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The health status and its influencing factors of Chinese employees: A survey study

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Abstract

This paper presents a multinomial logistic regression model of health status based on data of 2710 employees from 10 provinces and regions in China in a July 2015 survey, which employed a three-stage stratified sampling method. The determinants of the health status of Chinese employees could be analyzed by four dimensions: individual characteristics, socio-economic characteristics, family characteristics, and job characteristics. We find that: (1) about 73.64% of the survey respondents reported good and excellent self-rated health, and only 5.13% of the survey respondents reported bad self-rated health; (2) the main factors influencing the employees' health includes ethnicity, the proportion of health expenditure, region, the number of children and elders, salary, work conditions and work pressure; (3) compared with others, job characteristics is the most important influence factors to employees; (4) the national differences were obvious in the health status of Chinese employees, which was due to the cultivation of healthy dietetic and trophic habit and the health knowledge inquiry habit from childhood.

Keywords: Chinses employees, health status, national difference

1. Introduction

Health is a necessary prerequisite for the overall development of the people, as well as the foundation for the sustainable development of the society. In order to improve people's health, the Political Bureau of the Communist Party of China Central Committee approved the Plan for a Healthy China 2030 (HC2030). Based on the whole population and the life cycle, it is important to study the main health problems and its influencing factors at different stages of life. In all kinds of groups, the employees in the working-period who bears the dual responsibility of caring for the family and earning income.

In China, the "4-2-1" family structure and the fierce competition form work pose a risk to employees' health. Several studies showed that about 76% employees in first-tier cities are in the state of sub-health prematurely (Meng, 2014). As an important form of human capital, health will not only directly affect the productivity of workers at a micro level, but also affect the total economic output at a macro level (Grossman, 1972; Wang & Liu, 2005) [6, 17]. Therefore, it is great practical significance to pay close to the health status of Chinese employees and its influencing factors, which will help Chinese government improve the accuracy of public health policy.

2. Literature review

At present, some studies has analyzed the factors related to the health status of Chinses employees and can be divided into four categories: individual characteristics, socio-economic characteristics, family characteristics, and job characteristics.

2.1 Individual characteristics

On the whole, studies have shown that age, gender, marital status and other factors can significantly affect the health status of Chinses employees. Schultz (1999) [15] found that there is an "inverted U" relationship between age and health conditions, and the inflection point which varies from population to population usually occurs in adulthood. The Chinese rural population enjoy the best health about age 30 (Zhao, 2006) [22], while the working population about age 23 (Gao *et al.*, 2018) [5]. A lot of studies have shown that males, compared to females, are healthier in different ages and shorter life spans at the overall level

(Dubikaytis *et al.*, 2014) [4]. This gender differences in health is classically described as "men are more likely to die than women, but women are more tolerant of disease than men" (Zheng & Zeng, 2016) [23]. Okamoto & Harasawa (2009) [13] revealed that marriage status is positively related to health level, which means that people with better health are married.

2.2 Socio-economic characteristics

Some studies have shown that income level is positively related to health status. That is to say, the higher your income, the healthier you will be (Benzeval *et al.*, 2001; Qi, 2006) [14]. However, income level is very controversial factor. A lot of researches denied that income have effect on the health status. They highlighted the fact that education plays a key role in the relationship between income and health. Moen (1999) [11] found that person with a good education usually get better working environment, income level and living environment, which relaxes the budget constraint of health investment. On the other hand, person with a good education have the information advantage of health care and relatively healthy habits, which reduces the depreciation rate of health capital (Cutler & Llerasmuney, 2010) [2]. Using Chinese General Social Survey date in 2010, Hu (2014) [8] showed that education improves the health status of Chinese urban and rural residents, and the quality of education is positively correlated with health level. In addition, Du & Wang (2013) [3] found that the health status of the population in the east is usually better than that in the west of China because of the disparity of regional economic development and the imbalance of medical resources allocation.

