, men and women accounted for 51% and 49% of the total number, respectively; among the middle-aged and young interviewees, men and women accounted for 49% and 51%, respectively; among the elderly interviewees, men account for 42% and women account for 58%, indicating a balanced gender distribution. Therefore, the distribution of the questionnaire has a certain randomness.

4.2 Attitudes towards personal doctors among respondents

In order to understand the attitudes of the respondents towards private doctor services, a pie chart below was made (Figure 2).

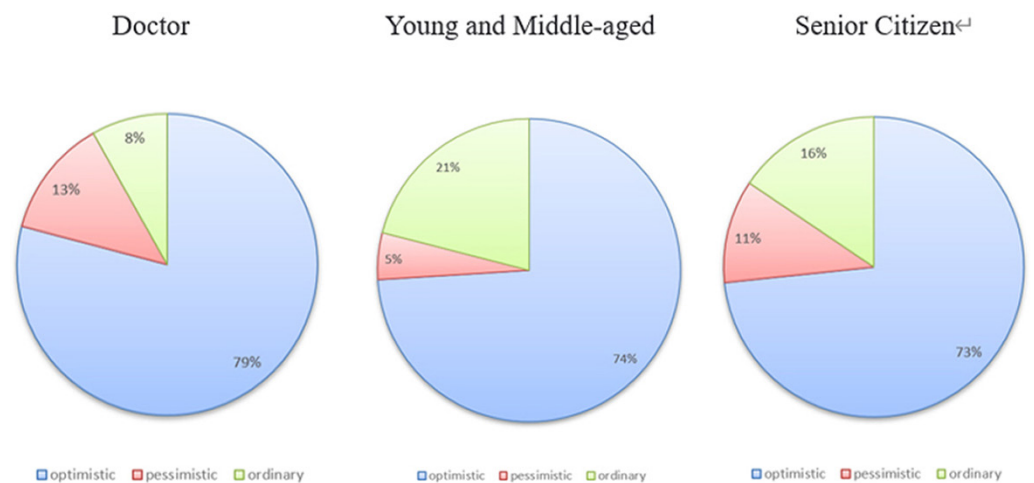


Fig. 2. Respondents' attitudes towards private doctors

Demand is the driving force of development. From Figure 2, it can be clearly seen that the vast majority of respondents in their respective groups—whether doctors, middle-aged and young people, or old people—are optimistic about the future development trend of private doctor services in China, while only a few of them hold a negative attitude, which indicates that private doctors have potential for development in China.

5 CORRELATION ANALYSIS

Correlation analysis refers to the analysis of two or more variable elements with correlation, so as to measure the correlation degree of two variable factors. In correlation analysis, the Pearson correlation coefficient is used to measure the correlation between two variables X and Y, and its value is between -1 and 1 . Although the correlation coefficient can distinguish the correlation of data, it still needs to be determined by combining the test probability and the actual situation. When the test probability is less than 0.05 , it means that there is a correlation between the two columns of data. In our country, the retirement age is divided into two specific standards: male retirement age is generally 60 years old; female retirement age is 55 or 50 years old. This survey is based on classifying *elderly* according to the retirement ages of ≥ 60 years old for men and ≥ 55 years old for women. In order to understand the relevant variables affecting the willingness of different groups to accept private doctors, this study made a correlation analysis for different groups.

5.1 Doctor correlation analysis

In order to verify whether the willingness of doctors to sign a contract with private doctors is related to gender, age, professional title, salary, and other factors of doctors, a correlation analysis was made, and the detailed analysis is shown in Table 3.

