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EFFECTS OF MEDICAL SECURITY SATISFACTION AND TRUST IN DOCTORS ON SUBJECTIVE WELL-BEING: EVIDENCE FROM CHINA

Xiaomei Gong[1]
Jiaping Zhang[2+]

[1]*College of Economics and Trade, Hunan University of Technology and Business, Changsha 410205, China.*
Email: 15191561635@163.com Tel: +86-731-88686693
[2]*School of Economics and Management, Tongji University, Shanghai 200092, China.*
Email: 1710232@tongji.edu.cn Tel: +86-21-65982272

(+ Corresponding author)

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ABSTRACT

How to improve residents' well-being is regarded as an important goal of sustainable economic development. Although health care has an important impact (directly and indirectly) on subjective well-being (SWB), existing literature rarely empirically investigated the impact of individual's satisfaction with health care on SWB, especially in developing countries like China, where the health care level has obviously lagged behind the public health needs and the speed of economic development. In addition, China is also facing a tense doctor-patient relationship situation in recent years. Based on the data from the Chinese Social Survey (CSS) for 2015, this paper empirically analyzes the impact of medical security satisfaction and trust in doctors (to reflect doctor-patient relationship) on Chinese people's SWB. We have adopted a variety of methods for robust test, and used the propensity score matching (PSM) method to deal with the endogenous problems that may be caused by "selection bias". The results show that both the medical security satisfaction and trust in doctors have positive effects on SWB, indicating that the improvement of medical security and doctor-patient relationship can contribute to Chinese people's SWB in the new era. This study has certain guiding significance for the implementation of "healthy China" strategy, and further enriches the related research of health economics.

Contribution/Originality: This study is one of very few studies which has directly investigated the predictors of individual's subjective well-being from the perspective of health care satisfaction. This paper further enriches the relevant studies on health economics and has important policy implications for developing countries.

1. INTRODUCTION

Improving residents' well-being is considered an important aspect of sustainable economy. The subjective well-being (SWB), i.e., the individual's subjective perception of happiness (or life satisfaction) according to their own standards, has been one of the most important topics studied by scholars in recent decades (Lans *et al.*, 2000; Adam *et al.*, 2018; Li *et al.*, 2018; Ma *et al.*, 2018; Heintzelman and Diener, 2019). Previous research has shown that both the physical and psychological health are key indicators of the subjective well-being (Cubí-Mollá *et al.*, 2014; Wang *et al.*, 2015; Lamu and Olsen, 2016; Binder and Buenstorf, 2018; Meléndez *et al.*, 2019; Zeng and Yu, 2019) and the level of health care is an important guarantee for people's health status (Currie and Gruber, 1996; Andersen, 2018; Calvi and Mantovanelli, 2018; Husdal *et al.*, 2018; Yu and Zhu, 2018; Espey *et al.*, 2019; He and Nolen, 2019; Lebrun-Harris *et al.*, 2019). However, there is still lack of empirical literature (to the best of the author's knowledge) directly investigating the impact about people's satisfaction with health care on their subjective well-being.

Began in the late 1970s reform and opening up, China's economy has achieved sustained and rapid development for 40 years, and the per capita gross domestic product (GDP) has increased from 385 yuan in 1978 to 59201 yuan in 2017 (China National Bureau of Statistics, 2019). According to the general regular of economic development, with the improve of income level, people's needs and investment in health will increase simultaneously (Maslow, 1954). The quantity and the quality of accessible medical services are directly related to people's life quality and their health status. However, the current situation is that China's health care has long lagged behind the growth of residents' demand and the speed of economic development (Chen *et al.*, 2016). In particular, with the frequent occurrence of medical disputes and medical violence in recent years, the current situation of health care in China has been more and more concerned. As shown in Figure 1, the number of medical dispute cases accepted by Chinese courts increased rapidly from 2004 to 2016, which has also shown the importance of strengthening medical security construction for China's sustainable economic development.

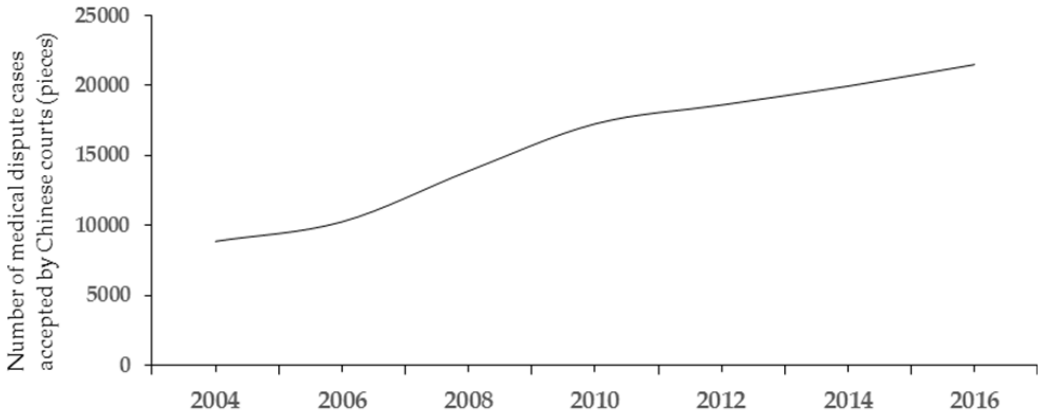

Figure-1. The number of medical dispute cases accepted by Chinese courts between 2004 and 2016.
Source: Sohu Network. Available from http://www.sohu.com/a/271543922_377326.

