

Research Article

Cross-Level Impact of Macro Social Capital on Workers' Health: The Mediating Role of Workers' Status and the Regulating Role of Medical Security System

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Based on the definition of macro social capital in the field of health, this paper explores the impact of macro social capital on laborers' health, the intermediary role of laborers' status, and the regulatory role of medical security system by using the data of China Labor Force Dynamic Survey (CLDS) in 2016 and hierarchical linear model (HLM). The results show that improving the level of regional economic development and increasing the government total investment in health are helpful to improve the health of local people and further verify that improving personal health depends more on the government health expenditure than on private health expenditure. At the same time, the empirical results show that only the subjective well-being of laborers and the satisfaction of family economic status partially mediate the promotion of macro social capital on health; although macro social capital helps to improve individual health, its influence is declining with the improvement of the type of health insurance. When making policies, we should focus on strengthening the improvement of the overall health level of the society, rather than investing more human and material resources in some special groups. In the future, the government should further increase the government's expenditure on public health, build a livelihood network of basic medical insurance, and promote the health of workers.

1. Introduction

The labor force population, namely, the working-age population, is the data of labor force owned by a country or region at a certain time or period. By the end of 2020, China's working population aged 16–59 was 896.4 million, accounting for 64% of China's total population according to China Statistic Almanac. As a kind of ability or resource, the health of labor force population not only enables people to acquire skills and education, to realize their life goals, but also enables individuals to perform their normal roles and characters in the social system, to promote the normal play of social functions and the ultimate harmony of the society. Therefore, the health of the labor force bears the dual responsibility of the society and the individual and needs the common attention of the country, the society, and the individual. At present, there are still gaps in health caused by social determinants such as living environment and access to medical services in different countries or different regions of

the same country, and there are great differences in life expectancy in different regions. In China alone, the biggest difference in life expectancy between provinces was nearly 12 years in 2018 (see Figure 1).

In recent years the World Health Organization has paid attention to the thinking of health and social development, and in 2005 the World Health Organization established Commission on Social Determinants of Health, dedicating to the study of the social factors that affect the national health, in which the macro economic and social policy and health policy are viewed as social structural influence factors, and social psychological and behavioral factors are regarded as daily living environmental factors that affect health status. The international community and countries have paid more attention to the relationship between social conditions and health problems. Countries have paid more attention to the fairness of starting point of health through the establishment and adjustment of medical insurance system.

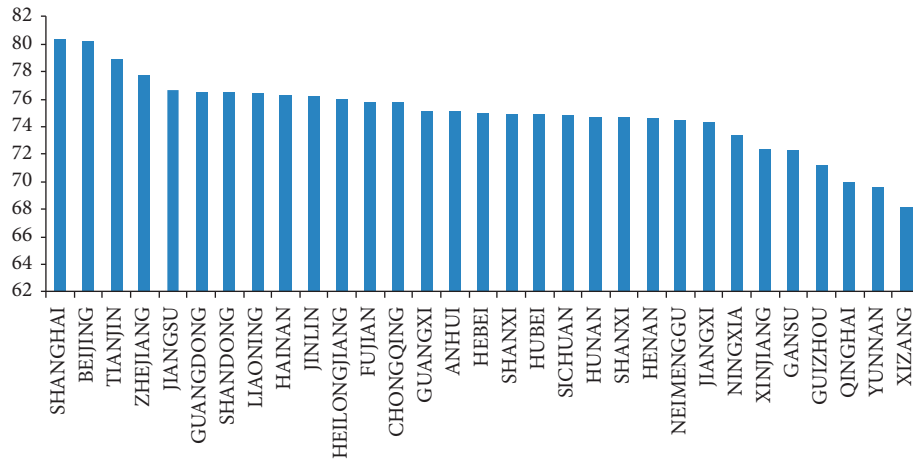


FIGURE 1: Life expectancy of each province in China in 2018.

Many experts and scholars have also conducted theoretical and empirical studies on the social determinants of health [1–6] and pointed out that from the macroscopic factors such as social structural factors to personal microscopic factors such as social psychology there will be a positive role to individual health, but the present study is giving priority to sheer level, as there is rare literature on macroeconomic factors that affect individual health across levels. At the same time, in view of the important role of workers' health, this paper intends to take workers as the special research object in order to uncover the black box of social determinants on workers' health and to explore the mechanism by which macro social determinants affect microindividual health.

The first innovation of this paper is to take labor as the object of study and integrate the working state and social psychological state of the workers into microscopic factors in order to explore the mediating role of the state variable of laborers. The second is to introduce the medical security system as a moderating variable to clarify and verify the moderating role of the medical security system in this cross-level influence. The results are clear and can provide strong theoretical support for China's health policy.

The main framework of the paper is as follows: the second part is theoretical review, the third part is theoretical assumptions, the fourth part is research methods, the fifth part is empirical results and discussion, and the last part is a summary and putting forward the corresponding policy recommendations.

2. Theoretical Review

In the traditional concept of health, the evaluation of health is physiologically oriented. Therefore, WHO and some other world health institutions tend to be technology-oriented and intervene in health problems in a small-scale and technology-oriented way, ignoring the attention to the social background of health. With the failure of the technology led way of health in developing countries in the 1970s, the huge difference in life expectancy between different countries, different regions, or populations in the same country has

deepened people's understanding of health and its influencing factors and made them begin to pay attention to the analysis of "reasons behind the reasons." That is to say, it began to emphasize the vital role of socioeconomic factors in health. In 2005, World Health Organization established the Commission on the Social Determinants of Health, calling on countries to take action on the social roots of health. [7].