Table 3. Correlation analysis of doctors

		Sex	Age	Knowledge	Sign-up Intention
Sex	Pearson	1	-.138*	.236**	-0.064
	Significance		0.045	0.001	0.350
Age	Pearson	-.138*	1	-0.113	-0.079
	Significance	0.045		0.100	0.249
Rank	Pearson	0.093	-.498**	0.040	.318**
	Significance	0.175	0.000	0.560	0.000
Salary	Pearson	-0.123	.439**	-0.011	-0.077
	Significance	0.073	0.000	0.877	0.264
Years of working	Pearson	-0.057	.574**	0.050	-.140*
	Significance	0.411	0.000	0.466	0.041
Hospital category	Pearson	0.014	0.053	0.086	0.028
	Significance	0.835	0.444	0.209	0.688
Medical model	Pearson	-0.027	-0.065	.247**	-0.090
	Significance	0.699	0.346	0.000	0.193
Medical care	Pearson	0.109	-0.119	.189**	0.012
	Significance	0.114	0.083	0.006	0.866
Knowledge	Pearson	.236**	-0.113	1	-.264**
	Significance.	0.001	0.100		0.000
Sign-up intention	Pearson	-0.064	-0.079	-.264**	1
		0.350	0.249	0.000	

Notes: ** $P < 0.01$. *** $P < 0.001$.

As can be seen from the table's correlation analysis, among all the variables, only Rank, Years of working, and Knowledge have P values less than 0.05, while the other variables have P values greater than 0.05. This shows that the factors that have a significant impact on the willingness of doctors to sign up for the service of private doctors are the professional title of doctors themselves, the years of medical experience, and the degree of understanding the role of private doctors. However, the remaining variables had no significant effect on doctors' willingness to sign contracts, so the study was not carried out. As for coefficients, the coefficient of the professional title factor was greater than 0, indicating a positive correlation, while the coefficient of length of medical experience and degree of understanding of private doctors were less than 0, indicating a negative correlation. Therefore, further analysis should be conducted on the factors with significant influence.

5.2 Correlation analysis of middle-aged and young people

In order to verify whether the willingness of middle-aged and young people to hire private doctors for the elderly is related to their sex, age, occupation, and other factors, a correlation analysis was made, and the detailed analysis process is shown in Table 4.

Table 4. Correlation analysis of middle-aged and young people group

		Sex	Age 1	Whether the Relief	Sign-up Intention
Sex	Pearson	1	-.980**	-0.121	-0.109
	Significance		0.000	0.072	0.105
Age 1	Pearson	-.980**	1	.153*	0.115
	Significance	0.000		0.022	0.088
Age 2	Pearson	.972**	-.953**	-0.079	-0.080
	Significance	0.000	0.000	0.242	0.233
Profession	Pearson	-0.029	0.056	-0.054	0.087
	Significance	0.667	0.409	0.425	0.196
Income	Pearson	-0.051	0.044	-.279**	-0.071
	Significance	0.451	0.519	0.000	0.292
Old-man number	Pearson	-0.020	0.000	-0.066	0.007
	Significance	0.765	0.998	0.326	0.922
Support spending	Pearson	-0.034	0.002	-0.101	-0.044
	Significance	0.612	0.975	0.135	0.519
Elderly people living alone	Pearson	0.030	-0.026	.174**	.256**
	Significance	0.660	0.698	0.009	0.000
Care for health	Pearson	-0.031	0.012	-.238**	-0.098
	Significance	0.641	0.856	0.000	0.146

(Continued)

Table 4. Correlation analysis of middle-aged and young people group (Continued)

		Sex	Age 1	Whether the Relief	Sign-up Intention
Knowledge	Pearson	.216**	-.234**	-.255**	-.378**
	Significance	0.001	0.000	0.000	0.000
Whether the Relief	Pearson	-0.121	.153*	1	.229**
	Significance	0.072	0.022		0.001
Sign-up intention	Pearson	-0.109	0.115	.229**	1
	Significance	0.105	0.088	0.001	

Notes: * $P < 0.05$. ** $P < 0.01$. *** $P < 0.001$.

