



# Broadening the Role of General Practitioners (GPs): A Survey Examining Clinicians' Perceptions of General Practice Education and Training in China

Zhou F<sup>1</sup>, Chi C<sup>2</sup>, Mai X<sup>1</sup>, Liang J<sup>1</sup>, Zhang X<sup>1</sup>, Hu X<sup>1</sup>, Zhang K<sup>1</sup> and Xu D<sup>2,3\*</sup>

<sup>1</sup>Department of General Medicine, The Third Affiliated Hospital of Sun Yat-Sen University, China

<sup>2</sup>Department of Health Sciences, Curtin University, Australia

<sup>3</sup>Department of Medical Education & General Practice, The First Affiliated Hospital of Sun Yat-Sen University, China

## Abstract

**Objective:** Objective to learn about clinicians' understanding of the role of the general practitioner so as to explore the methods and strategies for improvement of general practice education and training.

**Materials and Methods:** A questionnaire was designed and randomly distributed to participating representatives of General Practice Branch of Guangdong Provincial Medical Association and then forwarded by the representatives to participating clinicians between December 27<sup>th</sup>, 2017 and January 15<sup>th</sup>, 2020. A total of 1,022 completed questionnaires were collected. The main contents of the questionnaires included demographic information of the participants, their understanding of the General Practitioners' (GPs) role, and suggestions for education and training in general practice. The questionnaire results were derived by EXCEL, and its descriptive statistical analysis and chi-square test were performed by using SPSS 22.0 statistical software.

**Results:** A total of 1022 people participated in the survey and completed the questionnaire. 87.4% of them believed that general practice should be established as an undergraduate course. Those who understood the current training model of GPs accounted for 50.9%, and those who had participated in general practice teaching, outpatient service, or teaching accounted for 62.6%. More than 70% of the respondents understood the responsibilities of GPs and the ongoing clinical relationship between GPs and the specialist. 93.3% of the interviewees thought that the diagnosis, treatment, and counseling of mental illness was one of the skills that GPs should master. Among the respondents who are GPs or GP trainees, 35.8% have significant concerns about the country's policies and support systems for GPs. 10.9% of the respondents believed that support for GPs should be improved to include career promotion opportunities and specific salaries agreements, while 5.2% of the respondents believed that social recognition of GPs should be enhanced through policy development and public education. 80.6% of the respondents said they trusted the competency of their current GPs.

**Conclusion:** Further recognition of general practice as a medical specialty is required, and the education and training models of GPs is highly recommended to start from the implementation of formal GP curriculum in the undergraduate course. In order to improve the service quality of GPs, there must be an increase in the number of competent GPs. We believe that it can be achieved through policy development and support for promotion of GP training and education. In addition, most medical staff agreed that the diagnosis and treatment of mental illness should be an essential skill for GPs' holistic and quality service.

**Keywords:** Community medicine, Family medicine, General Practice Training and education

## Introduction

General practice medicine is a comprehensive medicine for community and family, integrating clinical medicine, medical ethics, preventive medicine, rehabilitation medicine, and humanities and social sciences. General practice medicine was initially viewed not only as the undifferentiated bulk of general medicine, but also as an independent clinical discipline with its unique intellectual

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### \*Correspondence:

Xu D, Department of Medical Education & General Practice, The First Affiliated Hospital of Sun Yat-Sen University, China, Tel: 61-415288896;

