

# Study on the Willingness of Tianjin College Students to Pay for Physical Examination at Their Own Expense

Fang Yuan, Yueying Liang and Yu Zhang\*

Tianjin University of Traditional Chinese Medicine, Tianjin, China

**Keywords:** College students; Physical examination; Logistic regression

**Abstract:** Objectives: To explore the willingness of college students in Tianjin to pay for physical examination at their own expense and its influencing factors, this paper provides a basis for formulating and improving the related policies of college students' physical examination. Methods: We adopt random sampling method to investigate 1410 college students in Tianjin area with self-designed questionnaire, and use spss19.0 for Logistic regression analysis. Results: The family per capita monthly income of the respondents, whether they had family history or previous diseases, whether the university had carried out health examination publicity, the evaluation of physical examination by the students around them are positively correlated with their willingness to pay for physical examination at their own expense, and the P values were all less than 0.05, which was statistically significant. Conclusions: First of all, the school should attach importance to the publicity of students' physical examination and increase the publicity efforts, such as setting up relevant courses, pushing articles on public accounts, holding online competitions and so on. Secondly, the school should broaden the channels for students to participate in the physical examination and comprehensively consider the physical examination needs of college students. For example, the school hospital and the professional should be contacted to provide regular physical examination opportunities for students. At the same time, the school should also pay attention to the health management of the students after the physical examination, so as to provide guidance and Suggestions for enhancing the healthy behaviour of college students and changing the unhealthy lifestyle.

## 1. Introduction

Physical examination is based on the new concept of modern health and modern medical model, through medical means and methods to conduct an overall psychosomatic examination of the examinee, to understand the overall health status of the examinee, the early detection of disease clues and the diagnosis and treatment of health hazards. With the promulgation of the outline of "healthy China 2030" plan, it has become a national priority to improve the national health level and realize the goal of "healthy China". As the main force in the new era, the health status of college students is not only related to the development of individuals, but also to the future of the country<sup>[1]</sup>. At present, the social competition is becoming increasingly fierce and the employment situation is becoming increasingly grim. As a special group bearing the high expectations of the society and parents, college students are facing multiple pressures from study, work and life, and their health condition is not optimistic. Physical examination, as the most intuitive way to understand the body status, is the premise and guarantee of healthy life and study for college students. Based on this, we carried out a survey on college students' willingness to pay for physical examination at their own expense and put forward Suggestions for reference.

## 2. Data sources and sample characteristics

### 2.1. Data collection and processing

In this study, a self-compiled questionnaire was used to investigate college students in Tianjin. A total of 1506 questionnaires were issued by random sampling method, and 1410 valid

questionnaires were finally obtained, with an effective recovery rate of 93.6%.The collected information was representative to understand the willingness of college students in Tianjin to pay for physical examination at their own expense, and the logistic regression analysis is carried out using spss19.0 software.

## 2.2. Sample characteristics

### 2.2.1. Individual characteristics of college students

Table 1 is the frequency and statistical description of basic characteristics of college students, including the gender, grade, major, per capita monthly income of the respondents, family history or previous history of diseases, and the body status.

Table 1 Frequency and statistical description of individual characteristics of college students

items	category	frequency	Effective percentage	cumulative percentage	mean value	standard deviation
gender	male	640	45.4	45.4	0.37	0.48
	female	770	54.6	100.0		
grade	freshman	168	11.9	11.9	2.50	0.89
	Sophomore	560	39.7	51.6		
	Junior	522	37.0	88.7		
	Senior	134	9.5	98.2		
	Senior 5	26	1.8	100.0		
specialty	Non-traditional Chinese medicine	882	62.6	62.6	0.37	0.48
	Traditional Chinese	528	37.4	100.0		
Monthly income per household	3,000yuan and below	222	15.7	15.7	2.69	1.19
	3,001yuan–4,000yuan	464	32.9	48.7		
	4,001yuan—5,000yuan	392	27.8	76.5		
	5,001yuan—6,000yuan	188	13.3	89.8		
	6,001yuan and above	144	10.2	100.0		
Whether there is a family history or a historical disease	No	978	69.4	69.4	0.31	0.46
	yes	432	30.6	100.0		
Physical status	Poor health and frequent illness	70	5.0	5.0	3.13	1.07
	Poor health, often have minor problems	362	25.7	30.6		
	In general health, occasionally ill	446	31.6	62.3		
	Good health, rarely sick	374	26.5	88.8		
	The body is very good	158	11.2	100.0		

### 2.2.2. Cognitive characteristics of physical examination knowledge

In the survey, the cognition of health check-up knowledge includes the following questions: the definition of health check-up and the level of understanding of the classification of medical examination, the optimal period of health check-up and the degree of recognition of the role of physical examination. Table 2 shows the cognitive characteristic frequency and statistical description of health examination knowledge.

