

# Exploration of More Effective Incentives for General Practitioners: Finding From a Cross-sectional Study in Jiangsu Province

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## Research article

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# Abstract

**Background** With the increasing demand for public health, the Chinese government attaches great importance to the important role of general practitioners in primary health care. The purpose of this study is to find out the factors that affect the incentive effect of general practitioners in Jiangsu province and evaluate the incentive effect reasonably.

**Methods** From April to May 2020, 910 primary-level general practitioners were investigated in 130 primary medical institutions in Jiangsu province. 837 effective questionnaires were collected. The questionnaire is divided into two parts: general practitioner characteristics and motivational effect scale. Logistic regression analysis was used to analyze the factors influencing the incentive effect of general practitioners.

**Results** The results showed that age, weekly working hours and daily sleeping duration affected job satisfaction. Factors influencing willingness to work hard including: weekly working hours, daily sleeping duration, and physical exercise frequency. Age, weekly working hours and daily sleeping duration were the factors influencing turnover tendency. Factors influencing incentive effects including: weekly working hours, average monthly income and years of working as a general practitioner.

**Conclusions** The study found that the turnover intention of general practitioners in primary medical institutions would be significantly reduced, the job satisfaction, willingness to work hard and overall incentive effect would be significantly increased, especially if the working hours per week were reduced, the sleeping hours per day were increased, and the frequency of physical exercise was increased. Helping general practitioners to develop good living habits could be a key incentive for future generations.

## 1. Background

In 2011, the Chinese government proposed that "by 2020, there will be 2–3 qualified general practitioners for every 10,000 residents in urban and rural areas". The Chinese government attaches great importance to the important role of general practitioners in primary health care, community basic medical care and public health services. However, the current phenomenon of insufficient number, low quality, uneven distribution and serious loss of general practitioners has not been fundamentally changed [1]. Most of the medical students with high degree and high quality are still developing towards specialized doctors. Foreign general practitioners are currently facing shortage of general practitioners, or general practitioners do not want to go to rural areas and so on a series of problems. How to pay incentives to guide more general practitioners to remote rural area is the focus of nearly five years' study of general practitioners incentives. Therefore, speeding up the construction of a perfect incentive mechanism for general practitioners can effectively enhance the attractiveness of the position of general practitioners, promote the stable development of the general practitioners team, and guarantee the life and health of the people in an all-round full cycle [2].

At present, foreign countries have launched a series of salary incentive models, which pay attention to the non-monetary salary reward of general practitioners while providing basic salary[3]. The United States, Britain, Japan, Australia and other countries have produced a set of performance incentive system suitable for their own countries according to their own national conditions. For example, the VALUE-based Pay for Performance (VBFPF) project developed in the United States mainly incentivize general practitioners through economic incentives and publicly recognized rewards[3, 4]. The UK promotes the development of general practitioners in many aspects by combining incentives with constraints [5–7].Australia mainly adopts the incentives of salary and benefits for medical personnel, and meanwhile implements the Practice Incentives Program (PIP) to increase the incentives for general practitioners [8].Japan also takes full account of the practical psychological needs of general practitioners and attaches great importance to non-economic remuneration in addition to the basic salary. Therefore, it is very necessary to establish the incentive mechanism that reflects the value of doctors' labor services, which is conducive to the mobilization of work enthusiasm.

Existing studies have found that the factors affecting the incentive effect of general practitioners include: fair pay, job stability, income, working hours, administrative burden, work intensity and other monetary remuneration factors, degrees of task delegation, provide good work-life balance, human relations, occupational health and other non-monetary remuneration factors [9–18].In this study, the needs of general practitioners were fully considered, and the incentive measures concerned by general practitioners were analyzed based on the results of incentive effects. Jiangsu Province, a relatively developed province in China, was selected for the study to explore the factors affecting the incentive effects of general practitioners, and the effect of incentive measures was reasonably evaluated.

## **2. Methods**

### *2.1 Study Samples*

From April to May, 2020, general practitioners from primary medical institutions in Jiangsu Province were investigated. Located in southeast coast of China, Jiangsu province has the second highest GDP among all the provinces in mainland China. Jiangsu province has 13 cities [19, 20]. In recent years, Jiangsu province has attached great importance to the establishment of the general practitioner system and issued various documents on the incentive mechanism of general practitioners for many times.

In the design of the study, logistic regression was intended to use to analyze the incentive effect, so the sample size was determined to be about 50 times of the independent variable, thus 900 general practitioners working in primary medical institutions in Jiangsu province were expected to be investigated [21]. From April to May 2020, 10 primary medical institutions were randomly selected from each of the 13 cities divided into districts in Jiangsu Province to conduct a survey. The respondents were all general practitioners who had worked in the hospital for at least 1 year.