E-mail: daniel.xu@curtin.edu.au

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contents. The recognition of Family Medicine or General Practice Medicine as a specialty appeared in the 1960s and spread to North Americas, European countries, Asia and Pacific regions in the 1970s [1]. The landmark development of officially recognizing general practice as a specialty was in the hands of Family Doctor Charter in 1966, around which satisfied the career aspirations of many United Kingdom general practitioners [2]. The Family Doctor Charter officially declared for the ideological independence of a new college, the Royal College of General Practitioners (RCGP), which was founded in late 1952. The Family Charter drew up its inaugural curriculum on general practice postgraduate training in 1965, entitled "Special Vocational Training for General Practice" [3]. The USA Millis Commission Report in 1966 entitled "The Graduate Education of Physicians" officially recommended specific postgraduate training for all Primary Care physicians, with the creation of a theoretical body on holistic health care and emphasis on out-of-hospital training [4]. General Medicine or Family Medicine Departments were established in medical schools in the ensuing years with comprehensive undergraduate training programs. Family medicine became an official specialty in 1968 certified by the American Board of Family Practice being declared as the official certification body, which was formally established in 1969. Ian Mc Whinney was appointed the first Professor of Family Medicine in Canada at the University of Western Ontario in 1967 and is considered to be the leading theorist in general practice with his book entitled "The Origins of Family Medicine" [5]. His book defined general practice as a new discipline with a unique body of knowledge and specific clinical skills that were capable of supporting research and possessing their own philosophy. The defining moment of general practice medicine came from the Alma-Ata Conference in 1978 declaring that Primary Care has now become the preferred working environment for family doctors as a team and for a defined community [6]. The title of "General Practice" is a unique clinical discipline, covering all ages, genders, and systemic diseases with emphasis on the importance of patient-centered and family-centered long-term comprehensive services to promote the health of the population. In comparison to the half-a-century general practice service and well-established general practice education and training, general practice in China has a relatively late start. Since the introduction of general practice medicine at the First International General Medicine Conference in Beijing in November 1989 [7,8]. China has made steady progress in reforming community medical and health services with establishment of a network of health services to accommodate the different locations of its residents through general practitioners [7,8]. There are still academic and service gaps of general practice including clinical service, education and training. General Practitioners (GPs) in China are currently trained only at postgraduate level through general medicine to provide general medical services. The Healthy China Action Plan (2019-2030) is promoting the management of chronic diseases, advocating early prevention and early treatment, promoting the development of primary medical care, relieving the medical pressure on secondary and tertiary hospitals, and improving hierarchical system treatment. The government support of general practice with the education and training of GPs is the cornerstone of the successful promotion of general practice as an officially recognized specialty in health care. The purpose of this study is to investigate clinicians' perceptions of general practice and their recommendations of how GPs should be trained to become a competent clinician.

## Materials and Methods

### Survey participants

The participants were mainly representatives from General Practice Branch of Guangdong Provincial Medical Association, including clinicians nominated by the representatives. A total of 1,022 participants aged 21 to 60, included clinicians, postgraduate students in clinical medicine, and trainee GPs.

### Survey design and assessment tool

The questionnaire was designed by the department of general medicine and forwarded to the respondents from December 27<sup>th</sup>, 2010, to January 15<sup>th</sup>, 2010. The questionnaire mainly included:

1. The demographic information of the respondents, including gender, age, educational level, occupation, city, employment, and contact information;
2. Understanding of general practice training, including whether the respondent had studied general practice medicine, whether general practice medicine courses should be offered at the undergraduate level, whether the respondent understood the training model of GPs in China, whether the respondent had participated in general practice related courses, outpatient or teaching, and whether it was necessary to establish department of general practice in tertiary hospitals;
3. Understanding the clinical services of general practice, including what was the most important role for general practice in tertiary teaching hospitals, the relationship between general practice medicine and various specialties, whether the respondent understood the public health and basic medical service content provided by the community health service centre for community residents, the three most important clinical service provided by GPs in community hospitals, the three most commonly-managed clinical problems at the clinics, what patients with what problems were most suitable for GP clinic, and whether GPs should be trained to have the clinical skills in diagnosing and treating mental illness;
4. Advocate for general practice, including working as a GP, ensuring patients' level of trust in GPs, what three important calibers are needed to be a competent GP, what is the biggest concern of working as a GP or being a GP trainee.
5. Any suggestions for China's current policy of GP education and training, and the current status of general practice service in China.

### Statistical analysis

EXCEL was used to export statistical data, and SPSS 22.0 statistical software was used to conduct descriptive statistical analysis and chi-square test on the data.