WHO refers to all the working and living environments of individual growth other than the pathogenic factors in the traditional concept of health as the social determinants of health. These factors are influenced by macroeconomic conditions, social systems, and even health service policies and are known as "causes of causes" leading to diseases. In terms of the model of social determinants of health, Dahlgren and Whitehead constructed the rainbow model of health determinants in 1991, taking the global social economy as the overall background, determining the standard level of internal factors such as living and working conditions, and finally reflecting on individual health status [8]. In 2002, Galca established a model of social determinants of health in Harlem community of New York and divided the social determinants of health into social factors and individual factors. He also identified that the key social determinant of community health is access to community health services [9]. In 2008, WTO report on *Social Determinants of Health: Closing the Gap in a Generation* developed a conceptual framework model that aims to leverage policy changes to alter the level of social determinants of health. This model treats socioeconomic and health policies as external social conditions and psychosocial factors as one of the determinants of health [10].

Domestic studies on the social determinants of health mainly focus on the impact of economic and social capital such as income and socioeconomic status on individual health, and individual income (Hou et al.; Lowry and Xie; Qi) [11–13], socioeconomic status (Wang Fuqin, 2012) [14], social upward mobility (Wang) [15], etc., all contribute to self-rated health of individuals. With the development of health concept and the deepening of the understanding of health influencing factors, more and more attention has been paid to the influence of social psychological factors on

individual health. Guo Huiling proposed the concept of “from heart to body” to point out the impact of social class on individual health. Similar research perspectives also include subjective class cognition (Wu and Chen) and childhood socioeconomic status (Shen; Zhong) and trust degree (Tang et al.) [16–20].

In general, current studies mainly focus on the impact of individual health determinants on health problems. At the macrolevel, although Liu and Jianxi, Qi and Niu, and Mu and Yuan verified the positive relationship between macro social capital and individual health from the perspective of regional economic development level and government health expenditure [2, 3, 6], these studies have not deeply explored the pathways and micromechanisms of socioeconomic and health policies affecting individual health, and it is difficult to provide targeted recommendations for implementing the health strategy of “integrating health into all policies.” On the other hand, most of the existing studies are common studies on the influencing factors of individual health, and there is a lack of personality studies from the perspective of workers. For workers, the main focus is to verify the negative impact of working hours on workers’ health (Huang and Zhihong; Zhang et al.) [21, 22]. But there are still a series of problems that have not been solved, such as the state of mind in the work of workers that can affect the health of individual workers. Is it possible for socioeconomic and health policies to achieve individual health through psychological mechanisms of work and social psychology among workers? How can the corresponding policy construction and psychological intervention be carried out? In addition, the existing research methods put macro background and individual factors on the same level in the existing literature, ignoring the problem of region-individual nesting in the research data and failing to control the possible group effect between regions and increasing the measurement error of the model. Therefore, this study intends to adopt a layered linear model to study the above problems.

3. Theoretical Hypothesis

3.1. Macro Social Capital and Labor Health. Social capital is a developmental concept involving social processes and conditions that support the development of human and material capital. Social capital research covers three levels: microlevel, mesolevel, and macrolevel. The microlevel includes individual, family, neighborhood, community, etc., the mesolevel includes organization, and the macrolevel includes country or region [1]. Many scholars put forward their own definitions according to their research fields and objects. In the 1990s, since “social capital” was introduced into the field of public health, domestic scholars expanded the macro social capital in the field of public health into the level of regional economic development and health service and conducted a large number of empirical studies on the relationship between social capital and health status [2–6]. In China, there is a significant gap between the eastern and western regions in population health, and the health status of people in the western region is significantly worse than that in the southeastern coastal region (Li Ribang et al., 2004; Liu

Bao et al., 2006). Both economic and social capital and regional medical governance have a significant role in promoting residents’ health and the improvement of residents’ health depends more on government health expenditure than private health expenditure (Liu Heng, Chao Jianqian, 2009; Qi Yaqiang, Niu Jianlin, 2015; Mu Yingtan, Yuan Di, 2018). Since China’s labor force population has accounted for 64% of the total population, we put forward Hypothesis 1 without loss of generality.

Hypothesis 1. The more developed the macro social capital is, the more likely it is to promote the health of the local labor force.

Hypothesis 1a. The more developed the regional economic conditions are, the healthier the local labor force is.

Hypothesis 1b. The greater the investment in local health, the healthier the local working population.

3.2. Macro Social Capital and Labor Status. For laborers, workers psychological state of work mainly includes the psychological state of work and social psychological state. Psychological state of work can be measured by job satisfaction, and it is further divided into some hard indicators, such as salary satisfaction, working environment satisfaction, working time satisfaction, and soft indicators, such as satisfaction with interesting work and satisfaction with working ability (Xie and Zhao; Weiss) [23, 24], based on the framework model of the social determinants of health established by the World Health Organization and existing research findings on psychosocial determinants of health [25, 26]. Social psychological states include happiness, economic satisfaction, sense of fairness, subjective social class cognition, subjective class cognition when young, and crowd trust. Studies show that there are regional differences in laborers’ psychological state. In terms of work status [27, 28], differences in job satisfaction are mainly reflected in differences in regional economic development levels. For example, highly developed workers also have higher job satisfaction (Hualin et al.). In the same region, urban workers with higher economic and social capital have higher satisfaction than township and rural workers (Mu et al.). In terms of social psychological state [29–33], as for happiness (Wang; Ling and Liao), social trust level (Zhang and Ke), and subjective class cognition (Qiu; Chen and Fan), there are significant interprovincial differences, among which the overall level of regional economic development plays a significant role. Based on this, we propose Hypothesis 2.

Hypothesis 2. Social capital can improve the status of workers.

