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The Role of Medical Insurance in the Chinese Elders' Behaviors of Smoking and Quit Smoking

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Abstract: PURPOSE: In the midst of rapid ageing population and rising medical cost, smoking cessation policy is more emphasized by the governments in China than ever. They have taken a public health approach to reform their medical care system, in which policy under an innovative public health reform process is hammered out to reduce the impact of ageing population and rising prevalence rates of chronic diseases on medical expenditure. However, there are very limited studies on the relationship between China's medical care system and elderly smoking behaviors. DESIGN/METHODOLOGY/APPROACH: The study adopts national elderly data, namely the China Health and Retirement Longitudinal Study (CHARLS), to investigate into the relationship between medical care system and elderly smoking behaviors with control variables, including socio-economic background, disability status and chronic diseases. FINDINGS: According to the results of logistics regression model, there is no significant relationship between smoking behavior and the medical insurance for urban residents and urban employees, whereas new rural cooperative medical insurance is positively correlated to the likelihood of smoking and negatively correlated to the likelihood to quit smoking among the elderly population. Besides, aged above 75, having chronic diseases and visual disability increase the likelihood to quit smoking, but no formal education and hearing disability decrease the likelihood to quit smoking. Aged above 75 and married lower the likelihood of smoking, but male, having hearing disability and respiratory disease enhance the likelihood of smoking. ORIGINALITY/VALUE: China's medical care system has not yet fully utilized its role in public health approach and the governments may modify their smoking cessation policies and practices to become preventive rather than reactive by taking reference to the findings of this paper.

Key words: Ageing population, medical care system, medical insurance, tobacco smoking, behavior of smoking cessation.

1. Introduction

On June 1, 2015, Beijing announced a so-called "the most stringent" policy designed to forbid smoking indoor [1]. Since China is one of the biggest Tobacco producers in the world, its anti-smoking policy might always face a lot of resistance [2]. The new policy implementation in Beijing is a significant milestone in the history of China's anti-smoking control. It shows the government's determination to accelerate the medical care reform process [3].

There are some reasons behind this. On the one hand, China is faced with serious problems of ageing population. So far the number of people in China aged above 60 has exceeded 200 million, accounting for 14.9% of the total population [4]. This is much higher than the 10 percent, defined by the United Nations as an ageing society [5]. According to this criterion, China has entered the ageing society since 1999. The China National Committee on Ageing predicts that China will experience rapid ageing of its population during the period from 2001 to 2020, and the percentage of the elderly aged above 65 in the total population will increase from 7% to 14% [6]. Developed countries spend more than 45 years to

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become an ageing society, whereas China only uses 27 years. A rapidly ageing population can have a negative impact both on demographic dividend and socio-economic development. On the other hand, the elderly are more likely to be vulnerable to chronic diseases. In 2012, there are about 260 million patients in the country diagnosed with chronic diseases. Particularly due to China's ageing population, the number of patients with chronic diseases is rapidly increasing. Because of the long course of chronic diseases and high medical expenses, the number of patients dying from smoking-related diseases amounts to 85% of the total death in China, and the medical expenses for smoking-related diseases occupy 70% of the total medical expenses [7]. In addition, the percentage of the physically disabled elderly is much higher than that from other age groups. As China's ageing population continues to increase, chronic diseases and physical disabilities will bring more challenges to its medical care system and economic development.

Previous research shows that the behavior of smoking cessation is the greatest factor to control and prevent chronic diseases [8]. The smoking rate of the Chinese elderly is rather high, which seriously affects their health conditions and the whole population's quality. As China is faced with a rapidly ageing society, it is necessary to examine factors affecting the Chinese elderly people's behaviors of smoking and smoking cessation. It is hoped that this study can examine China's tobacco-control policy and find out the factors affecting the Chinese elderly people's behavior of smoking cessation. among other factors associated with the success of the anti-smoking control, the government seeks to facilitate the implementation by other means. In addition to the relaxation of the one child policy, the establishment of a healthy society, the reform of the present medical care system, and the perfection of social security system are necessary conditions to ensure China's transition to super-aging stage and to deal with the liabilities of its population [9].