Table 2 Cognitive characteristic frequency and statistical description of health check-up knowledge

items	category	frequency	Effective percentage	cumulative percentage	mean value	standard deviation
Definition of physical examination	Have no idea	88	4.2	6.2	2.91	0.93
	Do not know much about	360	17.0	31.8		
	General understanding	602	28.5	74.5		
	Understand better	310	14.7	96.5		
	Know very well	50	2.4	100.0		
Classification of physical examination	Have no idea	92	4.3	6.5	2.91	0.97
	Do not know much about	382	18.1	33.6		
	General understanding	574	27.1	74.3		
	Understand better	286	13.5	94.6		
	Know very well	76	3.6	100.0		
The best time for a healthy checkup	There has been obvious discomfort, hope to get the cause of the disease through a general examination	168	11.9	11.9	2.30	0.67
	When you are sub-healthy, you want to check for the underlying cause	646	45.8	57.7		
	Get regular checkups when you're healthy	596	42.3	100.0		

### 2.2.3. The objective environmental characteristics that influence self-paid physical examination

In the survey design, we consider whether we are willing to carry out physical examination at our own expense and whether we think it is necessary for the school to arrange regular physical examination as important issues. In addition, whether the university has carried out health examination publicity, the professional level of the physical examination institution, privacy protection, service attitude, price setting and the physical examination evaluation of the surrounding students are also considered as objective environmental variables that affect the willingness of college students to conduct self-funded physical examination. Table 3 shows the frequency table and descriptive statistics of the above variables.

Table 3 Objective environmental characteristic frequency and statistical description that influence self-paid physical examination

items	category	frequency	Effective percentage	cumulative percentage	mean value	standard deviation
Whether the university has carried out the promotion of physical examination	NO	550	39.0	39.0	0.61	0.49
		860	61.0	100.0		
	YES					
Professional level	No effect at all	62	4.4	4.4	3.92	1.02
	Basically no impact	54	3.8	8.2		
	It doesn't matter	256	18.2	26.4		

	More influential	600	42.6	68.9		
	Very influential	438	31.1	100.0		
Privacy protection	No effect at all	26	1.8	1.8	3.93	0.97
	Basically no impact	96	6.8	8.7		
	It doesn't matter	270	19.1	27.8		
	More influential	570	40.4	68.2		
Service attitude	Very influential	448	31.8	100.0	3.89	0.92
	No effect at all	26	1.8	1.8		
	Basically no impact	66	4.7	6.5		
	It doesn't matter	330	23.4	29.9		
The price set	More influential	604	42.8	72.8	3.90	3.90
	Very influential	384	27.2	100.0		
	No effect at all	20	1.4	1.4		
	Basically no impact	66	4.7	6.1		
Evaluation of physical examination by students around	It doesn't matter	336	23.8	29.9	3.87	0.96
	More influential	598	42.4	72.3		
	Very influential	390	27.7	100.0		
	No effect at all	26	1.8	1.8		
	Basically no impact	96	6.8	8.7		
	It doesn't matter	312	22.1	30.8		
	More influential	578	41.0	71.8		
	Very influential	398	28.2	100.0		

### 3. Model specification

The subject of this study is whether college students are willing to participate in health examination at their own expense. According to the previous description, college students' willingness to pay for physical examination at their own expense is affected by many factors, but there are only two final results, namely "willing to pay for physical examination at one's own expense" and "unwilling to pay for physical examination at one's own expense", which is a [0,1] dichotomy variable. Therefore, the analysis of college students' willingness to pay for physical examination at their own expense is a discrete choice problem, and the probability model is more suitable. The binary Logistic model is an effective model for the explained variables to be binary variables, which is convenient for multiple regression analysis. The basic form of Logistic model is as follows:

$$p(y) = \frac{1}{1 + \exp[-(\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_m X_m)]} \quad (1)$$

In the formula,  $\beta_0$  is the constant term or intercept,  $\beta_1, \beta_2, \dots, \beta_m$  is the regression coefficient of the model,  $X$  is the explanatory variable, and  $P(y)$  is the probability of occurrence of the explained variable [2].