2.3 Family characteristics

As a traditional relationship society, family social network formed by kinship and consanguinity have a very inconvenient influent on health status of Chinese employees. Zhao (2006) [22] found that families with large population have better health status. Person with big family social network usually gets more economic support, which effectively alleviate the damage of income gap to one's health (Zhou *et al.*, 2014) [24]. In addition, Xiong *et al.* (2016) [18] believes that social activities and interpersonal communication have a positive impact on health because these activities can alleviate pressure, promote the circulation and dissemination of health care information, and improve unhealthy living habits.

2.4 Job characteristics

There is no doubt that the health status of employees is closely related to the occupation which they engages in. In term of career types, the agricultural producers have a relatively poor mental and physical health. For non-agricultural workers, the worse the working environment, the worse the health status of employees (Niu *et al.*, 2011; Liang & Xiong, 2015) [12, 15]. For urban employees, the more stable the work, the better the health (Yu *et al.*, 2010) [19]. Haines *et al.* (2010) found that constant high-intensity work may lead to increase the probability of workers suffering from hypertension and digestive tract diseases. Zhang (2018) [21] noted that working hours is negatively related to the health status of Chinese employees, especially in the groups who engage in the tertiary industry. With greater job stress, there is a higher likelihood that employees make their

health self-evaluation worse. An investigation revealed that 40% of employees worry about dying at work (Shu & Liao, 2002) [16]. Magee *et al.* (2011) [10] found that many workers are obese because they overeat due to excessive work pressure.

Reviewing past studies shows that there is an absence of studies on the health status of Chinese employees. Further empirical studies regarding the determinants of workers' health statuses are needed. In this paper, we consider other new factors related to the health status of Chinese workers. The purpose of this study was to 1) determine Chinese employees' health status and to 2) evaluate the factors that account for them.

3. Method

3.1 Survey Design and Sample Selection

Data were derived from the Survey on the Working Status and Retirement Intentions of Chinese Workers (2015), which was conducted by the College of Public Management at Northwest University from July to September 2015. This survey used a three-stage stratified sampling method (province, city, and county). In the first stage, 31 provinces in China were divided into three parts geographically, namely, eastern, central and western, which were clustered by the government administrative geographic system. In the second stage, sample cities were selected by region as follows: Beijing, Nanjing, and Guangzhou in the east; Zhengzhou and Wuhan in the middle; Xi'an, Lanzhou, Chengdu, Xi'ning and Urumqi in the west. In the third stage, 3224 respondents were identified in these cities. All the respondents were aged 16 years or older, but retirees and unemployed individuals were invited to finish the questionnaire. The *Survey on the Working Status and Retirement Intentions of Chinese Workers* contained detailed information on individual characteristics, socio-economic characteristics, job characteristics and family characteristics. After excluding observations with missing values for pertinent variables, our analysis data contained 2492 survey respondents, representing 77.30% of the original sample.

3.2 Measures

3.2.1 Outcome measure: self-rated health

The dependent variable in this study was the self-rated health of the survey respondents. Self-rated health was evaluated by the question "How do you rate your health?", and the respondents answered using a 10-point scale (0-9). The scores were divided into classes: bad, score 0-3; mediate, score 4-5; good, score 6-7; excellent, score 8-9.

3.2.2 Explanatory variables

The following four categories of explanatory variables were used: individual characteristics, socio-economic characteristics, job characteristics and family characteristics. Individual characteristics. Following the tradition of previous empirical studies, individual characteristics included gender, ethnicity, age and marital status. Age was divided into four groups: 16-30 years, 31-45 years, 46-60 years and over 60 years old. Marital status was categorized as single, married, divorced or widowed.

Socio-economic characteristics. Socio-economic characteristics usually includes education, income and occupation. In this paper, income and occupation as part of job characteristics. Besides education, this paper takes regions and health expenditure as part of socio-economic

characteristics. Education was divided into five classes: primary education (including primary or no education), secondary education (including middle or high school), higher vocational education, college education, master or higher education. Region was divided into three groups: east, middle and west. Health expenditure which means that the proportion of health expenditure accounts for the total family income was divided into four classes: under 10%, about 20%, about 30%, over 40%.