Hypothesis 2.1. The more developed the regional social capital is, the higher the workers’ job satisfaction will be. The workers’ job satisfaction is divided into income satisfaction (M1), work environment satisfaction (M2), work time satisfaction (M3), work interest satisfaction (M4), and work ability satisfaction (M5), thus establishing Hypotheses 2–1, 2–1b, 2–1c, 2–1d, and 2–1e.

Hypothesis 2.2. The more developed the social capital is, the better the social psychological status of the local workers will be. The social psychological state of the workers was divided into subjective well-being (M6), economic satisfaction (M7), fairness (M8), subjective stratum cognition (M9), subjective stratum cognition when they were young (M10), and crowd trust (M11), etc., thus establishing Hypotheses 2-2a, 2-2b, 2-2c, 2-2d, 2-2e, and 2-2f.

3.3. Labor Status and Health of the Labor Force. Among the factors that affect the health of the working population, the state of workers is an important link. In terms of working status, most studies focus on the impact of working hours on labor health, and long working hours have a significant negative impact on workers' physical and mental health (Huang Qingbo, Sa Zhihong, 2015; Zhang Kangfei, Liu Cuihua, Ding Sholei, 2018). In terms of social psychological status, as early as 1980, the Black Report pointed out that people in the upper social class with high socioeconomic status also had better objective health status than those in the lower social status (Black et al.) [34]. Similar researches in China mainly discuss the influence of social psychological state on individual health from the aspects of social class (Guo Huiling, 2016), subjective class cognition (Wu Qingxi, Chen Yunsong, 2015), childhood socioeconomic status (Shen Ke, 2008; Zhong Yaqin, 2014), and trust degree (Tang Ying et al., 2005).

Therefore, we make Hypothesis 3 that the better the condition of the worker, the healthier the worker.

Hypothesis 3.1. The higher the worker's job satisfaction, the better the worker's health. Similar to Hypothesis 2, the labor's job satisfaction is divided into income satisfaction (M1), work environment satisfaction (M2), work time satisfaction (M3), work interest satisfaction (M4), and work ability satisfaction (M5), thus establishing Hypotheses 3-1a, 3-1b, 3-1c, 3-1d, and 3-1e.

Hypothesis 3.2. The better the worker's social psychological state, the healthier the worker. The social psychological state of the workers was divided into subjective well-being (M6), economic satisfaction (M7), fairness (M8), subjective stratum cognition (M9), subjective stratum cognition when they were young (M10), and crowd trust (M11), etc., thus establishing Hypotheses 3-2a, 3-2b, 3-2c, 3-2d, 3-2e, and 3-2f.

3.4. Mediating Effect of Labor State. Since the 1980s, body sociology has become a brand new field of sociology. An important issue that body sociology pays attention to is health, which provides sociological research perspective and care for problems such as body pain and disease [35]. Huiling Guo (2016) extended the body research with theoretical significance to the level of empirical research, proposed the concept of "from mind to body," and verified that people's health condition is achieved by their individual social capital through psychological process. When analyzing the impact of community social capital on health, Kawachi and Berkman pointed out that community social capital may affect

individual health through social psychological process [36]. Similarly, the influence of macro social capital on physical health is also assumed in this paper through individual status. Therefore, Hypothesis 4 is established.

Hypothesis 4. Labor status plays an intermediary role in the regional social capital and labor health.

3.5. Regulatory Role of Medical Insurance Types. In general, participation in health insurance can significantly improve the health of ordinary people (Zhang and Wu; Pan et al.; Wang and Zheng; Zhu and Xu) [37–40]. However, with the deepening of empirical studies, scholars have different understandings of the health effects of different types of medical insurance on different insured groups. For example, Ma et al. [41] believed that high-level medical insurance could better improve the health condition of the insured. Liu et al. [42] found that the health effect of medical insurance was weakened with the improvement of residents' health. Hu et al. [43] pointed out that residents' health insurance could not significantly promote residents' health, but it had a significant health effect on special groups such as the elderly and low-income people. But these studies all confirm the moderating role of medicare in promoting health. So we set up Hypothesis 5 (Figure 2).

Hypothesis 5. The medical insurance system plays a moderating role between regional factors and workers' health.

To sum up, research architecture diagram of this paper is shown in Figure 2.

4. Research Methods

4.1. Data Sources. This paper uses data from the 2016 China Labor Force Dynamic Survey (CLDS) conducted by the Social Science Survey Center of Sun Yat-sen University. (This paper uses data from the China Labor Dynamics Survey (CLDS) conducted by the Social Science Survey Center of Sun Yat-sen University. The author is responsible for the views and contents of this article. For more information on this data, please visit <https://css.sysu.edu.cn>.) The survey uses a multistage, multilayered probability sampling method proportional to the size of the workforce. The sample covers 29 provinces and cities (except Hong Kong, Macao, and Taiwan, Xizang, and Hainan) and includes tracking and cross-sectional data of individual labor force, family, and community, covering migration, education, work, health, social participation, and other information. In this paper, only individual data were used, and the employed population aged 16–60 years were selected as the object of investigation. Questionnaires with no answers or inapplicable results for important factors such as health self-assessment and labor status were eliminated, and a total of 1265 valid individual sample data were obtained for the study.

4.2. Variable Measurement. The dependent variable: in this paper, the individual self-rated health index is considered as the proxy variable of health status, mainly because it is a very effective comprehensive index reflecting individual health

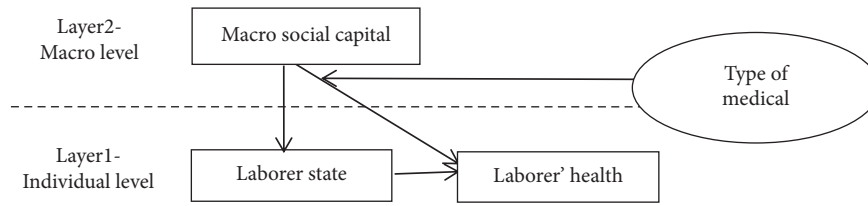


FIGURE 2: Research architecture diagram.

status and has a good reliability. Self-rated health variables correspond to the questionnaire question I9.4.1: “How would you describe your current health?” For convenience, this paper modified the health self-assessment score into positive data. So 1 is very unhealthy, 2 relatively unhealthy, 3 average, 4 healthy, and 5 very healthy.