In recent years, the Chinese government has attached great importance to the building of a national basic medical care system. In 2016, The State Council of the People's Republic of China has passed the "Outline of Healthy China 2030 Program". The 19th National Congress of the Communist Party of China (NCCPC) has also explicitly regarded the "healthy China" as an important long-term development strategy of China in the future. Undoubtedly, the "healthy China" development strategy not only reflects the Chinese government's determination to promote the comprehensive improvement of the quality on medical services in the new era, but also provides an important guarantee for enhancing the well-being of Chinese residents. Interestingly, although the importance of current medical security level and doctor-patient relationship for Chinese residents' well-being is well known, there are still few empirical researches on the effects of those factors on people's subjective well-being.

The current study aims to make some beneficial explorations on the influence of people's medical security satisfaction and trust in doctors (to reflect doctor-patient relationship) on the Chinese people's subjective well-being. Based on Chinese Social Survey (CSS) for 2015, our study shows that both people's medical security satisfaction and trust in doctors are positively correlated with subjective well-being. Compared with the existing literature, this article's main contributions are embodied in the following aspects. Firstly, this paper directly analyzes the source of people's subjective well-being from the perspective of health care satisfaction, which further enriches the relevant studies on health economics and welfare economics. Secondly, this paper fully considers the endogenous problems that may exist in the empirical model by utilizing propensity score matching (PSM) method, and makes a robustness analysis of the estimation results from multiple perspectives. Therefore, the research conclusion is reliable and credible in this paper. Last but not the least, in this paper, micro survey data at the national level in China are selected, which is well representative, so the research conclusions are also of great practical significance.

The rest of the paper is mainly arranged as follows: The second part is a simple review of the existing literature. The third part explains relevant data sources, variable settings and the empirical model construction. The fourth part is empirical results. Finally, the last part is the research conclusions and the related policy suggestions.

2. BRIEF LITERATURE REVIEW

2.1. Research Related to Subjective Well-Being

Well-being has been one of the most buzz words during the past decades. The word well-being (or happiness) is often mentioned in almost all discussions or activities related to human life (Smith and Diekmann, 2017). The classic literature on income and happiness conducted by American economist (Easterlin, 1974) namely "Does economic growth improve the human lot? Some empirical evidence" found that within a country, the level of personal income has a significant positive impact on individuals' subjective well-being, and the average subjective well-being of high-income groups is higher than that of low-income groups. However, individuals' subjective well-being does not continue to increase with GDP or income growth over time, which is also called the "Easterlin paradox". Subsequently, the "Easterlin paradox" has attracted scholars' continuous attention on subjective well-being. These studies often attempt to answer why there are significant differences in subjective well-being across individuals, social organizations and countries. From the existing literature, the relevant research can be summarized as follows:

Above all, the connotation and theoretical research of subjective well-being. Subjective well-being is a person's way of looking at different aspects of life, which can be defined as the subjective expression of personal happiness, including the assessment of one's emotional state and life satisfaction (Diener, 2006; Luchesi *et al.*, 2018). Feeling happy from the bottom of one's heart is an important condition for maintaining health and cultivating career (Datu *et al.*, 2017; Kamthan *et al.*, 2019). In the related literature of subjective well-being, the word subjective well-being is often used alternately with happiness, life satisfaction, and quality of life (Chitchai *et al.*, 2018). Some scholars believe that the subjective well-being includes three dimensions, including negative and positive emotions, as well as life satisfaction (Diener *et al.*, 1985; Vittersø and Nilsen, 2002). According to this definition, life satisfaction mainly belongs to people's cognitive judgment. In cognitive theory, subjective well-being is the product of human thinking and evaluation process. While the two dimensions of positive and negative emotions involve emotion (or feeling), i.e., subjective well-being is perceived as feeling and emotion, which is a process by which people constantly evaluate their feelings (positive or negative). Because there are many factors that make people happy, which may be different for different people. Therefore, the factors that make people happy are a complex system. However, it can be said that the feeling of subjective well-being is an expression of their need to meet (Chitchai *et al.*, 2018).

The second aspect of SWB research involves its measurement and the analysis on the situation of SWB in various regions. The measurement of SWB is an important prerequisite for the quantitative research related to this topic. Scholars compile SWB measurement scales under different situations and compare their validity and reliability (Lyubomirsky and Lepper, 1999; Bobbitt *et al.*, 2005; Lim, 2008). Early measurements of SWB were usually based on English-speaking context. In recent years, scholars have also gradually started to compile SWB scales based on different language semantics or cultural context (e.g., Qi *et al.* (2015); Lindert *et al.* (2015)). Many previous empirical researches often measured subjective well-being by coding respondents' responses to a single question (e.g., in general, how satisfied or unsatisfied are you with your life overall?), including Hojman and Miranda (2018); Asadullah *et al.* (2018); Zeng and Yu (2019) and Chen *et al.* (2019) etc. Some large-scale social surveys also take the subjective well-being and related factors into consideration such as European Social Surveys, China General Social Survey (CGSS) and China Health and Nutrition Survey (CHNS).