Family characteristics. Family characteristics included the family size, the number of children and elders (number of children and elders) and the number of family members with stable income sources (number of members with income). Family size was divided into three groups: under 3, 4 or 5, over 6. Number of children and elders was divided into five groups: 0, 1, 2, 3, over 4. Number of members with income was divided into three groups: 1, 2, over 3.

Job characteristics. Job-related questions included the type of occupation (government, public institutions, enterprise), satisfaction with salary (dissatisfied, average, or satisfied), satisfaction with work benefits (dissatisfied, average, or satisfied), level of work stress (more, average, or less), and satisfaction with working conditions (dissatisfied, average, or satisfied).

3.3 Statistical Analysis

Descriptive characteristics of the dependent and explanatory variables are presented in Table 1. We then assessed the distribution of the self-rated health across individual, socio-economic, family and job characteristics (Table 2). Pearson's chi-square test was used to examine statistical significance between categorical variables. A multinomial ordered logistic regression model was employed to analyze the determinants of the health status of Chinese employees, in which employees who self-rated health is bad were used as the reference group. Odds ratios (ORs) are reported (Table 3). Model 1 includes all the individual characteristics. In the fitting of Model 2, we added socio-economic characteristics as explanatory variables to determine whether these factors further explained the effects on the health status of Chinese employees. After fitting Model 2, we added family characteristics to Model 3 and job characteristics to Model 4 (see Table 3). All the results were reflected by ORs at 95% confidence intervals (CIs). All the analyses were performed by SPSS, version 19.0.

4. Results

4.1 Sample Characteristics

Table 1 presents the descriptive statistics of the dependent and explanatory variables. Approximately 73.64% of the respondents had good and excellent self-rated health, only 5.13% of respondents had bad self-rated health. Our respondents were almost equally divided according to gender (51.77% vs 48.23%). They were mostly of Han nationality (95.06%), aged 16-45 years (72.79%) and

married (74%). Approximately 80.81% of the respondents had a higher vocational education or higher education. More than two-thirds of the respondents (71.59%) were employed in enterprises. Only approximately one-fifth of them reported that they were satisfied with their salary (18.46%), work benefits (18.34%) and work stress level (20.06%). Approximately one-third of the respondents reported that they were satisfied with their work conditions. Approximately 28.97% of the survey respondents had more than 3 children or elderly individuals to care for.

4.2 Distribution of self-rated health

Table 2 presents the distribution of self-rated health across individual, socio-economic, family and job characteristics stratified by each potential explanatory variable in the four categories. The chi-square test was used to assess whether there were significant differences between self-rated healths for each explanatory variable. Gender, ethnicity and type of occupation were not significant, with a p-value greater than 0.05. However, age, marital status, education, the proportion of health expenditure, region, family size, the number of children and elders, and the number of members with income, salary, work benefits, work conditions and work pressure were significant factors.

In total, respondents aged 31-45 who were Han nationality, single and located in east and have a big family. Those respondents with excellent or good self-rated health were also satisfied with their salary, work benefits and work conditions. Respondents located in west who were other ethnic minorities, divorced or separated and dissatisfied with their salary, work benefits, work stress or work conditions.

4.3 Determinants of self-rated health

Table 3 presents the multinomial ordered logistic regression results of the health status of Chinese employees, in which employees who self-rated health is bad were used as the reference variable. Gender, education and type of occupation were not significant, with a p-value greater than 0.05. However, ethnicity, the proportion of health expenditure, region, the number of children and elders, salary, work conditions and work pressure were significant factors. In logistic analysis, the coefficients of determination of the models (Nagelkerke R^2) gradually increased from 0.013 (Model 1) to 0.034 (Model 2), then from 0.034 to 0.052 (Model 3), then from 0.052 to 0.083 (Model 4), which indicated that the job characteristics is the most important factor affecting the health status of Chinese employees. When combined into one model (Model 4), the respondents who reported Han nationality (OR 0.618), located in east (OR 0.812) and satisfaction with salary (OR 0.568), work conditions (OR 0.762) and work stress (OR 0.799) were more health. Those who had a higher proportion of health expenditure (OR 1.756) and higher number of children and elders (OR 1.730) were less health.