## Result

### Demographic information of the respondents

Among the 1,022 respondents, 88.6% were from Guangdong province, 7.3% were from Fujian province, 1.4% were from Beijing, and 0.5% were from Zhejiang, Jiangxi and Guangxi provinces respectively. The other 0.2% were from Xinjiang, Hunan, Ningxia, Sichuan, or Inner Mongolia provinces. Those who were from Guangzhou accounted for 63.4% of Guangdong province, while Dongguan accounted for 9.4%. Among them, males accounted for 44.8%, aged between 21 to 60 years old, with an average age of 36.0

**Table 1:** Demographic information of the respondents.

| Basic information                    | Number of cases | Constituent ratio (%) |
|--------------------------------------|-----------------|-----------------------|
| <b>Sex</b>                           |                 |                       |
| Male                                 | 458             | 44.8                  |
| Female                               | 564             | 55.2                  |
| <b>Age</b>                           |                 |                       |
| 21-29                                | 216             | 21.1                  |
| 30-39                                | 541             | 48.3                  |
| 40-49                                | 240             | 23.5                  |
| 50-60                                | 25              | 2.4                   |
| <b>Educational background</b>        |                 |                       |
| Senior high School/Vocational school | 27              | 2.6                   |
| Junior college                       | 121             | 11.8                  |
| Undergraduate degree                 | 590             | 57.8                  |
| Master's degree                      | 225             | 22                    |
| Doctorate                            | 59              | 5.8                   |
| <b>Occupation</b>                    |                 |                       |
| Specialist physician                 | 276             | 27                    |
| General practitioner                 | 465             | 45.5                  |
| Nurse                                | 136             | 13.3                  |
| Medical technician                   | 83              | 8.3                   |
| Hospital administrator               | 25              | 2.4                   |
| Undergraduate medical student        | 10              | 0.9                   |
| Postgraduate medical student         | 27              | 2.6                   |
| <b>Work unit</b>                     |                 |                       |
| Community Centre                     | 417             | 40.8                  |
| Local hospital                       | 85              | 8.3                   |
| Secondary hospital                   | 70              | 6.9                   |
| Tertiary hospital                    | 450             | 44                    |

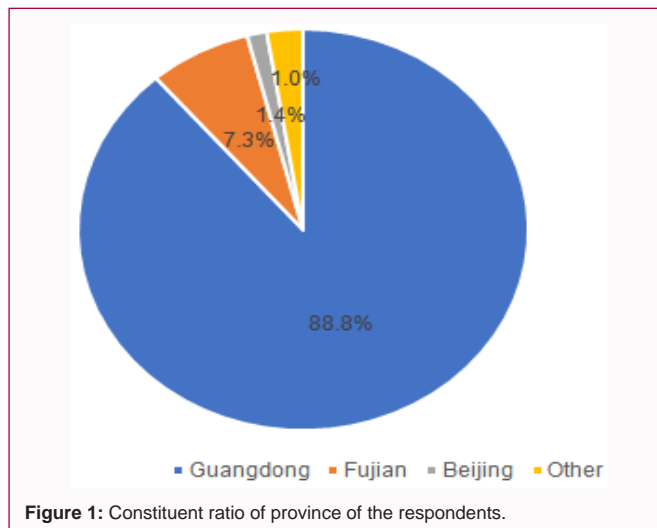
± 7.8 years old. Most of them had bachelor's degree, accounting for 57.8%, mainly specialized as a physician (27.0%), or were GPs (45.5%). They mainly worked in community medical and health service centers and tertiary hospitals, accounting for 41.7% and 43.1% respectively (Table 1 and Figure 1, 2).

**Respondents' understanding of general practitioners' training**

Among the respondents, those who had background in general medicine accounted for 26.5%, while those who considered general practice should be taught and learned during an undergraduate degree accounted for 87.4%. The number of people who know but do not understand the training model of a GP was almost evenly split. Those who had participated in teaching of general medicine or outpatient service accounted for 62.6%. Those who considered the general practice department should be set in grade-three hospitals accounted for 87.7% (Table 2).