Another point that has attracted the most attention from scholars is to explain the differences of individual subjective well-being from different perspectives. First of all, there are still a large number of studies continuing to investigate the impact of economic factors on subjective well-being. Relevant studies suggest that although the

increase of absolute income can improve subjective well-being by satisfying people's most basic material needs and personal preferences, relative income is crucial to subjective well-being in the long run (Ferrer-I-Carbonell, 2005; Wang and Vanderweele, 2011; Asadullah *et al.*, 2018) i.e., people will compare their income with others, their previous income and their expected income, and the comparison results can influence the subjective well-being. Meanwhile, the impact of unemployment on residents' happiness has also received extensive attention (Norton *et al.*, 2018). In addition to economic factors, a growing number of studies have focused on the impact of other factors on subjective well-being. To sum up, it mainly includes the following aspects.

1) Institutional factors. The classicism economists (e.g., Smith, David Ricardo and John Stuart Mill) have stressed the importance of institutions, public policy and the rule of law in shaping economic performance and human well-being. Some scholars have compared the differences in life satisfaction between post-socialist countries and developed countries, and investigated the role of political systems in explaining the differences. They found that the nomocracy factor can explain the difference in overall life satisfaction between advanced and transitional societies, and suggested that as the ceaseless improvement of system and the macroeconomic conditions, post-socialist countries may complete the transformation process and achieve the equal quality of life as western countries (Nikolova, 2016). Other scholars have also analyzed the impact of institutional factors on subjective well-being in a certain country. For example, Dang *et al.* (2014) found that China's household registration system has an important impact on residents' happiness, i.e., the subjective well-being of residents with local household registration is higher than that of residents without local household registration. 2) The socioeconomics and demographic factors, including age, gender, marriage status, education, religious belief, social capital, political attitudes, and national culture (Mookerjee and Beron, 2005; Martin and Cooper, 2017; Kristoffersen, 2018; Liu *et al.*, 2019; Main *et al.*, 2019) etc. 3) Technical factors. As humans move into the digital age, scholars have gradually begun to pay attention to the impact of the Internet and other new media on people's subjective well-being in the recent years. However, there is still no consensus on the impact of the Internet use on well-being. Castellacci and Tveito (2018) comprehensively summarized the literature on Internet use and well-being, and found that the Internet mainly through four channels, namely improving the flexibility of time use, creating new activities, obtaining information and as a major communication tool to improve well-being. Some other scholars believe that the purpose of using the Internet has different effects on people's well-being. For example, using the Internet for activities such as non-payment, fraud and snooping is usually associated with lower well-being (Mitchell *et al.*, 2011). 4) Influence of other factors on people's subjective well-being, such as climate and environmental factors (Du *et al.*, 2018; Li *et al.*, 2018) tourism (Smith and Diekmann, 2017) city size (Hiscock *et al.*, 2017) etc.

2.2. Health Care, Health Status and the Well-Being

The impact of health status on individual well-being is also an important focus of happiness economics and health economics. Numerous studies have shown that there is a close relationship between health status and well-being (Okun *et al.*, 1984; Hayes and Ross, 1986; Røysamb *et al.*, 2003; Zhang *et al.*, 2018). Based on the national survey data from Finland, Poland and Spain between 2011 to 2012, Miret *et al.* (2014) found that there was still a strong correlation between health and happiness after controlling for socio-demographic characteristics such as age and income. Surprisingly, however, others studies have shown that illness does not have a significant impact on well-being, i.e., many people still live high-quality lives even though they have severe and persistent disabilities, which is also known as the "disability paradox" (Albrecht and Devlieger, 1999; Drum *et al.*, 2008). Some studies have explained the "disability paradox" by suggesting that people have certain adaptability to diseases (Oswald and Powdthavee, 2008; Moller, 2011).

On the one hand, the improvement of medical care level can indirectly affect people's well-being by influence their health status. Hadley and Waidmann (2006) found that increasing insurance coverage to Americans between the ages of 55 and 64 would improve health status and increase survival. Based on a study of 2000 patients with

cardiovascular disease in the UK, Fichera *et al.* (2018) found that doctors' efforts could reduce the frequency of alcohol consumption and smoking among patients. On the other hand, the quality of medical services, the level of medical environment and doctor-patient relationship can also directly affect people's well-being. Research has shown that improving the medical work environment to reduce the occurrence of medical errors has an important impact on improving the quality of life and well-being both for the doctors and patients (Elwahab and Doherty, 2014). Generally speaking, medical environment is also an important reflection of the quality of life. A perfect medical service system can make people feel better about their own health status and cooperate with treatment more actively when they are ill (Qadire and Khalaileh, 2017; Uğurluoğlu *et al.*, 2019) thus enhancing people's satisfaction with the quality of life. In addition, Lee *et al.* (2013) also pointed out that subjective well-being can be an important method to evaluate the quality of healthcare.

As discussed above, although the academic circle has conducted extensive research on the individual's subjective well-being, and the health care has an important influence on individual's subjective well-being (directly or indirectly), few literature directly investigates the impact of people's satisfaction with health care on their subjective well-being, especially for developing countries like China, which are experiencing huge economic development and the lack of medical resources concurrently. From the existing studies, for a long time, medical-related research literature has paid more attention to the impact of medical security (medical insurance) on individual economic activities, such as medical expenditure or consumption, including Guariglia and Rossi (2004); Bai and Wu (2014); Geng *et al.* (2018); Gallagher *et al.* (2019); Chen *et al.* (2019) etc. Therefore, econometric method will be adopted in the rest of this paper to supplement the literature in this aspect based on China's nationwide survey data.