Some studies show that it is higher likelihood for persons with no medical insurance to have smoking behavior [10]. However, some studies find that, because of ex-ante moral hazard, medical insurance increases the propensity to heavy smoking [11]. Later, Jerant and his research team explain that ex-ante moral hazard means lower the personal cost of unhealthy behavior leading to higher medical services utilization but ex-post moral hazard describes higher health care utilization leading to higher the utilization of preventive care [12]. Preventive cares, like smoking-cessation clinic, have already caught public's attention, Xiao's research team demands for public medical insurance to cover smoking cessation medication for helping Chinese smokers to quit smoking [13]. Recently, the Central Government of China makes concerted efforts to promote the coverage of public medical insurance, and the coverage of the three popular public medical insurance reached above 90% in 2011 [14]. It is high time to examine whether China's public medical insurances coordinate with smoking cessation policy to control the rising medical costs.

This study aims to explore the impact of four factors, i.e. socio-economic factors, Chinese elderly people's chronic diseases, their physical disabilities and medical insurance, on Chinese elderly people's behavior of smoking and smoking cessation.

2. Research Background

Elderly population always has a higher prevalence rate of chronic diseases and higher utilization rate of medical services than others. It is found that tobacco smoking is a leading factor of chronic diseases. Expectedly, one of effective methods to lower the burden of medical cost of elderly population is to reduce the prevalence rates of tobacco smoking among the elderly.

2.1 China's Policy on the Control of Chronic Diseases of the Aged Population

According to the National Program for Chronic

Disease Control and Prevention (2012-2015), China will build more community centers to promote healthy life styles, examine the conditions of chronic diseases in the community, carry out surveys and diagnostic tests in the community to identify the main health problems and risk factors, strengthen the concept of public health in the whole society, promote the concept of a "healthy ageing society", increase the life quality of the elderly, prevent the occurrence of chronic diseases, and reduce risk factors of chronic diseases [7]. All these efforts are aimed at gradually building a healthy society. At present, major factors causing chronic diseases such as heart diseases, cancers, and diabetes, include unhealthy diet, the lack of physical exercises, and the use of tobacco [15]. To deal with these challenges, some measures recommended by scholars include the utilization of primary care [16] and reform the medical insurance system [17]. It is believed that the public health approach and medical health insurance can minimize the impacts of factors causing chronic diseases.

2.2 The Situation of Tobacco Control in China

Smoking is a preventable risk behavior in chronic diseases. Even though China is the largest tobacco producer, China started to implement the content of WHO Framework Convention on Tobacco Control (FCTC) in 2006 and the government made quite some effort to avoid people being exposed to secondhand smoke [18]. In 2008, the Olympic Games were held in Beijing, China. At that time, China's smokers could smoke everywhere (including indoors) without realizing that how smoking can be harmful to their health as well as the health of their families and friends. In that year, the Chinese government started to promote the "tobacco-free Olympic Game" campaign and drew the public's attention to its anti-smoking policy [19].

China's next major measures in its tobacco-control plan is the implementation of banning tobacco in public places, which has been included into China's 12th Five-Year Plan, National Program for Chronic Disease Control and Prevention (2012-2015), and China's Tobacco Control Plan (2012-2015). In addition, in April 2007, the State Council approved the establishment of the inter-ministerial coordination group for the implementation of the Framework Convention of Tobacco Control. This group consists of the Ministry of Industry and Information Technology, the Ministry of Health, the Ministry of Foreign Affairs, the Ministry of Finance, the General Administration of Customs, the State Administration for Industry and Commerce, the General Administration of Quality Supervision, Inspection and Quarantine, and China Tobacco. This inter-ministerial coordinating mechanism becomes more important than ever to implement smoking cessation policy. They resort to raising tobacco taxes, regulating tobacco packaging and label, and banning tobacco advertising [20].

Following the move of the central government, China's local governments are quickening their steps of the tobacco-control legislation. After Shanghai, Hangzhou, and Guangzhou, Harbin and Tianjin completed their tobacco-control legislation in 2012. Karamay, Anshan, Qingdao, Tangshan, Lanzhou, Shenzhen, and more other cities made tobacco-control regulations in 2013. among these cities, the tobacco-control legislations in Harbin, Anshan, Qingdao, and Shenzhen have met the requirements of the Framework Convention on Tobacco Control. Take Qingdao for example, its tobacco-control regulations cover the domains of education, medical care, recreation and entertainment, transportation, and other legally forbidden places. Regulations are not limited to the urban area and there are no buffer areas or transitional periods. In addition, some cities such as Changchun and Beijing are entering or have entered the legislative procedures [21]. Some scholars proposed that local government can play an important role to change the social norms of tobacco use, including enacting more stringent anti-smoking regulation and encouraging citizens to quit smoking [22].