Table 1: Descriptive statistic of the total study population (N=2492)

Variables	Category	Number	Percent
Dependent variable			
Self-rated health	excellent	671	26.93
	good	1164	46.71
	mediate	529	21.23
	bad	128	5.13
Independent variables			
Individual characteristics			
Gender	Male	1290	51.77
	Female	1202	48.23
Ethnicity	Han nationality	2369	95.06
	Other ethnic minorities	123	4.94
Age group	61+	14	0.56
	46-60	664	26.65
	31-45	963	38.64
	16-30	851	34.15
Marital status	Divorced or separated	61	2.45
	Married	1844	74.0
	Single	587	23.55
Socio-economic characteristics			
Education degree	Master or higher education	337	13.52
	College education	1036	41.57
	Higher vocational education	641	25.72
	Secondary education	369	14.81
	Primary or no education	109	4.38
proportion of health expenditure	Over 40%	46	1.85
	About 30%	220	8.83
	About 20%	853	34.23
	Under 10%	1373	55.09
Region	East	812	32.58
	Middle	787	31.58
	West	893	35.84
Family characteristics			
Family size	Over 6	186	7.46
	4-5	1029	41.29
	Under 3	1277	51.25
Number of children and elders	Over 4	722	28.97
	3	475	19.06
	2	585	23.48
	1	334	13.40
	0	376	15.09
Number of members with income	Over 3	189	7.58
	2	1291	51.81
	1	1012	40.61
Job characteristics			
Type of occupation	Enterprise	1784	71.59
	Public institutions	425	17.05
	Government	283	11.36
Self-rated salary	Satisfied	460	18.46
	Average	1236	49.60
	Dissatisfied	796	31.94
Self-rated work benefits	Satisfied	457	18.34
	Average	1124	45.10
	Dissatisfied	911	36.56
Self-rated work conditions	Satisfied	826	33.15
	Average	1200	48.15
	Dissatisfied	466	18.70
Self-rated work stress	Satisfied	500	20.06
	Average	1290	51.77
	Dissatisfied	702	28.17

Table 2: The distribution of self-rated health across individual characteristics, socio-economic characteristics, family characteristics and job characteristics