3. DATA SOURCE, VARIABLE SETTING AND MODEL SELECTION

3.1. Data Source

This study uses the data from the Chinese Social Survey for 2015(CSS2015), which is a nationwide survey project hosted by the Institute of Sociology, Chinese Academy of Social Science. The first Chinese Social Survey was conducted in 2005. The purpose of the Chinese Social Survey is to obtain data about China's social changes in the transition period through a long-term survey of the national public's employment, family and social life, social attitudes, so as to provide detailed and scientific basic information for social science research and government decision-making (see e.g., Zhang *et al.* (2019)). The CSS2015 covered 30 provincial-level administrative units (excluding Xinjiang) in mainland China, including 148 counties (districts). The sample age was 18-70 years old, and a total of 10243 questionnaires were completed in 2015.

3.2. Variable Settings

3.2.1. Dependent Variable

The dependent variable in this paper is respondents' subjective well-being (denoted by SWB). Consistent with many previous studies, this paper also uses respondents' answers to a single question in the CSS2015 to measure their subjective well-being, namely "in general, do you think you are very happy?". The respondents answered "strongly disagree" to "strongly agree" assigned 1-5. Apparently, the greater the SWB is, the higher the respondents' subjective well-being will be.

3.2.2. Core Explanatory Variable

The core explanatory variable in this paper is the level of health care. According to CSS2015, this paper mainly uses respondents' satisfaction with the medical security (denoted by medical security satisfaction) and their trust in doctors (denoted by trust in doctors) to measure the level of health care, respectively. Specifically, the medical security satisfaction is obtained through the subjective evaluation of medical security by the respondents, and is

assigned a value of 1-10. The higher the value is, the more satisfied the respondents are with the medical security. Analogously, trust in doctors was obtained by asking respondents how much they trust in doctors. Respondents answered "very distrust", "distrust", "trust" or "very trust" is assigned a value of 1-4, respectively. As discussed above, the doctor-patient relationship in China is now very tense. The adoption of trust in doctors can reflect the doctor-patient relationship to some extent. The higher the trust in doctors is, the more harmonious the doctor-patient relationship will be.

3.2.3. Control Variable

As shown in the literature review above, there are many factors influencing individual's subjective well-being. Therefore, referring to the research of Asadullah *et al.* (2018); Wu and Li (2017) the control variables in this study mainly include the following categories: 1) the social and demographic characteristics factors, including gender, age, age square, nationality, religious belief, political status, household registration type, education level and marital status. 2) income factors, including absolute income and relative income. 3) technical factors. Considering that China has become the largest Internet user in the world, the Internet has been closely intertwined with the basic necessities of life of Chinese residents, and has become an important factor affecting the their subjective well-being.

Table-1. Variable Definition and descriptive statistics.

Variables	Definition	N	Mean	Standard deviation.
SWB	Do you think you are very happy? Five categories: 1= "strongly disagree" to 5= "strongly agree".	10 233	3.572	1.014
Medical security satisfaction	Subjective evaluation of medical security. The lowest is 1 and the highest is 10.	9 883	6.120	2.329
Trust in doctors	Degree of trust in doctors. Four categories: 1= "very distrust" to 4= "very trust".	9 999	2.966	0.677
Gender	Male=1, female=0	10 243	0.454	0.498
Age	Age in 2015	10 242	46.517	13.642
Nationality	Han =1, otherwise =0	10 228	0.921	0.269
Religious belief	Faith in religion =1, otherwise =0	10 231	0.155	0.362
Political status	Communists =1, non-communists =0	10 211	0.098	0.297
Household registration type	Agricultural household =1, non-agricultural household =0	9 919	0.562	0.496
Education level	Illiteracy =0; primary school =6, junior high school =9; high school, technical secondary school, vocational high school =12; college =16; graduate student = 19	10 225	8.702	4.516
Marital status	Divorce or widowed = 1; unmarried =2; in marriage =3	10 232	2.790	0.530
Absolute income	Logarithm of per capita household income plus 1	9 637	9.174	1.124
Relative income	The economic status of an individual in his or her area. Five categories: 1="upper socioeconomic status" to 5="Lower socioeconomic status".	10 137	3.818	0.895
Internet	Use the Internet=1, otherwise =0	10 235	0.384	0.486
House	Owned housing =1, otherwise =0	10 221	0.862	0.345
Car ownership	Have cars =0 (including domestic and imported cars), otherwise=1	10 222	0.244	0.430
Social	Social activity satisfaction. The lowest is 1 and the highest is 10.	10 203	6.074	2.170
Entertainment	Satisfaction with leisure, entertainment or cultural activities. The lowest is 1 and the highest is 10.	10 173	5.291	2.330

Source: Authors Computation, 2018 (Stata 15.0).

Therefore, this paper also adds residents' Internet use level (denoted by Internet) into the control variables. 4) family assets and social capital factors, mainly including the status of homeownership (denoted by house), car ownership, social activity satisfaction (denoted by social) and entertainment satisfaction (denoted by entertainment). In addition, considering that China is a vast country, and the living conditions and medical security in different

regions are quite different, this paper also adds the province dummy variable into the benchmark model to control the provincial fixed effect.

It should be noted that the data in this paper samples of respondents who answered uncertainties (i.e., unclear; refuse to answer; inappropriate) are all removed from the data. Finally, the definitions and descriptive statistics of all variables are shown in Table 1.