2.3 China's Medical Care System and Its Three Kinds of Medical Insurance

China's reform of the medical care system started in 1979 [23], and the process has taken for years without success. In 1992, China changed to implement the marketization of medical care but various problems occurred, such as the declining medical ethics, the over-prescription, the over-use of new equipment, the illegal charges, the drug rebate between hospitals and drug companies, the red bags between medical workers and patients, fake advertisements, wrong diagnoses, medical accidents [24]. In order to solve the problems of expensive medical bills and difficult access to medical care, China has chosen to implement its latest medical care system reform, moving gradually towards national medical insurance [25].

At present, China's basic medical insurance systems include Urban Employee Basic Medical Scheme, Urban Resident Basic Medical Scheme, and New Cooperative Medical Scheme. Urban Employee Basic Medical Scheme is targeted at all urban employees and is compulsory. Urban Resident Basic Medical Scheme is targeted at urban non-employed and is voluntary. It mainly takes care of the comprehensive arrangement of serious diseases. New Cooperative Medical Scheme is targeted at rural residents and is funded mainly by the government [26]. It emphasizes the principle of voluntary participation and rural residents' rights to know, participate, and supervise the operation of the medical insurance [27]. While the elderly with Urban Employee Basic Medical Scheme or Urban Resident Basic Medical Scheme are more likely to use outpatient services, the elderly with New Cooperative Medical Scheme are less likely to have outpatient services [28].

In order to prevent from medically induced poverty [29], the Central Government of China introduced heavy government subsidies for medical insurance, i.e. 75% and 85% of New Cooperative Medical Scheme and Urban Resident Basic Medical Scheme, to promote the coverage of the three national medical insurances from 50% in 2005 to more than 90% in 2011 [14]. The inpatient and outpatient reimbursement rates of Urban Employee Basic Medical Scheme (inpatient service: 68%; outpatient service: 100%) are higher than that of Urban Resident Basic Medical Scheme (inpatient service: 48%; general outpatient service: 58%; outpatient service for major and chronic diseases: 83%) and New Cooperative Medical Scheme (inpatient service: 44%; general outpatient service: 79%; outpatient service for major and chronic diseases: 89%) in 2011 [14]. Urban Employee Basic Medical Scheme and Urban Resident Basic Medical Scheme are managed by Ministry of Human Resource and Social Security; whereas, New Cooperative Medical Scheme is managed by National Health and Family Planning Commission [30]. As a result, the three national medical insurances have different management organization, reimbursement rates, health service coverage and contribution methods.

The difference in the arrangement of medical insurance systems leads to the different patterns of medical services utilization and different smoking behavior. It is high time to explore the role of medical insurance in Chinese elderly people's behaviors of smoking and quit smoking.

3. Literature Review

3.1 Factors of Smoking Behaviors

Previous studies on tobacco use in many cities of China (including Guangzhou [31], Beijing, Shanghai, Tianjin, Shenzhen, Changsha [32], etc.) show that the rate of smoking among males is much higher than that among females [33]. Among the Chinese adults, the rate of smoking is the highest among those aged between 50 and 54 [33]. Among people with different educational levels, those with secondary education smoke the most, followed by those with primary and tertiary education [31]. Findings from other studies suggest that the lower a person's educational level is, the higher his or her rate of smoking is [34]. These contradictory findings make it difficult to conclude from the literature whether education background

matters or not, and thus it becomes an independent variable to be tested again in this paper hereinafter.

Previous studies also show that people, who are married, receive a higher level of education, retire early, get a medium-level income, and are aged above 64, tend to quit smoking [35]. The main reasons for males to quit smoking are their intentions to keep fit and their family members' encouragement to quit smoking [36]. Some studies find that being married or living together could be a reason of smoking cessation [37]. But other studies show that being married, divorced, separated, and widowed could be a negative factor of smoking cessation [38]. Also, some researches find that social support could be associated with smoking prevalence and smoking cessation [39]. These contradictory findings also require the marital status be tested again in this paper.