According to the purpose of the study, the sample with clear intention was taken as the research object, and whether college students in Tianjin were willing to participate in physical examination at their own expense was taken as the dependent variable ( $y$ ), with a value of 0 or 1 (willing to pay for physical examination at their own expense,  $y = 1$  was defined; Unwilling to pay for physical examination, define  $y=0$ ). At the same time, the factors that affect college students' willingness to pay for physical examination at their own expense are taken as explanatory variables, which are mainly divided into three categories: college students' individual characteristic variables ( $X_p$ ), health physical examination knowledge cognition characteristics ( $X_n$ ), and objective environment characteristics ( $X_k$ ), among which several variables are selected for each category. Using the above

factors as independent variables, the econometric model of college students' willingness to pay their own way for physical examination was constructed as follows:

$$y=F(x_1, x_2, x_3, \dots x_m) \quad (2)$$

#### 4. Measurement test

In this study, SPSS19.0 software and Enter method were used to carry out Logistic regression test on the established model (table 4). Only variables with significance level above 0.05 were listed in the table. In addition, during the regression test, variables enter the model in different order, which to some extent reflects the contribution of different variables to model interpretation. In general, variables that enter the model first contribute more to model interpretation than those that enter the model later.

Table 4 Logistic regression test of college students' willingness to pay for physical examination at their own expense in Tianjin area

Items	Explanatory variables	Model (enter) mode					
		B	S.E.	Wals	df	Sig.	Exp (B)
Individual characteristics of college students ( $X_p$ )	Monthly income per household	0.25	0.06	19.86	1.00	0.00	1.28
	Whether there is a family history or a historical disease	0.29	0.14	4.31	1.00	0.04	1.34
The objective environmental characteristics that influence self-paid physical examination ( $X_k$ )	Whether the university has carried out the promotion of physical examination	0.71	0.13	31.23	1.00	0.00	2.03
	Evaluation of physical examination by students around	0.14	0.06	4.55	1.00	0.03	1.15
	constant	2.48	0.38	43.34	1.00	0.00	0.08
Overall test of model	-2 logarithmic likelihood	1575.21					
	Cox and Snell R squared	0.09					
	Nagelkerke R party	0.13					
	Chi-square test value	7.03					

#### 4.1. The influence of college students' individual characteristics on their willingness to pay for physical examination at their own expense

##### 4.1.1. There was a significant positive correlation between the family per capita monthly income and the willingness to pay for physical examination

According to the survey, college students are more willing to pay for the physical examination at their own expense in the families with more per capita monthly income. In the model results, the B value of this item is 0.25, and the P value is 0.000, that is, the per capita monthly income of the family is positively correlated with the willingness of college students to pay for physical examination at their own expense, and it reaches a significant level, which is consistent with the reality. In families with a high economic level, the cost of physical examination accounts for a small proportion of the total expenditure of the family, and the family pays more attention to physical quality, which also affects the children who grow up in this environment. Therefore, the per capita monthly income of the family is an important factor affecting the willingness of college students to pay for physical examination at their own expense.

#### **4.1.2. There was a significant positive correlation between family history or previous history of disease and willingness to pay for physical examination**

Family history of disease refers to whether the main family members have an important history of disease, such as epilepsy, tuberculosis, genetic diseases. Prior history of disease is primarily concerned with an individual's history of disease. The model results show that the B value of the variable is 0.29, the P value is 0.04, the Exp (B) value is 1.34, that is, the variable is significantly positively related to the willingness of college students to check-up at their own expense, while the willingness of students with family history or past history of disease severity to self-funded medical examination is 1.34 times that of students with no family history or historical disease, which is in line with the actual situation. Because students with such diseases can master their body dynamics through regular physical examination, they will have a deeper understanding of their family history or previous history of diseases. If the malignant development trend of such diseases is found after physical examination, these students can get corresponding treatment within the best time for diagnosis and treatment.