3.3. Model Setting and Estimation Methods

The dependent variable SWB is a discrete variable of 1–5, so this paper uses the ordered probit regression model to estimate the benchmark model. Specifically, in order to investigate the influence of medical security satisfaction and trust in doctors on people's subjective well-being, this paper constructs the following benchmark regression model:

$$SWB_i^* = \alpha_0 + \alpha_1 Health\ care_i + \beta X + \varepsilon_i \quad (1)$$

Where:

SWB*= The latent variable of SWB

Health care= The core explanatory variable (medical security satisfaction or trust in doctors)

X= A set of control variables that may affect SWB

ε=The error term

i=The ith resident

SWB* and SWB satisfy the following relationship:

$$SWB = \begin{cases} = 1, & SWB_i^* \le R_1 \\ = 2, & R_1 < SWB_i^* \le R_2 \\ = 3, & R_2 < SWB_i^* \le R_3 \\ = 4, & R_3 < SWB_i^* \le R_4 \\ = 5, & R_4 < SWB_i^* \end{cases} \quad (2)$$

Where:

R_1, R_2, R_3, R_4 and R_5 = The parameters (cutoff points) that need to be estimated and satisfy $R_1<R_2<R_3<R_4<R_5$.

4. EMPIRICAL RESULTS

4.1. Benchmark Regression Analysis

As a comparison, this paper first estimates the benchmark model with the ordinary least square method (OLS), and the results are shown in Table 2. In addition, we report the robust standard errors in all results. Column (1) only examines the effect of medical security satisfaction on SWB, and column (2) only examines the effect of trust in doctors on SWB. Columns (3) and (4) are the estimation results obtained by adding control variables on the basis of columns (1) and (2) respectively. Compared with columns (1) and (2), the R^2 in columns (3) and (4) increase respectively, indicating that it is necessary to add control variables. It can be seen that the coefficients of the core explanatory variables (medical security satisfaction and trust in doctors) in columns (1)—(4) are all positive, and significant at 1%. The estimation results of the ordered probit model are shown in the Table 3. Analogously, the estimation results in the Table 3 are highly consistent with that in Table 2, which further verifies the reliability of the estimation results. The following analysis is based on the estimation results of the columns (3) and (4) in the Table 3.

As shown in the columns (3) and (4) of the Table 3, the coefficient of the medical security satisfaction is 0.047 (significant at 1%), and the coefficient of the trust in doctors is 0.091 (significant at 1%), indicating that the improvement medical security and doctor-patient relationship can significantly increase Chinese people's subjective well-being. With the further development of China's economy, the Chinese residents' living standard will be

steadily improved, and their demands for health care would increase at the same time. However, the present situation is that both the quantity and the quality of medical or health services in China need to be further improved. Problems such as "difficult and expensive access to medical services" still need to be paid close attention by relevant departments, and the implementation of effective measures to improve medical services should also be accelerated. In addition, the severe doctor-patient relationship, drug safety problems and medical paper fraud exposed in recent years show that it is urgent to accelerate the reform of China's medical and health services.

Table-2. The influence of medical security and trust in doctors on subjective well-being (OLS).

Variables	Dependent variable: SWB			
	(1)	(2)	(3)	(4)
Medical security satisfaction	0.066***		0.039***	
	(0.005)		(0.005)	
Trust in doctors		0.080***		0.074***
		(0.017)		(0.016)
Gender			-0.074***	-0.068***
			(0.021)	(0.021)
Age			-0.044***	-0.047***
			(0.006)	(0.006)
Age square			0.000***	0.000***
			(0.000)	(0.000)
Nationality			0.081*	0.062
			(0.047)	(0.047)
Religious belief			0.085***	0.066**
			(0.031)	(0.031)
Political status			0.060*	0.070**
			(0.033)	(0.033)
Household registration type			-0.057**	-0.057**
			(0.024)	(0.024)
Education level			0.005	0.005
			(0.003)	(0.003)
Taking divorce or widowed as reference				
Unmarried			0.059	0.040
			(0.067)	(0.067)
In marriage			0.295***	0.298***
			(0.049)	(0.048)
Absolute income			0.056***	0.059***
			(0.011)	(0.011)
Relative income			-0.192***	-0.199***
			(0.012)	(0.012)
Internet			0.069**	0.061**
			(0.029)	(0.029)
House			0.048	0.051*
			(0.031)	(0.031)
Car ownership			0.099***	0.089***
			(0.024)	(0.024)
Social			0.040***	0.046***
			(0.007)	(0.007)
Entertainment			0.049***	0.051***
			(0.006)	(0.006)
Province	YES	YES	YES	YES
R^2	0.050	0.031	0.172	0.167
N	9875	9990	8784	8879

Note: *, **, and ***represent 10%, 5%, and 1% levels of statistical significance, respectively. Robust standard errors are reported in parentheses.

The quality of medical services is not only related to people's livelihood, but also an important guarantee for Chinese people's well-being. Fortunately, in recent years, the Chinese government has already introduced a series of

medical reform policies, and implemented a "healthy China" development strategy. This study further supports the importance of further promoting active health care reform in China.

In addition, the effects of control variables on subjective well-being are also highly consistent with the expectation. Specifically, the coefficient of gender is significantly negative, indicating that the subjective well-being for men is lower than that of women, which can be explained by the reality that Chinese men are under more pressure because they are mainly responsible for supporting their families. There is a "U-shaped" relationship between age and people's subjective well-being, which may be caused by the fact that middle-aged people need to bear more family and social responsibilities. The subjective well-being of rural residents is lower than that of urban residents. The possible explanation is that compared with urban residents, rural residents have lower income level and higher income instability.

Table-3. The influence of medical security satisfaction and trust in doctors on subjective well-being (ordered probit).