Health consideration could be the other major motivation for the elderly to quit smoking. A large-scale community survey in the 1990s shows that health concerns are main reasons for the elderly to quit smoking, and their recent experience of hospitalization and initial heart attack are significant predictors [40]. Some studies show that although there is a decreasing tendency among smokers aged above 45, people who quit smoking are small in number and the success rate of smoking cessation is rather low. The main reason for the smokers to quit smoking is being forced to quit smoking because of diseases [41] and hospitalization. In addition, being elderly and having spouses positively correlate with smoking cessation [39], and the support from spouses, children, and grand-children also helps the elders quit smoking [38]. This finding is contradictory again to the other finding [38] and therefore a re-examination is required.

As for the relationship between disabilities and the behaviors of smoking and smoking cessation, some studies find that people with a disability were less likely to have attempted to quit smoking and suggest that interventions for cessation need to be matched according to their disability characteristics [39]. Some studies find that people do not know much about the risks of blindness due to smoking; however, once they know the relationship between smoking and the risks of blindness, they are more likely to quit smoking [42]. Compared with risks to contract chronic diseases such as lung cancers, heart diseases, and strokes, people's concerns for blindness are a more convincing motivation for them to quit smoking. Some scholars suggest that more efforts should be made to strengthen the publicity of the relationship between smoking and optical diseases in order to lower the rate of smoking [43].

In addition, the rate of smoking is also affected by disabilities. It is more likely that patients with chronic diseases are ex-smokers and have quitted smoking [44]. It is also more likely that the disabled adults are in need of others' help to plan smoking cessation [45]. Some studies find that if medical workers persuade the elders, especially those with disabilities or chronic diseases to quit smoking, the results are more prominent [46].

On the other hand, studies show that the elders are more likely to quit smoking [47]. Recent research on the behaviors of smoking and smoking cessation mainly focuses on the young people, leading to the neglect of the elders. In fact, there are many advantages for the elderly to quit smoking, such as the extension of life [38], the improvement of life quality [48], and the reduction of risks of contracting chronic diseases [49].

3.2 Public Health Approach to Smoking Cessation

As Winslow (1923) and the Acheson Report (1988) defined, "public health is the art and science that talks about preventing disease, prolonging life, and promoting physical health and efficiency through organized community efforts for the sanitation of the environment" [50]. As Mary-Jane Schneider (2011) mentioned, there are four steps of established public health approach: (1) Define the health problem. (2) Identify risk factors associated with the problem. (3) Develop and test community-level interventions to control or prevent the cause or the problem. Implement

interventions to improve the health of the population. (4) Monitor those interventions to assess their effectiveness [51].

The public health approach suggested by World Health Organization to smoking cessation is to seek the change of social climate and to promote a supportive environment to prevent and quit smoking, and to create a supportive environment that can encourage people cessation like smoke-free policies. Besides, it has to integrate the health-care systems to ensure the effectiveness of cessation services. In doing so, the primary health care system should provide advice and tips to smokers on routine health education. Similarly, both local and national health professionals and experts can provide the knowledge to the smokers and motivate them. A supportive smoking cessation environment can be created by general population-based measures to encourage smokers to quit. Also, the institutional, financial resources and advertisement support from the government are very important to the population- and individual-based tobacco cessation interventions [52].

3.3 Medical Insurance and Smoking Behaviors

Tobacco consumption brings large economic loss, including productivity losses, medical expenditure, to family and countries [53]. Though smokers may be willing to pay more for the cure of Chronic Obstructive Pulmonary Disease [54], their willingness to pay more for social insurance arrangement violates the social justice principles of equity. In the US, the Affordable Care Act allows premiums of small-group policies to vary on tobacco use, but regulators permit this adjustment in connection with wellness program, or require the insurance company to allow tobacco users to reduce their premiums to the level of non-tobacco users by participating in a tobacco cessation program or similar program [55]. Some scholars show that full health insurance coverage for smoking cessation treatment leads to a significant increase in the number of prescriptions of stop-smoking medication and a decrease in smoking prevalence [56]. According to the concerns of information asymmetry, the incentive arrangement of medical insurance shift from providers to clients and the typical example of the arrangement is Pay for Performance for Patients. Pay for Performance for Patients, to provide employees incentive to quit smoking, becomes an option for large corporations' group insurances [57]. It is a trend for the government to integrate medical insurance and quit smoking program together to curb the negative impacts of tobacco consumptions on the burden of medical expenditure and economic loss.