As can be seen from Table 4, the only variable with significance < 0.05 were Elderly People Living Alone, Knowledge, and Whether the Relief, the last variable meaning whether or not the elderly experience relief from living together. The level of understanding of private doctors and the implementation and application of a smart-health big-data platform in the future could reduce the pressure of supporting the elderly. It would have a significant impact on the willingness of young and middle-aged people to hire private doctors for the elderly. The significance values of the other variables are all greater than 0.05, so these variables have no significant impact on middle-aged and young people hiring private doctors for the elderly. These three variables still need further study.

5.3 Correlation analysis of the elderly

In order to verify whether the elderly's willingness to use the private doctor service platform is related to their gender, age or other factors, the following correlation analysis is made, as shown in Table 5.

Table 5. Correlation analysis of the elderly population

		Sex	Age 1	Relational Schema	Sign-up Intention
Sex	Pearson	1	-.976**	-0.003	0.088
	Significance		0	0.96	0.197
Age 1	Pearson	-.976**	1	0.028	-0.091
	Significance	0		0.685	0.184
Age 2	Pearson	.965**	-.942**	0.013	0.072
	Significance	0	0	0.845	0.295
Whether living alone	Pearson	.176**	-.213**	-0.037	-0.099
	Significance	0.01	0.002	0.587	0.149
Care for health	Pearson	-.140*	0.126	-0.01	.340**
	Significance	0.04	0.067	0.888	0.124
Health	Pearson	-0.131	.163*	0.021	-.141*
	Significance	0.055	0.017	0.763	0.04

(Continued)

Table 5. Correlation analysis of the elderly population (*Continued*)

		Sex	Age 1	Relational Schema	Sign-up Intention
Living cost	Pearson	0.085	-0.119	-0.034	0.063
	Significance	0.215	0.082	0.623	0.356
Periodic physical examination	Pearson	0.08	-0.1	0.008	-.295**
	Significance	0.244	0.145	0.91	0
Medical system	Pearson	-0.008	-0.038	-0.077	.268**
	Significance	0.912	0.58	0.262	0
Electronics	Pearson	.178**	-.208**	-0.078	0.083
	Significance	0.009	0.002	0.257	0.224
Knowledge	Pearson	-0.059	0.008	-0.069	.149*
	Significance	0.391	0.912	0.313	0.03
Relational schema	Pearson	-0.003	0.028	1	0.089
	Significance	0.96	0.685		0.194
Sign-up intention	Pearson	0.088	-0.091	0.089	1
	Significance	0.197	0.184	0.194	

Notes: * $P < 0.05$. ** $P < 0.01$.

As can be seen from Table 5, variables with significance < 0.05 are Health, Periodic Physical Examination, Medical System, and Knowledge, which indicates the willingness of the elderly to use the private doctor service platform based on their own health status and whether they go to the hospital for examinations regularly. There is a significant correlation between satisfaction with the current medical model and knowledge of private doctors. Significance values of other variables are all greater than 0.05, indicating that these variables have no significant impact on the willingness of the elderly to use the private doctor service platform, so it is not studied. Among these significant variables, the coefficient of medical system and the degree of understanding is positive when the coefficient is greater than 0, while the coefficient of health status and regular examination is negative when the coefficient is less than 0. Therefore, it is necessary to further analyze and explore the relationships between them.

6 LOGISTIC REGRESSION ANALYSIS

When the logistic regression model can fit the data well, the coefficients of the model can be explained, similar to the linear regression coefficients. The logistic regression coefficient can also be interpreted as the change in the dependent variable caused by a one-unit change in the corresponding independent variable.

Correlation analysis is the basis of and premise for regression analysis, and regression analysis is a deeper continuation of correlation analysis. The two have common objects of study and often must complement each other in application. Correlation analysis needs to rely on regression analysis to show the specific form of the phenomenon quantity correlation, while regression analysis needs to rely on correlation analysis to show the correlation degree of the phenomenon quantity change.