Variables	Category	Self-rate health				χ^2	Sig
		excellent	good	mediate	bad		
Individual characteristics							
Gender	Male	27.91	45.43	21.09	5.57	2.955	0.399
	Female	25.87	48.09	21.38	4.66		
Ethnicity	Han nationality	27.23	46.94	20.81	5.02	7.292	0.063
	Other ethnic minorities	21.14	42.28	29.27	7.31		
Age group	61+	27.73	50.06	17.74	4.47	25.412	0.003
	46-60	23.88	46.31	24.09	5.72		
	31-45	30.57	43.07	21.08	5.28		
	16-30	14.29	42.86	42.85	0.00		
Marital status	Divorced or separated	27.87	39.34	24.59	8.20	19.023	0.004
	Married	25.92	45.82	22.83	5.43		
	Single	29.98	50.26	15.84	3.92		
Socio-economic characteristics							
Education degree	Master or higher education	18.99	56.08	20.47	4.46	50.309	<0.001
	College education	25.19	48.65	20.66	5.50		
	Higher vocational education	31.05	46.33	17.94	4.68		
	Secondary education	29.54	38.48	26.29	5.69		
	Primary or no education	34.86	29.36	31.19	4.59		
proportion of health expenditure	Over 40%	21.74	34.78	34.78	8.70	26.928	0.001
	About 30%	19.09	47.27	25.91	7.73		
	About 20%	30.95	45.60	19.46	3.99		
	Under 10%	25.86	47.71	21.12	5.31		
Region	East	34.48	41.75	19.70	4.07	38.386	<0.001
	Middle	22.36	50.44	22.24	4.96		
	West	24.08	47.93	21.72	6.27		
Family characteristics							
Family size	Over 6	32.80	42.47	21.51	3.22	11.042	0.087
	4-5	24.39	46.94	22.93	5.74		
	Under 3	28.11	47.14	19.81	4.94		
Number of children and elders	Over 4	20.50	47.09	26.18	6.23	65.369	<0.001
	3	22.74	49.47	21.47	6.32		
	2	26.84	47.69	21.03	4.44		
	1	36.53	41.62	16.77	5.08		
	0	36.17	45.48	15.69	2.66		
Number of members with income	Over 3	28.57	37.04	24.87	9.52	29.849	<0.001
	2	26.10	47.02	20.45	6.43		
	1	27.67	48.12	21.54	2.67		
Job characteristics							
Type of occupation	Enterprise	26.01	47.48	21.75	4.76	7.208	0.302
	Public institutions	30.35	42.82	20.94	5.89		
	Government	27.56	47.70	18.37	6.37		
Self-rated salary	Satisfied	36.52	49.78	12.39	1.31	75.684	<0.001
	Average	25.89	47.25	22.41	4.45		
	Dissatisfied	22.99	44.10	24.50	8.41		
Self-rated work benefits	Satisfied	35.01	49.45	13.79	1.75	64.172	<0.001
	Average	26.25	46.98	22.95	3.82		
	Dissatisfied	23.71	45.01	22.83	8.45		
Self-rated work conditions	Satisfied	32.20	45.64	19.13	3.03	57.869	<0.001
	Average	25.33	48.83	21.42	4.42		
	Dissatisfied	21.67	43.13	24.46	10.74		
Self-rated work stress	Satisfied	31.60	47.60	18.20	12.60	77.343	<0.001
	Average	27.36	48.84	20.70	3.10		
	Dissatisfied	22.79	42.17	24.36	10.68		

Table 3 Determinants of self-rated health of Chinese employees

Variables	Category	Model1`	Model2	Model3	Model4
Gender	Male	0.993	1.102	0.988	0.963
	Female				
Ethnicity	Han nationality	0.657**	0.693**	0.680**	0.618***
	Other ethnic minorities				
Age group	61+	1.647	1.560	1.840	1.853
	46-60	0.843	0.890	0.997	1.069
	31-45	1.099	1.119	1.080	1.099
	16-30				
Marital status	Divorced or separated	1.492	1.362	1.137	1.236
	Married	1.385***	1.336**	1.10	1.084
	Single				
Education degree	Master or higher education		1.044	1.047	1.220
	College education		0.973	0.975	1.092
	Higher vocational education		0.787	0.779	0.857
	Secondary education		1.059	1.079	1.139
	Primary or no education				
proportion of health expenditure	Over 40%		1.752**	1.745**	1.756**
	About 30%		1.441***	1.477***	1.484***
	About 20%		0.826**	0.856*	0.884
	Under 10%				
Region	East		0.724***	0.781**	0.812**
	Middle		1.046	1.044	0.999
	West				
Family size				0.865	0.850
	4-5			1.125	1.120
	Under 3				
Number of children and elders	Over 4			1.889***	1.730***
	3			1.608***	1.579***
	2			1.448***	1.380**
	1			1.044	1.093
	0				
Number of members with income	Over 3			1.344*	1.250
	2			1.075	1.064
	1				
Type of occupation	Enterprise				1.178
	Public institutions				0.997
	Government				
Self-rated salary	Satisfied				0.568***
	Average				0.872
	Dissatisfied				
Self-rated work benefits	Satisfied				0.894
	Average				1.064
	Dissatisfied				
Self-rated work conditions	Satisfied				0.762**
	Average				0.853
	Dissatisfied				
Self-rated work stress	Satisfied				0.799*
	Average				0.705***
	Dissatisfied				
The fitness of the model	χ^2	28.465	78.229	120.801	194.963
	NagelkerkeR ²	0.013	0.034	0.052	0.083

Note: ***p < 0.01, **p < 0.05, *p < 0.1

5. Discussion

To examine the various factors related to the health status of Chinese employees, all explanatory variables in this paper are classified into four categories: individual, socio-economic, family and job characteristics. To the best of our knowledge, few studies have assessed the determinants of the health status of Chinese employees. Our study provides evidence of the association between health status and several individual, socio-economic, family and job characteristics. In total, only 5.13% of the survey respondents reported that their self-rated health is bad. 21.23% of the survey respondents' self-rated health is

mediate, 46.71% is good and 26.93% is excellent. Overall, most Chinese employees are in better health.