4. Research Methods

Data of this study come from the China Health and Retirement Longitudinal Study (CHARLS), a research centre of the Peking University. The CHARLS aims to collect high-quality data on families and individuals aged above 45 to analyze China's ageing problems and promote inter-disciplinary research on ageing problems. Based on a nationwide random sampling, the CHARLS samples 10,000 households from 150 cities, towns and villages. Finally 17,000 people participated in the questionnaire survey. The design of questionnaires takes into consideration of international practices, including the Health and Retirement Study (HRS), English Longitudinal Study of Ageing (ELSA), the Survey of Health, Ageing and Retirement in Europe (SHARE), etc. The data are large in scale, with a high degree of representativeness. In addition, sample is collected every two years, thus making the data highly significant for academic research. This study focuses on those above 65 years old [58]. The sample size for smoking behavior study and smoking cessation behavior study are 4,580 and 1,933 respectively.

This study mainly employs Binary Logistic Regression Analysis. Dependent variables include "having the smoking behavior in the past" and "having quitted smoking", both with "yes" and "no" (reference value). Independent variables include four aspects: (1) socio-economic background (including age, gender,

marital status, educational level); (2) disability status (including physical, visual, and audio conditions), chronic diseases (including high blood pressure, blood lipid, blood sugar, respiratory diseases, heart diseases, and digestive diseases), and subjects receiving medical insurance (including Urban Employee Basic Medical Scheme, Urban Resident Basic Medical Scheme, and New Cooperative Medical Scheme).

5. Results

5.1 Data Description and Bivariate Analysis

According to Table 1, 42% of the subjects have the smoking behavior in the past, among whom 29% have quitted smoking. In other words, 30% and 12% of the subjects are present smokers and ex-smokers respectively. Results of bivariate analysis show that for the smoking behavior, all socio-economic factors are significant factors. Hearing disabilities increase the chances of smoking. Except heart diseases, all chronic diseases are significant factors, but subjects with respiratory diseases have a higher chance of smoking. Urban residents with the medical insurance have a lower chance of smoking. For the behavior of smoking cessation, subjects aged above 75 have a higher chance of smoking cessation whereas those not receiving formal education have a lower chance of smoking cessation. All chronic diseases increase chances of smoking cessation. Urban residents and employees with the medical insurance have a higher chance of smoking cessation, whereas residents with new rural cooperative medical insurance may have a lower chance of smoking cessation.

5.2 Smoking behavior

According to Table 2, on the socio-economic aspects, male subjects smoke more than females. Subjects aged above 75 years old smoke less than those below 75. Such results may have to do with the elderly people's

Table 1 Descriptive analysis of behaviors of smoking and smoking cessation.

	Smoking behavior			Behavior of smoking cessation		
	n	mean (%)	*p*-value	*n*	mean (%)	*p*-value
Total	4,580	42.2%		1,933	29.3%	
Socio-economic background						
≥ 75	1,468	38.6%	0.001	567	34.4%	0.002
male	2,287	71.2%	< 0.001	1,628	29.2%	0.833
married	3,138	45.9%	< 0.001	1,439	29.9%	0.366
primary education	1,765	52.1%	< 0.001	919	29.4%	0.983
no formal schooling	2,004	30.3%	< 0.001	608	24.8%	0.003
Disability status						
physical	235	45.5%	0.289	107	34.6%	0.220
visual	473	40.2%	0.344	190	34.7%	0.085
audio	844	45.6%	0.026	385	26.0%	0.106
Chronic diseases						
high blood pressure	1,553	37.2%	< 0.001	578	36.7%	< 0.001
blood lipid	440	35.5%	0.003	156	49.4%	< 0.001
blood sugar	310	33.9%	0.002	105	46.7%	< 0.001
respiratory diseases	702	57.0%	< 0.001	400	39.3%	< 0.001
heart diseases	761	40.2%	0.222	306	42.2%	< 0.001
digestive diseases	947	41.6%	< 0.001	68	44.1%	< 0.001
Subjects receiving medical insurance						
Urban Resident Basic Medical Scheme	209	32.5%	0.004	68	44.1%	0.006
Urban Employee Basic Medical Scheme	563	44.9%	0.168	253	40.7%	< 0.001
New Cooperative Medical Scheme	3,165	43.0%	0.107	1,362	25.3%	< 0.001

Table 2 Results of Binary Logistic Regression Analysis on the behaviors of smoking and smoking cessation.