Only when there is a high correlation between variables is it meaningful to conduct regression analysis to find out the specific form of correlation. Through the above correlation analysis, it is concluded that the significant factors affecting the willingness of different groups to accept private doctors are different. In order to further explore the relationship between them, this study used the method of logistic multiple regression analysis.

6.1 Logistic regression analysis of doctors

In order to reflect the relationship between professional title, years of medical experience, degree of understanding, and doctors' willingness to contract with private doctors, we established a logistic regression model, where, X_1 represents Years of working, X_2 represents Hospital category, and X_3 represents Knowledge (Table 6).

Table 6. Variable meanings described

Variable Label	Variable Meaning	Assignment
X_1	Years of working	1=0–1 year, 2=2–3 years, 3=4–5 years, 5≥5 years
X_2	Hospital category	1=Public hospital, 2=Private hospital 3=Community hospital
X_3	Knowledge	1= Not very understanding 2=Not understanding 3=Ordinary 4=Understanding 5=Very understanding
Y	Sign-up intention	0=Yes; 1=No

To judge how well the model fit, we performed the analysis shown in Table 7.

Table 7. Model-fitting information

Model	Model-Fitting Criteria –2 Log Likelihood	Likelihood Ratio Tests		
		Chi-Square	df	Significance
Intercept only	225.225			
Final	175.925	49.300	18	0.000

According to Table 7, the significance of fitting the model is <0.05, indicating that there is a good fitting situation. The final fitting results are shown in Table 8.

Table 8. Fitting of coefficients

	B	Std. Error	Wald	Df	Significance	Exp(B)
Intercept	0.634	0.709	0.800	1	0.371	
[Years of working=1]	2.448	1.128	4.711	1	0.030	11.567
[Years of working=2]	0.025	0.520	0.002	1	0.962	1.025
[Years of working=3]	–0.490	0.581	0.710	1	0.400	0.613
[Years of working=4]	0 ^b			0		
[Hospital category=1]	–0.337	0.560	0.361	1	0.548	0.714
[Hospital category=2]	–0.797	0.562	2.011	1	0.156	0.451

(Continued)

Table 8. Fitting of coefficients (Continued)

	B	Std. Error	Wald	Df	Significance	Exp(B)
[Hospital category=3]	0 ^b			0		
[Knowledge=1]	1.757	1.157	2.305	1	0.129	5.795
[Knowledge=2]	0.957	0.774	1.528	1	0.216	2.605
[Knowledge=3]	0.799	0.528	2.289	1	0.130	2.223
[Knowledge=4]	-0.528	0.505	1.094	1	0.296	0.590
[Knowledge=5]	0 ^b			0		

The final regression equation fitted from Table 8 is:

$$\begin{aligned}
 \text{Logit}(P) = & 0.634 + 2.448X_1(1) + 0.025X_1(2) - 0.490X_1(3) \\
 & - 0.337X_2(1) - 0.797X_2(2) + 1.757X_3(1) \\
 & + 0.957X_3(2) + 0.799X_3(3) - 0.528X_3(4)
 \end{aligned}$$

Through the above analysis, it can be found that the influence of years of medical service on the willingness of doctors to sign up for private doctor services: doctors with few years of medical service are more willing to sign up for private doctor services, and the probability of being willing to sign up for private doctor services decreases with the increase of years of medical service. From the perspective of their hospitals, doctors in public hospitals and private hospitals are not willing to sign up for private doctor services, while doctors in community hospitals are more interested in signing up for private doctor services. Also, through surveying the degree of understanding of private doctors, it can be seen that the respondents who know more about becoming private doctors do not show the willingness to sign up as private doctors.

6.2 Logistic regression analysis of middle-aged and young adults

To reflect the relationships among Elderly people living alone, Knowledge, and Whether the relief and the willingness of middle-aged and young people to hire private doctors, we established a Logistic regression model. Among them, X_1 means Elderly people living alone, X_2 means Knowledge, and X_3 means Whether the relief (Table 9).