Macrolevel variables: we represent macro social capital in terms of two variables that reflect economic development and government investment in healthcare (per capita GDP and the proportion of the total health expenses), and variables reflecting the local medical service level and consumption level (per capita consumption expenditure, per capita medical care expenditure, number of beds per thousand people, average length of stay of hospitalized patients, etc.) were used as macrolevel control variables.

Individual level variables: it includes control variables, mediator variables, and moderating variables at the individual level. In terms of control variables, although there are many factors that affect the health of the labor force, in order to simplify the model operation as much as possible, this paper chooses gender and age as the main control variables. Age is a continuous variable and gender is a binary assignment variable.

As for mediator variables, laborer status includes work psychological state indicators and social psychological status indicators, in which job psychological status indicators include income satisfaction (M1), work environment satisfaction (M2), job satisfaction (M3), hours of interest satisfaction (M4), and the satisfaction of working abilities (M5), while social psychological status indicators include subjective well-being (M6), economic satisfaction (M7), a sense of life fairness (M8), subjective perception class (M9), youth subjective perception class (M10), and social trust (M11). Variable assignment is shown in Table 1.

As for moderators, set the type of medical security as mediators. The types of medical insurance in the questionnaire are integrated, and according to the actual reimbursement ratio and the different treatment, the basic medical insurance, public medical insurance, or labor insurance for urban employees is assigned as 3, the basic medical insurance for urban residents, the medical insurance for urban and rural residents, and the new rural cooperative medical insurance are assigned as 2, and no basic medical insurance is assigned as 1. This is a kind of forward data, and the higher the actual reimbursement ratio and the different treatment, the larger the data value.

4.3. Analytical Strategy. Due to the obvious hierarchical relationship and nested relationship (person-region) in the analysis variables, this paper adopts hierarchical linear

model (HLM) to test the hypothesis [44]. The mediating effect of labor status on macro social capital and individual subjective health belongs to the mediating relationship in the form of 2-1-1. The test logic adopted in this paper is as follows: ① examine whether the macro social capital has a significant impact on the state of workers (H2); ② examine whether the status of workers has a significant impact on individual health (H3); ③ examine whether macro social capital has a significant impact on individual health (H1); ④ if the relationship was established, then test macro social capital and whether the laborer state has significant influence on personal health. If the role of macro social capital on individual health is weakened or even no longer significant, then it indicates that the role of social insurance on subjective well-being may be transferred through labor status and the intermediary role of labor status is established. Finally, interactive regression was used to test the moderating effect of medical insurance types on macro social capital and individual subjective health.

5. Empirical Results and Discussion

5.1. Null Model. First of all, HLM analysis, namely, zero model analysis, was carried out on the data without adding any independent variables.

$$\text{Layer 1 model: } Y_{ij} = \beta_{0j} + r_{ij}$$

$$\text{Layer 2 model: } \beta_{0j} = r_{00} + u_{0j}$$

r_{ij} is the residual or random term of layer 1, and the corresponding variance is σ^2 ; u_{0j} is the residual or random term of the function with the intercept of layer 2 as the dependent variable, and the corresponding variance is τ_{00} . The intragroup correlation coefficients ICC can be calculated by using the null model to determine whether there are significant differences between layers and between the impacts of the differences on the dependent variable, $ICC = (\tau_{00}/\tau_{00} + \sigma^2)$. The intragroup correlation coefficients of self-reported health were calculated $ICC = 0.072 / (0.072 + 0.79824) = 0.0834$; it indicates that 8.34% of the difference in self-perceived health among working people is interprovincial. There are significant differences in self-perceived health among regions, so a multilayer linear model should be constructed. ICC for the remaining individual level mediation variables can be obtained by the same procedure, and the results are shown in Table 2.

The ICC values of M2 and M3 in Table 2 are less than 5%, so they cannot pass the null model test. These two variables will not be included in subsequent analysis.

TABLE 1: Variable description and descriptive statistics.

Attribute	The variable name	Assignment and related instructions	Variable source	Sample mean (sample standard deviation)	The minimum value	The maximum value
The dependent variable	Self-reported health	Self-rated health: 1-very unhealthy, 2-relatively unhealthy, 3-average, 4-healthy, 5-very healthy	Personal questionnaire I9.4.1	3.85 (0.92)	1	5
Macrolevel variables	Per capita GDP (unit: yuan)	Continuous variables	2016 China statistical yearbook 2016	52964.65 (22790.90)	26165	107960
	Ln per capita GDP (unit: yuan)	Continuous variables	2016 China statistical yearbook 2016	10.80 (0.40)	10.17	11.59
	The proportion of total health expenditure	Continuous variables	2016 China health statistics yearbook 2016	6.31 (1.50)	4.24	9.63
	Per capita consumption expenditure (unit: yuan)	Continuous variables	2016 China statistical yearbook 2016	15654.05 (5363.24)	10413.80	33802.80
	Healthcare expenditure per capita (unit: yuan)	Continuous variables	2016 China statistical yearbook 2016	1074.90 (317.08)	572	1914.20
	Number of beds per thousand people	Continuous variables	2016 China health statistics yearbook 2016	5.13 (0.62)	4.02	6.27
	Average hospital stay	Continuous variables	2016 China health statistics yearbook 2016	9.68 (0.81)	8.30	11.10

TABLE 1: Continued.