	Smoking behavior				The behavior of quit smoking			
	B	S.E.	O.R.	*p*-value	B	S.E.	O.R.	*p*-value
Socio-economic background								
≥ 75	-0.235	0.086	0.791	0.007	0.452	0.118	1.572	< 0.001
male	2.840	0.088	17.114	< 0.001	-0.053	0.153	0.948	0.729
married	-0.212	0.089	0.809	0.017	0.068	0.127	1.070	0.591
primary education	0.141	0.109	1.151	0.195	-0.125	0.141	0.882	0.373
no formal schooling	0.050	0.123	1.051	0.683	-0.349	0.168	0.705	0.038
Disability status								
physical	-0.033	0.169	0.968	0.846	0.180	0.220	1.197	0.415
visual	0.024	0.130	1.024	0.853	0.389	0.174	1.475	0.025
audio	0.202	0.102	1.224	0.048	-0.366	0.142	0.694	0.010
Chronic diseases								
high blood pressure	-0.133	0.083	0.875	0.109	0.288	0.115	1.334	0.012
blood lipid	-0.081	0.137	0.922	0.554	0.662	0.184	1.939	< 0.001
blood sugar	-0.282	0.157	0.754	0.072	0.394	0.220	1.482	0.073
respiratory diseases	0.657	0.105	1.928	< 0.001	0.514	0.123	1.672	< 0.001
heart diseases	0.087	0.106	1.091	0.414	0.373	0.139	1.452	0.007
digestive diseases	0.010	0.094	1.011	0.912	0.276	0.127	1.318	0.030
Subjects receiving medical insurance								
The medical insurance for urban residents	0.018	0.207	1.019	0.929	0.270	0.285	1.309	0.345
The medical insurance for urban employees	0.001	0.143	1.001	0.995	0.111	0.191	1.117	0.562
New rural cooperative medical insurance	0.303	0.111	1.354	0.006	-0.311	0.151	0.733	0.040
Nagelkerke R^2	0.434				0.096			
Sensitivity	84.224				56.184			
Specificity	75.133				66.642			

health conditions. Similarly, married people smoke less than unmarried. Such results may have to do with married people's family considerations. Finally, the educational level does not make a difference on smoking, and this result is different from some studies [31]. On the aspect of disability status, the deaf smoke more than others. Such results are consistent with findings of some foreign studies which find that the more people (especially the elderly) smoke, the more damage to their hearing abilities [34].

On the aspect of chronic diseases, subjects with respiratory diseases smoke more than those with heart diseases and smoking is one of the causes of respiratory diseases. Subjects receiving New Cooperative Medical Scheme have a higher chance of smoking. Contrasted with urban residents, more rural residents smoke, which may have to do with the latter's voluntary participation in the new rural cooperative medical insurance.

5.3 The Behavior of Quit Smoking

On the aspects of socio-economic background, more elderly aged above 75 quit smoking than those below 75. Such results are in line with the above findings on the smoking behavior of the elderly and may have to do with their health conditions. More elderly people realize that smoking causes various diseases. The elderly with no formal schooling quit smoking less significantly than those with schooling. Such results suggest that education may affect people's ability to receive the outside information and people with no formal schooling are not willing to quit smoking. On the aspects of disability status, the deaf are less likely to quit smoking. Such results are in line with those of their smoking behavior. The blind are more likely to quit smoking.

On the aspects of chronic diseases, subjects with high blood pressure, high blood lipid, heart diseases, and respiratory diseases are more likely to quit smoking than those without such diseases, because they may result from smoking and patients need to quit smoking to avoid the deterioration of their health conditions.