Table 9. Description of variables

Variable Label	Variable Meaning	Assignment
X_1	Elderly people living alone	1=Yes; 2=No
X_2	Knowledge	1= Not Very Understanding 2=Not Understand 3=Ordinary 4=Understand 5=Very Understanding
X_3	Whether the relief	1=Able; 2=Uncertainty; 3=Unable
Y	Sign-up intention	1=Yes; 2=No

To judge the fitting effect of the model, we analyzed how well the model fit the information (Table 10).

Table 10. Model-fitting information

Model	Model-Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood	Chi-Square	Df	Significance
Intercept only	202.530			
Final	111.890	90.640	90.640	0.000

According to Table 10, the fitting significance of the model is <0.05, indicating that there is a good fitting situation. The final fitting results are shown in Table 11.

Table 11. Fitting of coefficients

	B	Std. Error	Wald	Df	Significance	Exp(B)
Intercept	-2.815	1.292	4.750	1	0.029	
[Elderly people living alone=1]	-0.989	0.481	4.230	1	0.040	0.372
[Elderly people living alone=2]	0 ^b			0		
[Knowledge=1]	5.332	1.338	15.875	1	0.000	206.878
[Knowledge=2]	5.710	1.323	18.631	1	0.000	301.822
[Knowledge=3]	2.147	0.867	6.135	1	0.013	8.559
[Knowledge=4]	2.251	0.871	6.675	1	0.010	9.494
[Knowledge=5]	0 ^b			0		
[Whether the relief=1]	1.648	1.063	2.405	1	0.121	5.196
[Whether the relief=2]	2.077	1.059	3.847	1	0.050	7.983
[Whether the relief=3]	0 ^b			0		

The final equation obtained is:

$$\begin{aligned} \text{Logit}(P) = & -2.815 - 0.989X_1(1) + 5.332X_2(1) \\ & + 5.710X_2(2) + 2.147X_2(3) + 2.251X_2(4) \\ & + 1.648X_3(1) + 2.077X_3(2) \end{aligned}$$

According to the above analysis, middle-aged and young people are less willing to hire a private doctor if they live with an elderly person. At the same time, middle-aged and young people have a strong understanding of private doctors in terms of signing up for private doctor services. Compared with those who know more about private doctors, those who know less about private doctors are more willing to sign up for private doctor services. One of the reasons for this is that most respondents do not know about private doctors, but there is a demand for them. In terms of whether the pressure of supporting the elderly can be alleviated, the coefficients are all greater than 0, indicating that the willingness of middle-aged and young people to hire private doctors for the elderly is also greatly affected.

6.3 Logistic regression analysis of the elderly population

To reflect the relationship between Health, Periodic physical examination, Medical system, and Knowledge, and the willingness of the elderly to accept private

doctors, a logistic regression model was established, where X_1 represents Health, X_2 represents Periodic physical examination, X_3 represents Medical system, and X_4 represents Knowledge. Multiple logistics regression analysis is used for mining, and relevant variables are quantified according to needs. The detailed analysis process is shown in Table 12.

Table 12. Description of variables

Variable Label	Variable Meaning	Assignment
X_1	Health	1=Healthy; 2=Somewhat unhealthy; 3=Sick
X_2	Periodic physical examination	1=Yes; 2=No
X_3	Medical system	1=Very dissatisfied; 2=Dissatisfied 3=Neither dissatisfied nor satisfied; 4=Satisfied; 5=Very satisfied
X_4	Knowledge	1= Not Very Understanding 2=Not Understand 3=Ordinary 4= Understand 5=Very Understanding
Y	Sign-up intention	0=Yes; 1=No

To judge the fitting effect of the model, we analyzed model-fitting information (Table 13).

Table 13. Model-fitting information

Model	Model-Fitting Criteria -2 log Likelihood	Likelihood Ratio Tests		
		Chi-Square	Df	Significance
Intercept Only	365.297			
Final	254.598	110.699	44	0.000

According to Table 13, the fitting significance of the model is <0.05 , indicating that there is a good fitting situation. The final fitting results are shown in Table 14.