Attribute	The variable name	Assignment and related instructions	Variable source	Sample mean (sample standard deviation)	The minimum value	The maximum value
Individual level variable	Age	Continuous variable, the actual age of the worker in the current period	Personal questionnaire	39.31 (11.48)	16	60
	Gender	Binary assignment variable, male = 1, female = 2	Personal questionnaire	1.43 (0.50)	1	2
	Job income satisfaction	Convert the original backward index into forward index 1-very dissatisfied, 2-not very satisfied, 3-average, 4-relatively satisfied, 5-very satisfied	I7.3.1	3.07 (1.02)	1	5
	Work environment satisfaction	Convert the original backward index into forward index 1-very dissatisfied, 2-not very satisfied, 3-average, 4-relatively satisfied, 5-very satisfied	I7.3.3	3.44 (0.85)	1	5
	Work time satisfaction	Convert the original backward index into forward index 1-very dissatisfied, 2-not very satisfied, 3-average, 4-relatively satisfied, 5-very satisfied	I7.3.4	2.63 (0.90)	1	5
	Job interest satisfaction	Convert the original backward index into forward index 1-very dissatisfied, 2-not very satisfied, 3-average, 4-relatively satisfied, 5-very satisfied	I7.3.6	3.28 (0.90)	1	5
	Job performance satisfaction	Convert the original backward index into forward index 1-very dissatisfied, 2-not very satisfied, 3-average, 4-relatively satisfied, 5-very satisfied	I7.3.8	2.53 (0.81)	1	5
	Subjective well-being	1-very unhappy, 2-not very happy, 3-average, 4-relatively happy, 5-very happy	I7.6.1	3.79 (0.87)	1	5
	Economic satisfaction	1-very dissatisfied, 2-not very satisfied, 3-average, 4-relatively satisfied, 5-very satisfied	I7.6.3	3.29 (0.98)	1	5
	Sense of life fairness	1-totally unfair, 2-relatively unfair, 3-average, 4-relatively fair, 5-completely fair	I7.9	3.31 (0.91)	1	5
	Subjective hierarchical perception	"1" to "10," with "1" representing the bottom and "10" representing the top	I7.10.1	4.34 (1.64)	1	5
	Subjective class perception of family in youth	"1" to "10," with "1" representing the bottom and "10" representing the top	I7.10.4	3.43 (1.77)	1	5
	Social trust	1-complete distrust, 2-distrust, 3-trust, 4-very trust	I7.11	2.87 (0.50)	1	4
	Type of medical insurance	1-not enrolled in social medical insurance; 2-new rural cooperative medical care system, basic medical insurance for urban residents, medical insurance for urban and rural residents; 3-basic medical insurance for employees, free medical care, or labor insurance	According to I1.9-1; I1.19.2; I1.19.3; I1.19.40; I1.19.4 and other issues	2.02 (0.42)	1	3

TABLE 2: Null model test results.

	τ_{00}	σ^2	ICC = $\tau_{00}/(\tau_{00} + \sigma^2)$	χ^2
Self-reported health	0.07264	0.79824	0.0834	105.97432
M1: job income satisfaction	0.12400	0.95091	0.1153	152.94135
M2: work environment satisfaction	0.03413	0.69575	0.0467	78.68440
M3: work time satisfaction	0.04045	0.77611	0.0495	86.64111
M4: job interest satisfaction	0.05405	0.76134	0.06628	110.68124
M5: job performance satisfaction	0.03645	0.62782	0.05487	90.93349
M6: subjective well-being	0.07898	0.69575	0.1019	142.07517
M7: economic satisfaction	0.09750	0.86800	0.1009	150.21388
M8: sense of life fairness	0.05387	0.78214	0.0644	122.03457
M9: subjective hierarchical perception	0.19399	2.53241	0.07115	101.92042
M10: subjective class perception of family in youth	0.20467	2.95792	0.06471	96.46257
M11: crowd trust	0.01329	0.23593	0.053326	93.77229

5.2. *Intercept Result Model Test.* Mediating effect test first tests whether dependent variables and mediating variables can be explained by overall level explanatory variables. Since there are no individual level explanatory variables, this is intercept result model test.

Firstly, model 1 was established to test whether the overall level explanatory variable had a significant impact on the individual level dependent variable, that is, whether the estimated value of γ_{01}^c was significant.

$$\text{Layer 1 model: } Y_{ij} = \beta_{0j}^c + \varepsilon_{ij}^c$$

$$\text{Layer 2 model: } \beta_{0j}^c = \gamma_{00}^c + \gamma_{01}^c X_j + u_{0j}^c$$

Let self-perceived health be the outcome variable, and typical macro social capital variables such as the proportion of total health expenditure (WSZFYZB) and per capita gross national product (LNRJGDP) were selected as independent variables. At the same time, variables such as per capita consumption expenditure (RJXFZC), per capita healthcare expenditure (RJYLB), per thousand beds (CWS), average hospital stay (CYZPJZYR), etc., reflecting local economic level and medical development level, were controlled. The test results are shown in Table 3. As can be seen from Table 3, the improvement of local economic level and the increase of government expenditure on medical and healthcare will bring about the improvement of people's self-perceived health, and this result is significant. Thus, Hypotheses 1a and 1b are verified.

We can also see from Table 3 that increases in healthcare spending per person do significantly help individuals feel better about their health, which is far less than the utility of an increase in the government's share of total health spending. It also suggests to some extent that improving personal health depends more on government health spending than private health spending.