### *2.2 Variable Definition*

The self-made questionnaire was used in this survey (questionnaire is shown in appendix). The measurement of incentive effect including job satisfaction, willingness to work hard and turnover intention. The indicator of incentive effect pays attention to general practitioners' own motivation feeling, avoiding the use of performance alone, which is easily affected by multiple factors. Job satisfaction was measured by Cammann job satisfaction Scale (5 questions, Cronbach's  $\alpha = 0.740$ ). Willingness to work hard was measured by TRAAM scale (4 questions, Cronbach's  $\alpha = 0.905$ ), and turnover intention was measured by Mobley turnover intention scale (5 questions, Cronbach's  $\alpha = 0.822$ ) [22–24]. The job satisfaction scale, willingness to work hard and turnover intention scale are all Richter five scales. The overall incentive effect was measured from three dimensions: job satisfaction, willingness to work hard and turnover intention. The total Cronbach's  $\alpha$  of the incentive effect scale was 0.910.

The study assumed that factors that may influence the incentive effect include: age, gender, marital status, educational background, years of working as a general practitioner, average monthly income, weekly working hours, daily sleeping duration, and physical exercise frequency. Age is a continuous variable. We classified Gender as being either "male" or "female", marital status was classified as "unmarried", "married" or "widowed/divorced, etc.". Educational background was classified as "junior college", "Undergraduate", "Master" or "Doctor". The years of working as a general practitioner was classified as "5 years and below", "6–10 years", "11–20 years" or "21 years and above". Average monthly income was classified as "3,000 Chinese yuan and below", "3,001–4,500 Chinese yuan", "4,501–6,000 Chinese yuan" or "6,001 Chinese yuan and above". Weekly working hours was classified as "40 hours and below", "40.1–45 hours", "45.1–50 hours" or "50.1 hours and above". Daily sleeping duration was classified as "6 hours or less", "6.1–7 hours", "7.1–8 hours" or "8.1 hours or more". Physical exercise frequency was classified as "once a month or no", "several times a month", "several times a week" or "every day".

### *2.3 Data Collection*

We adopted the method of chance sampling, and the questionnaire was filled by electronic link. 7 general practitioners (130\*7 = 910 general practitioners) were investigated in each hospital, and the number of rejected general practitioners was counted. A total of 837 valid questionnaires were recovered, with an effective recovery rate of 91.98%.

### *2.4 Statistical Analysis*

After collecting the questionnaire data and recalculating the reverse scoring questions, the reliability of each dimension of incentive effect and incentive effect scale was calculated. Then, the scores of each dimension are calculated to calculate the average scores of job satisfaction (5 questions), willingness to work hard (4 questions), turnover intention (5 questions) and overall incentive effect (14 questions in total). The outcome variable with each mean score  $\geq 3$  points was defined as 1, and the outcome variable with  $< 3$  points was defined as 0.

Independent variable, categorical variable was assigned, such as gender (female = 0, m = 1), marital status (single = 1, married = 2 widowed, divorced = 3). Rank variable such as educational background, years of working as a general practitioner, average monthly income, weekly working hours, daily sleeping duration, and physical exercise frequency coded in the order level.

After completion of coding, forward: LR method was used for binary logistic regression analysis. OR value and the 95% confidence interval between OR value was calculated.

### 3. Results

Demographic characteristics, occupational characteristics and behavioral habits of general practitioners in primary medical institutions were shown in Table 1. The results of the binary Logistic regression analysis of the three dimensions and incentive effect were shown in Table 2.

In this study, binary logistic regression was used to evaluate the influences of age, gender, marital status, educational background, years of working as a general practitioner, average monthly income, weekly working hours, daily sleeping duration, and physical exercise frequency. on job satisfaction, willingness to work hard, the turnover intention, and overall incentive effect of the study samples. The box-Tidwell method is used to verify whether the transformation value between the continuous independent variable and the dependent variable is linear or not. The linear test results show that there is a linear relationship between all the continuous independent variables and the dependent variable. The multicollinearity test between all independent variables and dependent variables shows that there is no multicollinearity relationship.