Table 14. Parameter estimates

	B	Std. Error	Wald	Df	Significance	Exp(B)
Intercept	-26.77	14.949	3.207	1	0.073	
[Health= 1]	19.069	1.883	102.521	1	0.000	191286355.452
[Health= 2]	21.712	0.000		1		2686691064.114
[Health=3]	0 ^b			0		
[Periodic Physical Examination=1]	3.615	3.325	1.182	1	0.277	37.165
[Periodic Physical Examination=2]	0 ^b			0		
[Medical System=1]	2.251	8.032	0.079	1	0.779	9.502
[Medical System=2]	5.123	8.608	0.354	1	0.552	167.766
[Medical System=3]	3.062	7.974	0.147	1	0.701	21.370
[Medical System=4]	5.445	8.406	0.420	1	0.517	231.658
[Medical System=5]	0 ^b			0		

(Continued)

Table 14. Parameter estimates (Continued)

	B	Std. Error	Wald	Df	Significance	Exp(B)
[Knowledge=1]	4.119	12.926	0.102	1	0.750	61.526
[Knowledge=2]	4.910	12.921	0.144	1	0.704	135.707
[Knowledge=3]	7.552	13.831	0.298	1	0.585	1904.359
[Knowledge=4]	1.288	13.032	0.010	1	0.921	3.625
[Knowledge=5]	0 ^b			0		

The final equation obtained is:

$$\begin{aligned} \text{Logit}(P) = & -26.77 + 19.069X_1(1) + 21.712X_1(2) \\ & + 3.615X_2(1) + 2.2251X_3(1) + 5.123X_3(2) \\ & + 3.062X_3(1) + 5.445X_3(4) + 4.119X_4(1) \\ & + 4.910X_4(2) + 7.552X_4(3) + 1.288X_4(4) \end{aligned}$$

From the above analysis, it can be seen that the regression coefficients in the variables are all positive and relatively large, especially in the variable of Health status. The regression coefficient value reaches about 20, so it can reflect that the elderly have a stronger willingness to hire private doctors.

7 CONCLUSIONS AND SUGGESTIONS

7.1 Conclusion

Through the above data analysis, it is concluded that the significant factors affecting the willingness to accept private doctors in different groups are different. The significant variables in the group of doctors are the type of hospital, years of medical service, and degree of understanding of private doctors. With the increase of years of medical service, the probability of being willing to sign a contract with private doctors decreases. Doctors in community hospitals are more interested in signing up for private services. The more knowledgeable the respondents were about their private doctors, the less willing they were to sign up for their services. The significant variables in the children group are whether they live with the elderly, how much they know about private doctors, and whether they can relieve the pressure of supporting the elderly. If the children live with the elderly, they are less willing to hire private doctors. Those who know less are more willing to sign up for private services. The willingness of children of the elderly to hire private doctors for a parent is also greatly influenced by the ability to reduce the pressure of supporting the elderly. The significant variables in the elderly group are their own health status, whether they regularly go to the hospital for physical examination, their satisfaction with the current medical system, and their understanding of private doctors. All these variables indicate that the elderly are more willing to hire private doctors.

7.2 Recommendation

In view of the low recognition of private doctors' services among the elderly, the development of private doctors is limited. Therefore, publicity and education about

private doctors among the elderly should be strengthened. Social and conventional media can be used to strengthen the publicity of private doctors, so as to not only improve the elderly's understanding of private doctors, but also improve the public's awareness of private doctors and broaden the development path of private doctors in China. Cognitive biases lead to a significant lack of social demand for the deployment of private health consultants. Therefore, to improve this cognitive bias, it is better to improve the elderly's understanding of and demand for private doctor services.

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9 DISCLOSURE STATEMENT

No potential conflict of interest was reported by authors.

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