Variables	Dependent variable: SWB			
	(1)	(2)	(3)	(4)
Medical security satisfaction	0.073***		0.047***	
	(0.005)		(0.006)	
Trust in doctors		0.092***		0.091***
		(0.018)		(0.019)
Gender			-0.085***	-0.077***
			(0.024)	(0.024)
Age			-0.051***	-0.054***
			(0.007)	(0.007)
Age square			0.001***	0.001***
			(0.000)	(0.000)
Nationality			0.092*	0.071
			(0.054)	(0.054)
Religious belief			0.112***	0.088**
			(0.037)	(0.036)
Political status			0.089**	0.098**
			(0.040)	(0.040)
Household registration type			-0.069**	-0.068**
			(0.028)	(0.028)
Education level			0.004	0.005
			(0.004)	(0.004)
Taking divorce or widowed as reference				
Unmarried			0.067	0.042
			(0.075)	(0.074)
In marriage			0.314***	0.316***
			(0.053)	(0.052)
Absolute income			0.061***	0.064***
			(0.013)	(0.013)
Relative income			-0.213***	-0.221***
			(0.015)	(0.014)
Internet			0.072**	0.064*
			(0.034)	(0.034)
House			0.056	0.059*
			(0.035)	(0.035)
Car ownership			0.128***	0.115***
			(0.029)	(0.029)
Social			0.050***	0.057***
			(0.008)	(0.008)
Entertainment			0.056***	0.059***
			(0.007)	(0.007)
Province	**YES**	**YES**	**YES**	**YES**
N	9875	9990	8784	8879

Note: *, **, and ***represent 10%, 5%, and 1% levels of statistical significance, respectively. Robust standard errors are reported in parentheses.

In addition, the development imbalance between urban and rural areas is obvious in China. The living and service facilities for rural residents are relatively scarce, and rural residents are generally less educated. The coefficients of religious belief and political status are all positively significant, indicating that residents with religious beliefs and political beliefs are happier. It should be noted that absolute income and relative income have opposite effects on the subjective well-being. Specifically, the increase of absolute income can improve people's subjective well-being, while the lower their relative socio-economic status is, the lower their subjective well-being will be. From the perspective of the effect of marital status on subjective well-being, compared with divorced residents, married people are more likely to feel happy, which is consistent with the relevant research of marriage economics, indicating that marital happiness is an important guarantee of individual's subjective well-being. The coefficient of the Internet is significantly positive, indicating that Internet use has become an important factor affecting individual's subjective well-being. Finally, in terms of social interaction and social capital factors, car ownership, social and entertainment activities can also increase the subjective well-being of Chinese residents.

In order to further identify the effects of medical security satisfaction and trust in doctors on people's subjective well-being in different degrees, this paper further gives the marginal effect results of the medical security satisfaction and trust in doctors on subjective well-being based on the columns (3) and (4) in Table 3. As shown in Table 4, the columns (1)— (5) show that after considering control variables and province dummy variables, 1% increase in medical security satisfaction and trust in doctors, the probability of people feeling very unhappy (SWB=1) decreases by 0.4% and 0.7%, respectively. The probability of people feeling unhappy (SWB=2) falls by 0.6% and 1.1% respectively. In contrast, the probability of residents feeling very happy (SWB=5) increases 1.1% and 2.1%, which further verifies the above research conclusion, namely the continuous improvement of medical security level and doctor-patient relationship are conducive to the increase in residents' subjective well-being.

Table-4. The marginal effect of medical security satisfaction and trust in doctors on subjective well-being.

Variables	Dependent variable: SWB				
	Ordered probit (marginal effect)				
	(1)	(2)	(3)	(4)	(5)
	SWB = 1	SWB = 2	SWB = 3	SWB = 4	SWB = 5
Medical security satisfaction	-0.004***	-0.006***	-0.007***	0.006***	0.011***
	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
Trust in doctors	-0.007***	-0.011***	-0.014***	0.011***	0.021***
	(0.001)	(0.002)	(0.003)	(0.002)	(0.004)
Control variables	YES	YES	YES	YES	YES
Province	YES	YES	YES	YES	YES

Note: *, **, and ***represent 10%, 5%, and 1% levels of statistical significance, respectively. Robust standard errors are reported in parentheses.

4.2. Robust Discussion

To verify the reliability of the above results, this paper further conducts several robust tests as follows: First of all, in the foregoing, both medical security satisfaction and trust in doctors are regarded as continuous variables. Therefore, we further take the two variables as discrete variables, namely taking the "medical security satisfaction=1" and "trust in doctors=1" as the reference, respectively. The estimation results under ordered probit model are shown in the Table 5. Secondly, we also use the ordered logit to estimate the benchmark model, and the estimation results are shown in Table 6. Finally, this article employs other indicators to replace subjective well-being. According to CSS2015, through the two questions "do you often feel burdened and stressed?" and "do you often feel lonely and helpless", we construct two indicators (denoted by life satisfaction and psychological well-being, respectively). Both of the two indicators are five-category variables, namely with 1="very disagree" to

5="very agree". Therefore, the higher the two indicators are, the lower people's life satisfaction or psychological well-being will be. The estimation results are shown in Table 7.

Table-5. Impact of medical security satisfaction and trust in doctors on subjective well-being (robust test).