Secondly, model 2 was established, that is, to test whether the overall level explanatory variable has significant influence on the individual level mediator, that is, to judge whether the estimated value of γ_{01}^a is significant. That is, in this process, we set up intercept result model with mediators M1, M4, M5, M6, M7, M8, M9, M10, and M11 as the result variables, and the test results are shown in Table 4.

$$\text{Layer 1 model: } M_{ij} = \beta_{0j}^a + \varepsilon_{ij}^a$$

$$\text{Layer 2 model: } \beta_{0j}^a = \gamma_{00}^a + \gamma_{01}^a X_j + u_{0j}^a$$

As can be seen from Tables 4 and 5, all models and values are positive, and each coefficient has statistical significance. That is, after the regional macro social capital is improved, some status values of workers will be significantly increased, among which job income satisfaction, job interest satisfaction, job ability satisfaction, subjective well-being, economic satisfaction, and sense of life fairness were significantly improved; that is, Hypothesis 2-1a, 2-1d, 2-1e, 2-2a, 2-2b, and 2-2c were established.

5.3. *Random Coefficient Model Test.* At this point, model 3 is established to test whether the interpretation of the individual level explanatory variable (M) as the mediator variable has statistical significance to the interpretation of the result variable (Y), that is, to judge whether the estimate of γ_{10}^b is significant. In this case, the overall level explanatory variable is not included, but only the individual level explanatory variable. Set slope coefficient as random effect, and the test is the random coefficient model test.

$$\text{Layer 1 model: } Y_{ij} = \beta_{0j}^b + \beta_{1j}^b M_{ij} + \varepsilon_{ij}^b$$

$$\text{Layer 2 model: } \beta_{0j}^b = \gamma_{00}^b + u_{0j}^b$$

$$\beta_{1j}^b = \gamma_{10}^b + u_{1j}^b \quad (1)$$

Table 6 shows that although job satisfaction has a positive effect on worker health, these results are not significant. On the other hand, both life satisfaction and family economic satisfaction have positive effects on workers' health; at the same time, we established models 3-1 and proved the robustness of this result. In addition, models 3-1 also confirm the health promotion effect of subjective hierarchical cognition. Therefore, Hypothesis 3-1a, 3-2b, and 3-2e are assumed to be true.

5.4. *Intermediary Effect Model Test.* Establish Model 4, and consider the influence of overall level explanatory variables and individual level mediators on dependent variables. If the

TABLE 3: Model 1: intercept result model test taking Y as dependent variable $Y (X \rightarrow Y)$.

		Fixed effect	
		Coefficient (SE)	$t(p)$
Independent variable	γ_{0i}^c		
	WSZFYZ	0.113233 (0.391)	2.89*** (0.009)
	LNRJGDP	0.768684 (0.371)	2.068* (0.053)
Control variable	CYZPJZYR	-0.205054 (0.056)	-3.628*** (0.002)
	RJXFZC	-0.000083 (0.000)	-3.811*** (0.001)
	RJYLBJ	0.001413 (0.000)	5.3008*** (0.000)
	CWS	-0.363685 (0.064)	-5.672*** (0.000)
Random effect	Intercept variance	χ^2	P-value
	0.02400	44.79791	≤ 0.001

“***,” “**,” and “*” are significant at the statistical level of 1%, 5%, and 10%, respectively.

TABLE 4: Model 2: intercept result model with mediator as result variable (X-M).

	M1: job income satisfaction	M4: job interest satisfaction	M5: job performance satisfaction	M6: happiness of life	M7: family income satisfaction
Coefficient (t -value)					
WSZFYZ (γ_{01}^a)	0.273459*** (2.678)	0.200012*** (3.280)	0.187722*** (3.603)	0.179777** (2.663)	0.224712** (2.265)
LNRJGD (γ_{02}^a)	2.083607** (2.639)	1.365393** (2.677)	1.372029*** (3.385)	1.436794** (2.771)	1.660866** (2.396)
Control variable					
CYZPJZYR	0.027114 (0.219)	0.034635 (0.400)	0.057000 (0.747)	0.098400 (0.913)	-0.036114 (-0.295)
RJXFZC	-0.000071* (-1.735)	-0.000055* (-1.998)	-0.000037* (-1.934)	-0.000056** (-2.466)	-0.000076* (-1.987)
RJYLBJ	-0.0000866* (-1.892)	-0.000434 (-1.213)	-0.000825** (-2.557)	-0.000179 (-0.382)	0.000075 (0.164)
CWS	0.005167 (0.034)	0.016146 (0.149)	-0.001758 (-0.020)	-0.120799 (-1.228)	-0.098817 (-0.656)
Random effect					
Intercept variance	0.10401	0.03677	0.02382	0.05830	0.07305
χ^2	96.07638	58.00786	48.94772	82.72889	80.64757
P-value	≤ 0.001	≤ 0.001	≤ 0.001	≤ 0.001	≤ 0.001

TABLE 5: Model 2: intercept result model with mediator as result variable (X-M) (continued).