#### **4.2. The influence of the objective environmental characteristics of physical examination on the willingness to pay for physical examination**

##### **4.2.1. There was a significant positive correlation between health examination publicity and self-funded physical examination intention**

From the model results, the B value of the variable is 0.71, P value is 0.04, Exp (B) is 2.03, indicating whether the university to carry out health check-up publicity on the willingness of college students to self-funded medical examination has a significant impact, and in the university that has carried out health check-up publicity, their students' willingness to self-funded medical examination is 2.03 times that of university students who have not carried out health check-up publicity. Physical examination is the most intuitive way to clarify the current situation of the body, as well as an important link and basis of health management. Therefore, the publicity of physical examination in universities can help college students have a preliminary understanding of health management, cultivate their awareness of health management, and further maintain their own health.

##### **4.2.2. The evaluation of physical examination was positively correlated with the willingness to pay for physical examination**

Similarly, in the study design, we divided the influence degree of physical examination evaluation of the surrounding students on the willingness of the respondents to pay for physical examination into five categories, from no influence at all to full influence, with values of 1-5 respectively. According to the model results, the B value of this item is 0.14, and the P value is 0.03, indicating that the evaluation of physical examination by the surrounding students is positively correlated with the willingness of the respondents to pay for physical examination at their own expense, and reaches a significant level, which is consistent with the reality. After participating in the physical examination, this kind of students have a better understanding of health check-up and gradually establish their own awareness of disease prevention and control, that is, "early detection, early diagnosis, early treatment". At the same time, they will share the importance and necessity of physical examination with the students around them, which will influence the views and cognition of the students around them on physical examination, to some extent, and make them gradually pay attention to their own health status and physical examination.

## **5. Conclusions and suggestions**

### **5.1. Conclusions**

The results showed that whether the university had carried out health examination publicity, the per capita monthly income of the family, the evaluation of physical examination by the surrounding students and whether there was a family history or previous disease were positively correlated with the willingness of college students to pay for physical examination at their own

expense, and the P values were all less than 0.05, which was statistically significant. At the same time, according to the output of model Wals results, the contribution of the above influencing factors to model interpretation was 31.23, 19.86, 4.55, and 4.31, respectively. Therefore, whether the university had conducted health examination publicity contributed the most to model interpretation, and whether there was family history or previous history of disease contributed the least to model interpretation.

## 5.2. Suggestions

First of all, the school should attach importance to the publicity of students' physical examination and strengthen the publicity. At present, the development of chronic diseases as a whole shows a younger trend, if students do not have an accurate understanding of their own physical condition, it will be likely to bury the disease risk. Some diseases only reach the onset of the disease, their symptoms will be revealed, when students realize that the physical discomfort can't be completely treated or more difficult to heal, which will not be conducive to the development of students' physical and mental health. Therefore, the school should increase the publicity of physical examination. First of all, we can consider the relevant courses of health management and physical examination as the undergraduate compulsory system. By emphasizing the importance and necessity of physical examination, it is beneficial to cultivate students' awareness of self-health management and lay a theoretical foundation for improving students' willingness to pay for physical examination at their own expense. Secondly, the school can make full use of the Internet platform to carry out the online and offline publicity mode, so as to diversify the forms of publicity and increase college students' interest in physical examination. For example, schools can regularly hold lectures on health management or physical examination and put up posters for publicity, while using WeChat platform to push articles related to college students' health management or physical examination, or they can hold online or offline knowledge contests to let more college students understand physical examination and participate in them.

Secondly, the school should also broaden the channels for students to participate in the physical examination, and comprehensively consider the physical examination needs of college students. According to the survey statistics, there are three main types of physical examination for 1410 respondents, including on-campus physical examination (35.5%), self-funded physical examination (34%) and regular family physical examination (24.7%). And some scholars have found that college students in China mainly participate in health physical examination on campus for admission, and a few universities will carry out mid-term physical examination or graduation physical examination<sup>[3]</sup>. In addition, the survey found that 48.8% of college students think it is necessary to arrange regular physical examination, which indicates that there is an obvious demand for physical examination among college students in Tianjin, so the school should broaden the channels of physical examination for students. For example, the university can cooperate with the university hospital, professional physical examination center and other institutions to provide regular physical examination opportunities for students. At the same time, during the practical implementation of physical examination for college students, such issues as physical examination frequency, physical examination form and acceptability of cost should be considered comprehensively to meet the physical examination requirements of most college students as far as possible [3]. In addition, the school should also pay attention to the health management of students after the physical examination, so as to provide guidance and Suggestions for enhancing the healthy behavior of college students and changing the unhealthy lifestyle.

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