The results also show that subjects receiving New Cooperative Medical Scheme are less likely to quit smoking. One possible reason is adverse selection that new rural cooperative medical insurance is based on voluntary participation and heavy subsidized by the government, so those rural residents with worse health conditions, probably caused by smoking behaviors, are more likely to participate in the medical insurance than those with better health conditions [60]. Another possible reason is ex-post moral hazard that at present outpatient services and drugs for smoking cessation are not included in the scope of the medical insurance and new rural cooperative medical insurance cannot make sure that the elderly have sufficient funds to purchase the service of smoking cessation [12]. In addition, the rural elderly have a rather low level of education and cannot easily accept the view that smoking does harm to health [61]. However, no matter in the urban or rural areas, smoking does more harm to the health of low-income people than to that of high-income people. Such findings are consistent with results from other countries which find that smoking does more harm to the health of people with lower socio-economic status. In China, the economic differences between urban and rural areas are still great and there is a large low-income population in rural areas. At the same time, smoking does the greatest harm to their health. Therefore, more attention should be paid to this group of people [62].

6. Discussion

As can be seen from the above results, at present the majority of the elderly who smoke are males. This may have to do with the society's negative attitudes towards females' smoking behavior. Married people may care about their health conditions under the influence of their family members; therefore, their smoking rate is relatively low. In contrast, because smoking can serve as a tool to reduce pressure, unmarried elderly who live alone for a long period of time and lack family care have a higher rate of smoking. The society should encourage unmarried people to participate in community activities so that they can find sustenance in life and reduce pressure. China's three medical insurance systems do not have significant effects on smoking, which may have to do with the fact that the medical treatment of smoking cessation is only included in limited areas' medical insurance reimbursement list.

On the other hand, the elderly with a long history of smoking (an average of 30 years) are more inclined to keep smoking; therefore, they need instructions of drugs on smoking cessation. The way to encourage the elderly to quit smoking is quite different for the adolescents. For example, when the elderly suffer from chronic diseases especially respiratory problems, they would become more self-motivated to quit smoking. Doctors can encourage the elderly to quit smoking to cure their diseases, because the elderly with chronic diseases need to receive medical treatment for a long period of time and revisit doctors several times. While the medical insurance for urban residents can help the elderly quit smoking, the rural medical insurance system does not produce significant effects on smoking cessation among the elderly in villages. Such results may have to do with the less attention paid to the rural medical system.

Based on the above results, the following concerns and suggestions are raised. At present both China's medical care system and people neglect the concept of prevention. Many of them do not see the doctor until they are very sick. In addition, many incorrect views on smoking prevail even today. For example, many Chinese people believe that some former Chinese leaders who smoke heavily can live into their 90s.

However, long life does not necessarily mean healthy life, and the limited number of cases does not scientifically represent the total population. China's medical care system needs to pay more attention to the role of public sanitation system and strengthen the publicity on the concept of prevention. After ten-year reform of China's medical care system, the three systems (i.e., the medical insurance for urban employees, the medical insurance for urban residents, and new rural cooperative medical insurance) have been established, but the reform emphasizes the treatment of diseases rather than their prevention. The medical insurance only facilitates people's access to medical care but lacks support in smoking cessation (e.g., counseling and smoking cessation drugs). Only some provinces or areas (e.g., Shenyang) include the treatment of smoking cessation into the list of medical insurance reimbursement [1].

This statistical study of the impact of China's medical care system on the behavior of smoking and smoking cessation has revealed that the philosophy of the policy remains very traditional and conservative. Although the three programs resorting to medical insurance have tried hard to promote a healthier society, they do not work well so far as the concept of prevention is concerned. As Angus Dawson puts it [63], "*Prima facie*, insurance looks preventive. It is a decision made *ex ante* in response to an uncertain future that introduces a degree of control. Ultimately, however, this potential is not realized as the kind of control insurance introduces does not allow for prevention but only *ex ante* agreement about the *ex post* compulsory response that should take place if the undesirable event comes to pass. The control it offers is not control over the desirable events, but rather control over its consequences." Therefore, China's medical care system has not yet fully utilized its role as a preventer of disease through smoking cessation policy in public health approach. That is exactly to say, the traditional approach of the China's medical care system needs to be modified in terms of, for example, identity, psychological status and emotional response to social status, age, gender, self-health condition and more other personal aspects of the smokers, of which many unrecognized, latent or unseen factors were not considered (enough) by the governments over the years. They may then modify their smoking cessation policies and practices to become preventive rather than reactive by taking reference to the findings of this paper.

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