	M8: fair satisfaction	M9: subjective hierarchical perception	M10: subjective class perception in youth	M11: crowd trust
Coefficient (t -value)				
WSZFYZ (γ_{01}^a)	0.220475*** (3.416)	-0.060817 (-0.370)	0.050972 (0.286)	0.040894 (1.759)*
LNRJGDP (γ_{02}^a)	1.760347*** (3.611)	-0.120531 (-0.088)	0.322233 (0.219)	0.277541 (1.116)
Control variable				
CYZPJZYR	0.156211* (1.741)	0.075368 (0.389366)	-0.017123 (-0.088)	0.011522 (0.237)
RJXFZC	-0.000036 (-1.652)	0.000031 (0.448)	0.000038 (0.543)	-0.000032 (-2.649)***
RJYLBJ	-0.001045*** (-3.569)	-0.000265 (-0.332)	-0.000596 (-0.745)	0.000159 (0.602)
CWS	0.082232 (1.033)	-0.019361 (-0.077)	0.166869 (0.899)	-0.029861 (-0.699)
Random effect				
Intercept variance	0.02538	0.26322	0.24966	0.00932
χ^2	44.91488	103.06020	81.19237	54.80113
P-value	≤ 0.001	≤ 0.001	≤ 0.001	≤ 0.001

mediator has a significant effect on the dependent variable and the direct effect of overall level explanatory variable on the result variable is not significant or weakened, that is, the estimate of γ_{10}^b is significant and the estimate of γ_{01}^c is not significant, or significant but the absolute value is less than

the absolute value of the estimate of γ_{01}^c , the mediating effect is complete or partial.

$$\text{Layer 1 model: } Y_{ij} = \beta_{0j}^b + \beta_{1j}^b M_{ij} + \epsilon_{ij}^b$$

$$\text{Layer 2 model: } \beta_{0j}^b = \gamma_{00}^b + \gamma_{01}^c X_j + u_{0j}^b$$

TABLE 6: Model 3: random coefficient model machine coefficient model test (M - Y).

		Fixed effect	
Layer 1 variable		Coefficient (t -value)	
Control variable	Age	Model 3 -0.022002*** (-7.894)	Model 3-1 -0.02190*** (-9.971)
	Gender	-0.052785 (-1.213)	-0.060641 (-1.265)
Mediator			
γ_{10}^b	M1: job income satisfaction	0.038889 (0.990)	0.029726 (1.058)
γ_{20}^b	M4: job interest satisfaction	0.049866 (1.530)	0.0453000 (1.305)
γ_{30}^b	M5: job performance satisfaction	0.0538898 (1.248)	0.053380 (1.435)
γ_{40}^b	M6: happiness of life	0.115146*** (2.595)	0.105739*** (3.268)
γ_{50}^b	M7: family income satisfaction	0.126019*** (6.155)	0.105873*** (3.494)
γ_{60}^b	M8: fair satisfaction	-0.018593 (-0.599)	-0.023612 (-0.799)
γ_{70}^b	M9: subjective hierarchical perception		0.042111** (2.306)
γ_{80}^b	M10: class perception when young		0.009592 (0.596)
γ_{90}^b	M11: crowd trust	0.033621 (0.864)	0.028986 (0.575)
Random effect		Intercept variance	0.07663
		χ^2	121.91272
		P value	≤ 0.001

TABLE 7: Model 4 mediation effect model (X , M - Y).

		Fixed effect	
Level-1 variable		Coefficient (SE)	t (p)
Control variable	Age	-0.021994 (0.002)	-7.897 (0.000)
	Gender	-0.049811 (0.043)	-1.144 (0.253)
Mediator	γ_{i0}^b		
	M1 Job income satisfaction	0.038880 (0.039)	0.99 (0.323)
	M4 Job interest satisfaction	0.049811 (0.032)	1.527 (0.127)
	M5 Job performance satisfaction	0.054078 (0.043)	1.251 (0.211)
	M6 Subjective well-being	0.115019 (0.044)	2.593*** (0.010)
	M7 Family income satisfaction	0.125997 (0.020)	6.162*** (0.000)
	M8 Equity satisfaction	-0.018547 (0.030)	-0.598 (0.550)
	M11 Crowd trust	0.033781 (0.038)	0.869 (0.385)
Level-2 variable			
Independent variable	γ_{0i}^c		
	WSZFYZB	0.107674 (0.040)	2.682** (0.015)
	LNRJGDP	0.734788 (0.372)	1.970* (0.064)
Control variable	CYZPJZYR	-0.204996 (0.056)	-3.649*** (0.002)
	RJXFZC	-0.000081 (0.000)	-3.752*** (0.001)
	RJYLBJ	0.001414 (0.000)	5.380*** (0.000)
	CWS	-0.358616 (0.065)	-5.474*** (0.000)
Random effect	Intercept variance	χ^2	P -value
	0.02691	52.06869	≤ 0.001

$$\beta_{1j}^b = \gamma_{10}^b \quad (2)$$

Since the coefficient of life satisfaction and family income satisfaction is significant, it is found in Tables 3 and 7 that part of the cross-hierarchy mediation effect is valid. That is, the positive effect of macro social capital on health is partly realized through the satisfaction of individual life and family economic status of workers. So Hypothesis 4 is true.

5.5. Adjustment Effect Test. To test the adjustment effect of medical insurance types, this part establishes model 5. It is

intended to test the adjustment effect through the interaction regression, that is, to construct the interaction term between the medical insurance type and the macro social capital and to judge whether the influence of macro social capital on individual health changes with the different conditions of the medical insurance type. The test results are shown in Table 8.

As can be seen from Table 8, high macro social capital is significantly beneficial to the improvement of individual health of workers. On the other hand, although the type of high insurance participation is positively correlated with individual health, the type of insurance participation has a

TABLE 8: Model 5: adjustment effect model.