Finally, the four Logistic models obtained were statistically significant. Model A ( $\chi^2 = 23.160$ ,  $P < 0.001$ ) can correctly classify 86.0% of the samples (Table 2, Model A). Among the independent variables included in the model, age, weekly working hours and daily sleeping duration were statistically significant. For every 1 year increase in age, job satisfaction increases by 0.45%. For every unit increase in weekly working hours, job satisfaction decreases by 22.6%. For every unit increase in daily sleeping duration, job satisfaction increases by 1.401 times. Model B ( $\chi^2 = 34.345$ ,  $P < 0.001$ ) can correctly classify 86.4% of the samples (Table 2, Model B). Among the independent variables included in the model, weekly working hours, daily sleeping duration and physical exercise frequency were statistically significant. For every unit increase in weekly working hours, willingness to work hard decreases by 23.1%. For every unit increase in daily sleeping duration, willingness to work hard increased by 46.4%. For each unit increase in the physical exercise frequency, willingness to work hard increased by 1.568 times Model C ( $\chi^2 = 18.718$ ,  $P < 0.001$ ) was able to correctly classify 85.4% of samples (Table 2, Model C). Among the independent variables included in the model, age, weekly working hours and daily sleeping duration were statistically significant. For every 1 year increase in age, the tendency to turnover decreases by 0.36%. For every unit increase in weekly working hours, the tendency to turnover increased by 25.6%. For each unit increase in daily sleeping duration, the tendency of turnover decreased by 27.9%. Model D ( $\chi^2 = 21.743$ ,  $P < 0.001$ ) can correctly classify 83.5% of the samples (Table 2, Model D). Among the independent variables

included in the model, weekly working hours, average monthly income and years of working as a general practitioner were statistically significant. For each unit increase in working hours per week, the overall incentive effect decreases by 26.2%. For every unit increase in average monthly income, the overall incentive effect increases by 1.220 times. For every unit increase in average monthly income, the overall incentive effect increases by 40.4%.

## 4. Discussion

In our study, we studied general practitioners in primary medical institutions in Jiangsu Province, and distinguished the different feelings of general practitioners with different social demographic characteristics and living habits in terms of job satisfaction, willingness to work hard, turnover intention and overall incentive effect. The study found that with the increase of age, the decrease of working hours per week, the increase of sleeping hours per day, the increase of physical exercise frequency, the increase of average monthly income and the increase of working years of general practitioners, the turnover tendency of general practitioners in primary medical institutions decreased, and the job satisfaction, willingness to work hard and overall incentive effect increased.

At present, foreign general practitioners also face a series of problems, such as a large shortage in the number of general practitioners and a reluctance to go to rural areas [13, 15–17]. Other studies have shown that reduced exercise and poor lifestyle habits can lead to severe burnout among physicians [25]. Our study also confirmed that factors such as physical exercise and sleep duration could significantly influence the incentive effect of general practitioners. Meanwhile, this study also found that, different from general practitioners, the years of general practitioners' working experience was also one of the important factors influencing the incentive effect.

In recent years, the Chinese government has attached great importance to the construction of the general practitioner system. The State Council, the National Health Commission and other relevant ministries and commissions have successively issued a series of important documents, making a top-level design for the general practitioner system. As the focus of the new medical reform, the construction of general practitioners has drawn the attention of the central and local governments at all levels. Therefore, in the basic medical and health services standardization construction, the Chinese government implemented sufficient funds and policy, so this study found that the influence of the average income level is not obvious. The result shows that in recent years, the Chinese government pay more attention to improving the general practitioner salary.

In spite of the continuous improvement of the salary of general practitioners in China, we find that in addition to the salary, the non-material incentive becomes a more decisive factor affecting the incentive effect of general practitioners [18]. In our study, we found that general practitioners with longer working years have better overall incentive effect, indicating that after accumulating a lot of work experience, this group has a strong sense of responsibility, is more adaptable to the working conditions of the work unit, has a lower turnover intention, and can adjust their mentality and expectations well. Therefore, this study

suggests that general practitioners in primary medical institution should be given more care, and we should pay attention to non-material incentives, which can better stimulate the working motivation of general practitioners.

At the same time, this study suggests that general practitioners who develop good living habits, especially those who take regular physical exercise and have sufficient sleep time have lower turnover tendency, higher job satisfaction, and higher willingness to work hard. Having a healthy body can effectively improve work efficiency and work enthusiasm, so as to provide better health services for others. Primary medical institutions can organize recreational and sports activities according to the situation, which can effectively help general practitioners regulate their emotions, reduce their turnover intention, and improve their job satisfaction and willingness to work hard, so as to achieve the purpose of motivating general practitioners.