Variables	Dependent variable: SWB (ordered probit)			
	(1)	(2)	(3)	(4)
Taking "medical security satisfaction =1" as reference				
Medical security satisfaction = 2	0.070		0.059	
	(0.086)		(0.090)	
Medical security satisfaction = 3	0.254***		0.226***	
	(0.077)		(0.081)	
Medical security satisfaction = 4	0.259***		0.220***	
	(0.073)		(0.077)	
Medical security satisfaction = 5	0.359***		0.245***	
	(0.067)		(0.071)	
Medical security satisfaction = 6	0.382***		0.246***	
	(0.067)		(0.071)	
Medical security satisfaction = 7	0.490***		0.304***	
	(0.068)		(0.072)	
Medical security satisfaction = 8	0.626***		0.411***	
	(0.069)		(0.073)	
Medical security satisfaction = 9	0.594***		0.374***	
	(0.081)		(0.086)	
Medical security satisfaction = 10	0.642***		0.490***	
	(0.077)		(0.083)	
Taking "trust in doctors=1" as reference				
Trust in doctors = 2		0.199**		0.087
		(0.081)		(0.085)
Trust in doctors = 3		0.315***		0.196**
		(0.078)		(0.082)
Trust in doctors = 4		0.348***		0.267***
		(0.083)		(0.086)
Control variables	NO	NO	YES	YES
Province	YES	YES	YES	YES
N	9875	9990	8784	8879

Note: *, **, and ***represent 10%, 5%, and 1% levels of statistical significance, respectively. Robust standard errors are reported in parentheses.

From the estimation results of columns (3) and (4) in the Table 5, in general, when taking the "medical security satisfaction=1" as the reference, people with the higher medical security satisfaction would have higher subjective well-being, and when the medical security satisfaction is highest, the subjective well-being level is also the highest. On the other hand, when taking the "trust in doctors =1" as the reference, the coefficients of "trust in doctors" =2, "trust in doctors" =3 and "trust in doctors" =4 are all positive, but it is only significant for the "trust in doctors" =3 (5% level) an "trust in doctors" =4 (1% level). However, in general, this result still supports the conclusion that improving doctor-patient relationship can improve the subjective well-being.

Table-6. Impact of medical security satisfaction and trust in doctors on subjective well-being (robust test).

Variables	Dependent variable: SWB (ordered logit)			
	(1)	(2)	(3)	(4)
Medical security satisfaction	0.135***		0.086***	
	(0.010)		(0.011)	
Trust in doctors		0.172***		0.162***
		(0.031)		(0.034)
Control variables	NO	NO	YES	YES
Province	YES	YES	YES	YES
N	9875	9990	8784	8879

Note: *, **, and ***represent 10%, 5%, and 1% levels of statistical significance, respectively. Robust standard errors are reported in parentheses.

Table-7. Impact of medical security satisfaction and trust in doctors on subjective well-being (robust test).

Variables	Dependent variable							
	Life satisfaction				Psychological well-being			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Medical security satisfaction	-0.062***		-0.036***		-0.050***		-0.030***	
	(0.005)		(0.006)		(0.005)		(0.006)	
Trust in doctors		-0.071***		-0.056***		-0.034*		-0.046**
		(0.017)		(0.019)		(0.017)		(0.019)
Control variables	NO	NO	YES	YES	NO	NO	YES	YES
Province	YES	YES	YES	YES	YES	YES	YES	YES
N	9871	9987	8782	8878	9858	9972	8772	8867

Note: *, **, and ***represent 10%, 5%, and 1% levels of statistical significance, respectively. Robust standard errors are reported in parentheses.

Similarly, as shown in Table 6, the estimation results under ordered logit model are highly consistent with that of the ordered probit model in the Table 3, namely both the medical security satisfaction and trust in doctors have significant positive effects on subjective well-being. Finally, the results in the Table 7 show that coefficients of medical security satisfaction and trust in doctors on both the life satisfaction and the psychological well-being are negatively significant, indicating that improving of medical security and doctor-patient relationship can increase people's life satisfaction and psychological well-being. In general, the above analysis further shows that the main conclusions of this paper are credible.

4.3. Endogenous Discussion

The analysis above shows that the improvement of medical security and doctor-patient relationship can promote people's subjective well-being. However, the higher people's subjective well-being is, the more optimistic they may be in their evaluation of things, which leads to higher satisfaction with medical security and trust in doctors. In addition, people with higher income may have more chances to obtain good medical security and professional medical services, which may lead to "selection bias" for the variables of medical security satisfaction and trust in doctors. As a result, endogenous problems may arise because of the self-selection bias in sample. Therefore, the propensity score matching (PSM) method is used to construct a counterfactual framework of the effects of medical security satisfaction and trust in doctors on people's subjective well-being. Specifically, above all, this paper redefines medical security satisfaction and trust in doctors as binary variables (denoted by medical security satisfaction$_1$ and trust in doctors$_1$), namely when medical security satisfaction is greater than 5, the value of medical security satisfaction$_1$ is 1, and when it is less than or equal to 5, the value is 0. The value of trust in doctors$_1$ is 1 when the value of trust in doctors is greater than 2, and 0 when the value is less than or equal to 2.

Generally speaking, before using the PSM method, we need to ensure that there are no no systematic differences between the control group and the treatment group samples. Taking the balance test under 2-nearest neighbor matching method as an example, the results show that before matching, in addition to gender, religious belief, absolute income, marital status and car ownership, other control variables have obvious systematic differences (significant at the 1% level). After matching, the standardized bias (%bias) of all variables are less than 10%, and the t-test results of all variables (except nationality) cannot reject the null hypothesis that there is no systematic difference between the treatment group and the control group. Therefore, the PSM passes the balance test.