We found that individual characteristics have a weak influence on health status of Chinese status. In this paper, we obtained some very different conclusions. Our first observation was that health status of Chinese employees do not show gender differences, which is in contradiction with Liang *et al.* (2006) arguments. The reason is that there are differences in research samples. Liang *et al.* (2006) research sample included urban employees and rural employees, but our research sample just urban employees. A lot of studies pointed out that health status of urban dwellers have no

gender differences (Yu *et al.*, 2010) ^[19]. There is no "inverted U" relationship between age and health status of Chinese employees. Actually, age do not have any influences to Chinese employees' health, as well as marriage status. Compared with the other ethnic minorities, the probability that the Han nationality employees' self-rated health with one grade lower is only 61.8%. That is to say, the health status of the Han nationality is better than the other ethnic minorities. This national differences were obvious in the health status of Chinese employees, which was due to the cultivation of healthy dietetic and trophic habit and the health knowledge inquiry habit from childhood (Sun, 2014; Zeng *et al.*, 2016) ^[23].

Many studies have found a strong association between socio-economic characteristics and health status of Chinese employees, especially degree of education and self-rated health. However, we found that education do not have statistically significant and positive effect on health status of Chinese employees. A good education usually relaxes the budget constraint of health invest and reduces the depreciation rate of health capital (Hu, 2014) ^[8], but the education marginal return is descending as the improvement of the average educational level of the employees. In our research sample, only 4.38% of respondents' educational degree is below primary, and 80.81% of respondents is higher vocational education or above. Some studies pointed that education is no longer a robustness factor (Yu *et al.*, 2014) ^[19]. The health status of Chinese employees in the east is better than in the west of China because of the disparity of regional economic development and the imbalance of medical resources allocation.

Family characteristics is entwined with the health status of Chinese employees. Our findings do not support the viewpoint that family size close to the health status of Chinese employees (Zhao, 2006) ^[22]. The number of children and elders in the family was significantly negatively related to health status of Chinese employees. That is to say, supporting the elders and raising children will damage the health of Chinese employees.

Previous studies have found a strong association between job characteristics and health status of Chinese employees. Our findings do not support the viewpoint that health status of Chinese employees is closely related to the occupation which they engages in.

And there is no evidence that health status of employees have stable connection with the work benefits. Compared with those who were dissatisfied with their salaries, work conditions and work stress, respondents who were satisfied with their salaries, work conditions and work stress were more health.

6. Conclusion

Our findings reveal that individual characteristics, socio-economic characteristics, family characteristics and job characteristics were associated with health status of Chinese employees. In total, only 5.13% of the survey respondents reported that their self-rated health is bad. 21.23% of the survey respondents' self-rated health is mediate, 46.71% is good and 26.93% is excellent. Overall, most Chinese employees are in better health. Job characteristics (salary, work conditions and work stress) were the main factors related to the health status of Chinese employees. Gender, age, marriage status and education do not have significant influences to Chinese employees' health. The health status

of Chinese employees in the east is better than in the west of China because of the disparity of regional economic development and the imbalance of medical resources allocation. The number of children and elders in the family was significantly negatively related to health status of Chinese employees. Compared with those who were dissatisfied with their salaries, work conditions and work stress, respondents who were satisfied with their salaries, work conditions and work stress were more health. The health status of the Han nationality is better than the other ethnic minorities. This national differences were obvious in the health status of Chinese employees, which was due to the cultivation of healthy dietetic and trophic habit and the health knowledge inquiry habit from childhood.

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