There were some limitations to this study. First, this study samples was determined mainly by Medical Doctor Association of Jiangsu province. During the conduction of survey, questionnaire was issued to each hospital by general practice association of Jiangsu province. Several hospitals may not cooperate with general practice association. Meanwhile the samples of this study are general practitioners in Jiangsu province, but Jiangsu province may do not completely consistent with other provinces, so there may be a selection bias. Moreover, our study is a cross-sectional study, unable to conduct a follow-up survey on the subjects. It is not yet possible to sort out the changes in the incentive effect of general practitioners after the introduction of relevant policies in recent years, and it is also not possible to conduct follow-up studies because of anonymous filling. Finally, the measurement of incentive effect in this study is mainly based on the general practitioners' own feelings, focusing on the motivation of general practitioners, without considering economic factors such as performance. In the future, external economic indicators can be appropriately added to verify the existing results.

## 5. Conclusion

We found that the government of Jiangsu province and the Chinese government have put a lot of efforts into the general practitioner system and achieved some results. In the later stage, the use of non-material incentive measures can be appropriately increased, especially the measures such as reducing the working hours per week, increasing the sleeping hours per day and increasing the frequency of physical exercise, which can help general practitioners to establish good living habits and significantly improve the incentive effect of general practitioners in Jiangsu Province.

## Abbreviations

CI: Confidence interval; GP: General practitioner; OR: Odds ratio

## Declarations

## Ethical approval and consent to participate

Ethical approval to conduct this study was obtained from the Nanjing Medical University Ethics Committee. Verbal consent was obtained during the study. The participants were informed directly by the first investigator about the content of the study. The respondents participated in study were voluntarily and their answers would be treated confidentially. Meanwhile, answering the questionnaire was anonymous to everyone except the research group. This study has been approved by the IRB of the First Affiliated Hospital of Nanjing Medical University.

## Consent for publication

Not applicable.

## Availability of data and materials

The data that support the findings of this study are available from the corresponding author on request.

## Competing interest

The authors declare no conflicts of interest.

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## Authors' contributions

LWN is responsible for the data analysis and writing the article. ZX is responsible for the data collection and analysis of the article. TDL is responsible for the writing of the article. ZBH is responsible for the design and modification of the article. ZYY is responsible for the overall design and modification of the article. All of the authors read and approved the final manuscript.

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## Appendix

### Questionnaire on the incentive status of general practitioners

Dear general practitioner

Thank you for your participation in this survey.

In 2018, the State Council issued the "opinions on reforming and improving the incentive mechanism for the training and use of general practitioners", emphasizing the important role of general practitioners in the realization of "Healthy China 2030 plan". The purpose of this survey is to understand the incentive status of general practitioners, analyze and summarize the key incentive factors, so as to further improve and optimize the incentive system of general practitioners. This survey is anonymous and will not have any impact on you and your hospital. Please choose or fill in the corresponding position according to the actual situation or your personal experience. We will strictly keep the information you provide confidential. This survey is based on the key projects of Jiangsu social science foundation. Please fill in or tick "√" according to your actual situation. Thank you for your support and cooperation! I wish you success in your work! Everything goes well!

### Section 1 Incentive effect

There are 13 item descriptions in this section. Please choose the appropriate options according to the following description and your satisfaction with the actual situation. Please choose as accurately and objectively as possible.

1 – totally disagree 2 – mainly disagree 3 – General 4 - mainly agree 5 - totally agree

<b>job satisfaction</b>					
1 Most of the time, I am enthusiastic about my work.	1	2	3	4	5
2 I'm quite satisfied with my present job.	1	2	3	4	5
3 I can find real pleasure in my work.	1	2	3	4	5
4 I feel like I can't make it to the end every day at work.	1	2	3	4	5
5 I find my job unpleasant.	1	2	3	4	5
<b>willingness to work hard</b>					
6 I feel a burst of energy when I'm working.	1	2	3	4	5
7 Even if I feel tired at work, I can recover quickly.	1	2	3	4	5
8 I think the purpose of my work is clear and meaningful.	1	2	3	4	5
9 I'm proud of what I do	1	2	3	4	5
<b>turnover tendency of general practitioners</b>					
1 I feel like I can't leave this job	1	2	3	4	5
2 I don't think about leaving my current unit	1	2	3	4	5
3 I plan to have a long-term career development in this hospital.	1	2	3	4	5
4 I often feel tired of my present job and want to change to a new hospital.	1	2	3	4	5
5 In the next six months, I will probably leave my current hospital.	1	2	3	4	5

## Section 2 Basic information

1. which city in Jiangsu province where you work: 1-suzhou 2-changzhou 3-wuxi 4-zhenjiang 5-nanjing 6-nantong 7-yangzhou 8-taizhou 9-huaian 10-suqian 11-lianyungang 12-xuzhou 13-yancheng

2. gender: male female

3. age: (years old)

4. marriage: unmarried unmarried widowed/divorced, etc.