		Fixed effect	
		Coefficient (SE)	t(p)
Level-1 variable			
	M1: job income satisfaction	0.036895 (0.039)	0.924 (0.355)
	M4: job interest satisfaction	0.032407 (0.031)	1.019 (0.309)
	M5: job performance satisfaction	0.062349 (0.044)	1.404 (0.160)
Mediator			
	M6: subjective well-being	0.143064 (0.042)	3.360*** (0.000)
	M7: family income satisfaction	0.127132 (0.018)	0.936*** (0.000)
	M8: equity satisfaction	-0.014224 (0.029)	-0.475 (0.635)
	M11: crowd trust	-0.061849 (0.044)	-1.400 (0.162)
Level-2 variable			
Independent variable			
	WSZFYZB	0.1118111 (0.039)	2.818** (0.011)
	LNRJGDP	0.762294 (0.373)	2.040* (0.055)
	CYZPJZYR	-0.204260 (0.056)	-3.624*** (0.002)
Control variable			
	RJXFZC	-0.000082 (0.000)	-3.794*** (0.001)
	RJYLBJ	0.001410 (0.000)	-5.623*** (0.000)
	CWS	-0.363073 (0.064)	-5.623*** (0.000)
Cross-level interaction item			
	Type of insurance * WSZFYZB	-0.055371 (0.032)	-1.720* (0.086)
	Type of insurance * LNRJGDP	-0.362243 (0.166)	-2.179** (0.030)
Random effect			
	Intercept variance	χ^2	P-value
	0.02536	47.93110	≤0.001

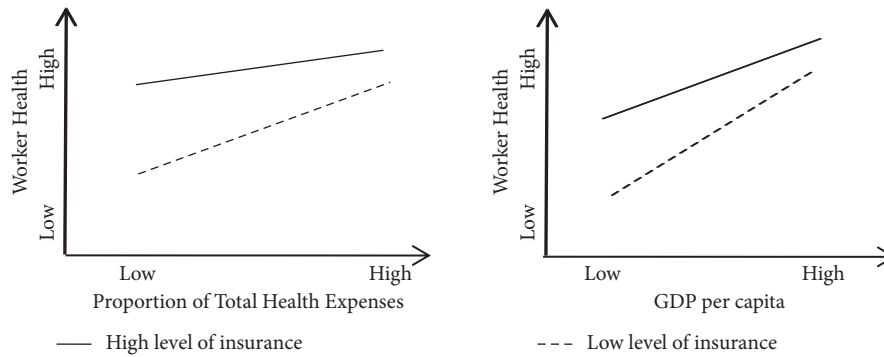


FIGURE 3: Moderating effect of insurance types.

negative moderating effect on the promotion effect of macro social capital on individual health (the interaction coefficient is opposite to the independent variable coefficient and reaches the level of statistical significance). The positive effect between macro social capital and individual health of workers is significantly lower in the high medical insurance type than in the low medical insurance type. That is to say, compared with employee medical insurance, public medical insurance, and labor insurance medical personnel, the promotion effect of macro social capital on individual health is more effective for the uninsured, rural insurance, and resident medical insurance personnel.

In order to more clearly reveal the moderating effect of medical insurance type on the relationship between macro social capital and self-rated health of individuals, Figure 3 shows the results of the moderating effect. Add or subtract one standard deviation for insurance type and divide the data into two groups, with the proportion of total health expenditure in macro social capital or per capita GDP as independent variables and individual health as dependent variable, respectively, and the moderating effect of insurance

type on macro social capital and individual health is shown in Figure 3. For people with high medical insurance, macro social capital has a weak positive correlation with health, while for people with low medical insurance, macro social capital has a strong positive correlation with health.

6. Main Conclusions

6.1. *Macro Social Capital and Individual Health of Workers.* There are regional differences in people's health, and high macro social capital is better than low macro social capital to promote the health of workers. Therefore, health needs to be paid attention to by both the country and the society. To improve the level of regional economic development and to promote the total investment in local health are all conducive to improving the health of local people. At the same time, although the increase of per capita healthcare expenditure does significantly benefit the self-perceived health of individuals, the value is far lower than the utility brought by the increase of the total health expenditure of the government, which also indicates to some extent that the improvement of

the personal health of workers depends more on government health expenditure than private health expenditure.

6.2. The Intermediary Effect of the Status of Laborers. After enhanced regional macro social capital, the working state and the social psychological state were improved, and the state can help you to enhance the level of personal health. At the same time, the empirical results show that only workers' subjective well-being and workers' family economic conditions satisfaction can partially mediate the macro social capital for the promotion of health. Therefore, this sentence, "from mind to body," has been proved again. With developed socioeconomic status, the government's emphasis on health and the basic hygiene level of the area will help improve the health of individuals in which microscopic conduction mechanism runs by increasing the individual subjective well-being and satisfaction of family economy. So laborer mentality health, ability to perceive happiness actively, and good economic income satisfaction are the best weapon of individual health.

6.3. Adjusting Ting Effect of Medical Insurance Type. The empirical results show that although macro social capital can help improve individual health, its influence declines with the increase of medical insurance type. This conclusion suggests that we should focus on the improvement of the overall macro social capital rather than focusing on the level of medical treatment enjoyed by individuals. In China at the beginning of the founding, there was a situation that "the expenditure for 8.3 million people enjoying public medical care was more than that for 500 million farmers." The rural cooperative medical care system, which began to emerge in the mid-1950s, putting the focus of medical care and healthcare on the countryside, greatly improved the level of rural medical care and healthcare and improved the health of local farmers. The outcome has been described by the World Bank and the World Health Organization as "the only example of how a developing country can pay for health." At present, the achievements of the new rural cooperative medical care system and the resident medical insurance system have all confirmed this policy effect to a certain extent. That is, the Chinese government focuses on strengthening the overall health of society, rather than investing more human and material resources in specific groups. In the future, we must strengthen the government's responsibility in the reform of the health system, increase government spending on public health, and at the same time build a network of basic medical insurance to ensure that everyone has the right to quality basic medical and health services, so as to ensure the health of the whole people.

To sum up, policies should focus on strengthening the overall health level of society, increasing government spending on public health, promoting the improvement of individual livelihood, personal happiness, and economic prosperity, and thus promoting the realization of workers' health.

Data Availability

No data were used to support this study.

Conflicts of Interest

There are no potential conflicts of interest in this study.

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