Based on the PSM method, Table 8 shows the average treatment effect on the treated (ATT) by four matching methods, i.e., radius matching, local linear matching, kernel matching and 2- nearest neighbor matching. The results show that the ATT is significantly positive under different matching methods. Although the ATT values and significance obtained by different matching methods are slightly different, the results all support that the improvement of medical security and the doctor-patient relationship have a significant positive impact on residents'

subjective well-being. To sum up, after using the propensity score matching method to correct the problem of selective bias, it is still concluded that improving medical security level and doctor-patient relationship have a significant positive impact on residents' subjective well-being.

Table-8. The estimation results for PSM.

Matching method	Radius matching	Local linear matching	Kernel matching	2 nearest neighbor matching
	Taking medical security satisfaction as the treatment variable			
ATT	0.125***	0.119***	0.126***	0.109***
	(0.025)	(0.032)	(0.025)	(0.029)
Control variables	YES	YES	YES	YES
Province	YES	YES	YES	YES
Number of treatment group	5346	5346	5346	5346
Number of control group	3438	3438	3438	3438
	Taking trust in doctors as the treatment variable			
ATT	0.093***	0.086**	0.105***	0.087**
	(0.032)	(0.039)	(0.031)	(0.036)
Other variables	YES	YES	YES	YES
Province	YES	YES	YES	YES
Number of treatment group	7171	7171	7171	7171
Number of control group	1708	1708	1708	1708

Note: *, **, and ***represent 10%, 5%, and 1% levels of statistical significance, respectively. Standard errors are reported in parentheses.

5. CONCLUSIONS AND DISCUSSIONS

In this paper, the impact of individual's medical security satisfaction and trust in doctors (to reflect doctor-patient relationship) on people's subjective well-being is systematically studied for the first time using the data from China Social Survey (CSS) for 2015. In the benchmark model, we control various factors that may affect subjective well-being, including social and demographic characteristics, income factors, technical factors, family assets, social capital factors and provincial fixed effect. The results show that both medical security satisfaction and trust in doctors have a significantly positive relationship with subjective well-being, namely improving medical security and doctor-patient relationship can contribute to subjective well-being. In addition, we have adopted multiple methods for robust test, and dealt with the endogenous problems by using the propensity score matching method. The results still support the original conclusion.

In recent years, The State Council of the PRC and local governments in China have attached great importance to the improvement of medical and health services. China's General Secretary, Xi Jinping, stressed that "people's healthy development is a strategic priority" at the 19th National Congress of the Communist Party of China (NCCPC). This study further confirms the important practical significance of promoting the "healthy China" strategy. With the transformation of China's economic development model, people's pursuit of health and quality of life is becoming more and more intense. Improving the doctor-patient relationship and the level of medical services can not only alleviate the challenges for the sustainable development of China's economy posed by the population aging, but also become an important source of improving the well-being and welfare level in the new era. The research in this paper further supports the importance of the series of health-related policies adopted by China in recent years. The following policy implications are obtained in combination with the research conclusions of this paper.

Firstly, China should further deepen the reformation of medical and health services to establish a complete mechanism for handling medical disputes. On the one hand, China should strengthen the construction of health infrastructure and do a good job in preventing major diseases. Authoritiess should establish a thorough mechanism to ensure the safe and legal supply of drugs, and crack down on illegal and criminal medical activities. On the other

hand, the Chinese government should accelerate the exploration of strategies to prevent medical disputes and new mechanisms to improve the doctor-patient relationship, and follow the law to establish a clear accountability mechanism for medical disputes. At the same time, the government can establish a sound doctor-patient communication system, strengthen professional ethics training for medical professionals and train high-level medical professionals. Governments can make full use of the Internet, artificial intelligence and other new technologies to guide doctor-patient relations toward a harmonious direction

Secondly, despite the great progress made in China's medical reform compared with the past, China still faces an obvious imbalance in the distribution of medical resources between urban and rural areas. The unbalanced development between urban and rural areas in China has a direct impact on the rights and opportunities of urban and rural residents to enjoy equal access to medical resources. For a long time, medical resources in rural areas and remote areas have been severely lacking, and the "difficulty in getting medical services" remains an important obstacle to the improvement of rural residents' health. Therefore, the structural allocation of medical resources should be further improved in China. Meanwhile, modern information and communication technologies can also be used to promote the construction of "Internet + medical treatment" (e.g., telemedicine) and promote the equal enjoyment of medical resource benefits by urban and rural residents.

Finally, in recent years, the trend of population aging in China is obvious. In order to meet this social change, the Chinese government should increase policies to encourage the development of healthy industries, and popularize health knowledge in a comprehensive way, e.g., exploring new ways to develop the healthy food industry, health care industry, healthy endowment industry and healthy sports industry, etc.

Although this paper further enriches the relevant research on health economics, there are still severals limitations that need to be further analyzed in the future. Above all, due to the limitation of data, this paper only uses the cross-sectional data for one year. Although we try to control for various factors that may affect SWB, it may still miss some unobservable factors that affect both SWB, medical security satisfaction and trust in doctors. Therefore, it is very necessary to study this problem by selecting panel data in the future. Moreover, the selection of appropriate instrumental variables will also be a further extension of this research. In addition, this paper only examines the effect of medical security satisfaction and trust in doctors on subjective well-being. As discussed above, health care has both direct and indirect effects on the subjective well-being. Therefore, the mechanism of their influence on subjective well-being can be further analyzed in the future.

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