5. education background: Junior college or below undergraduate master doctor
6. work style: staff doctors contract doctors else
7. Years of Working as a General Practitioner: 10 years and below 11–20 years 21 years and above
8. Average monthly income: 3,000 Chinese yuan and below,  3,001–4,500 Chinese yuan, 4,501-6,000 Chinese yuan 6,001 Chinese yuan and above
9. Weekly working hours: 40 hours and below 40.1–45 hours 45.1–50 hours 50.1 hours and above
10. Daily sleeping duration: 6 hours or less 6.1-7 hours 7.1-8 hours 8.1 hours or more
11. Physical exercise frequency: once a month or no several times a month several times a week every day

## Tables

Table 1  
Basic Information of Respondents

characteristic	classification	frequency(n)	percentage(%)
Gender	Male	368	44.0
	Female	469	56.0
Marital Status	Unmarried	706	84.3
	Married	113	13.5
	Widowed/Divorced, etc.	18	2.2
Educational background	Junior College	191	22.8
	Undergraduate	638	76.2
	Master	8	1.0
	Doctor	0	0.0
Years of Working as a General Practitioner	5 years and below	434	32.4
	6–10 years	728	54.3
	11–20 years	70	5.2
	21 years and above	0	0.0
Average Monthly Income	3,000 Chinese yuan and below	60	7.2
	3,001–4,500 Chinese yuan	135	16.1
	4,501-6,000 Chinese yuan	254	30.3
	6,001 Chinese yuan and above	388	48.4
Weekly Working Hours	40 hours and below	91	10.9
	40.1–45 hours	252	30.1
	45.1–50 hours	237	28.3
	50.1 hours and above	257	30.7
Daily Sleeping Duration	6 hours or less	174	20.8
	6.1-7 hours	491	58.7
	7.1-8 hours	148	17.7
	8.1 hours or more	24	2.9

<b>characteristic</b>	<b>classification</b>	<b>frequency(n)</b>	<b>percentage(%)</b>
Physical Exercise Frequency	Once a Month or No	282	33.7
	Several Times a Month	258	30.8
	Several Times a Week	206	24.6
	Every Day	91	10.9

Table 2

Logistic Regression Analysis of Incentive Effect of general practitioners in Primary Medical Institution  
(95% Confidence Interval of OR Value)

Variable	Model A	Model B	Model C	Model D
Age	1.045(1.020,1.071)	-	0.964(0.942,0.987)	
Weekly Working Hours	0.774(0.627,0.954)	0.769(0.622,0.950)	1.256(1.024,1.541)	0.738(0.608,0.896)
Daily Sleeping Duration	1.401(1.037,1.892)	1.464(1.077,1.991)	0.721(0.538,0.967)	
Physical Exercise Frequency	-	1.568(1.254,1.961)	-	
Average Monthly Income	-	-	-	1.220(1.007,1.480)
Years of Working as a General Practitioner	-	-	-	1.404(1.099,1.793)

\* The dependent variable of model A is the outcome variable of job satisfaction (0- low job dissatisfaction, 1- high job satisfaction). The dependent variable of model B is the outcome variable of willingness to work hard (0- low willingness to work hard, 1- high willingness to work hard); The dependent variable of model C is the outcome variable of turnover tendency of general practitioners (0- tends not to turnover, 1- tends to turnover); The dependent variable of model D is the outcome variable of the overall incentive effect (0- incentive effect is bad, 1- incentive effect is good).

Age is a continuous variable. We classified Gender as being either "male" or "female", marital status was classified as "unmarried", "married" or "widowed/divorced, etc.". Educational background was classified as "junior college", "Undergraduate", "Master" or "Doctor". The years of working as a general practitioner was classified as "5 years and below", "6-10 years", "11-20 years" or "21 years and above". Average monthly income was classified as "3,000 Chinese yuan and below", "3,001-4,500 Chinese yuan", "4,501-6,000 Chinese yuan" or "6,001 Chinese yuan and above". Weekly working hours was classified as "40 hours and below", "40.1-45 hours", "45.1-50 hours" or "50.1 hours and above". Daily sleeping duration was classified as "6 hours or less", "6.1-7 hours", "7.1-8 hours" or "8.1 hours or more". Physical exercise frequency was classified as "once a month or no", "several times a month", "several times a week" or "every day".

"-" means that the OR value of this variable is not statistically significant in this model ( $P > 0.05$ ), and it is not shown in the table of variables with no statistical significance in all the four models.