**Respondents' understanding of the service of general practice**

Among the respondents, 94.5% thought that the most important task for GPs in tertiary hospitals was ward management of patients with common diseases and chronic diseases. As for the relationship between general practice and specialties, 73.2% of the respondents



**Figure 1:** Constituent ratio of province of the respondents.

**Table 2:** Respondents' understanding of general practitioners' training.

| Understanding of general practitioners' training  | Number of cases | Constituent ratio (%) |
|---|-----------------|-----------------------|
| <b>Have you studied general practice?</b>   |                 |                       |
| Yes   | 752             | 73.5                  |
| No  | 270             | 26.5                  |
| <b>If general practice medicine should be taught and learned during an undergraduate degree</b> |                 |                       |
| Yes   | 893             | 87.4                  |
| No  | 129             | 12.6                  |
| <b>Whether respondents understood the general practice training model</b>                       |                 |                       |
| Yes   | 520             | 50.9                  |
| No  | 502             | 49.1                  |
| <b>Whether grade-three hospitals should set up general practice departments</b>                 |                 |                       |
| Yes   | 896             | 87.7                  |
| No  | 126             | 12.3                  |
| <b>Have you ever participated in general practice teaching or outpatient service?</b>           |                 |                       |
| Yes   | 640             | 62.6                  |
| No  | 382             | 37.4                  |

thought that the two were equal and collaborative, while none of them thought that the two have their own opinions and do not interfere with each other. 75.8% of the respondents understood the importance of disease prevention and basic medical services provided by community medical and health service centers for community residents in China, while only 32.5% believed that the most important and relevant service provided by GPs in community hospitals was the management of chronic diseases (Table 3).

**Survey results from respondents regarding general practice as a whole**

Among the respondents, 54.7% were GPs and GP trainees, 35.8% were most concerned about current policies for education, training and employment conditions. 80.6% of the respondents said they trusted their current GPs. 32.8% believed that constantly updating clinical knowledge was the most important caliber for GPs to master. In terms of the most common diseases managed by GPs in their daily practices, hypertension was the most commonly managed diseases encountered by 39.1% of the respondents and acute upper respiratory infection was considered the 3<sup>rd</sup> most common disease

**Table 3:** Respondents' understanding of the service of general practice.

| Understanding of the service of general practice   | Number of respondents | Constituent ratio (%) |
|--|-----------------------|-----------------------|
| <b>Relationship between general practice and specialties</b>   |                       |                       |
| General practice covers all specialties  | 203                   | 19.9                  |
| They don't interfere with each other   | 0                     | 0                     |
| General practice is just a supplement of specialist  | 71                    | 6.9                   |
| General practice and specialist departments collaborate equally  | 748                   | 73.2                  |
| <b>Are you familiar with the disease prevention and basic medical services provided by community hospitals in China?</b> |                       |                       |
| Yes  | 775                   | 75.8                  |
| No   | 247                   | 24.2                  |
| <b>The most important &amp; relevant service provided by GPs in primary community medical service centre</b>             |                       |                       |
| Management of chronic diseases   | 332                   | 32.5                  |
| Diagnosis and treatment of common and frequently occurring diseases  | 151                   | 14.8                  |
| Health care for the elderly, children, and women   | 272                   | 26.6                  |
| The family doctor signs up for home visits   | 87                    | 8.5                   |
| Hospice care and hospice services  | 51                    | 5                     |
| Community health knowledge promotion   | 5                     | 0.5                   |
| Identification and referral of critical illness  | 10                    | 1                     |
| Early screening of malignancy  | 24                    | 2.3                   |
| Mental health consult education and training   | 18                    | 1.8                   |
| Others   | 72                    | 7                     |

by 29.4% of respondents. Diabetes was regarded by 35.8% of the respondents as the 2<sup>nd</sup> most common disease in outpatient service. 55.2% of the respondents believed that patients with chronic diseases should most often seek treatment in general practice. 93.3% of the respondents thought that the diagnosis, treatment, and consultation of mental illness were essential clinical skills for GPs. In terms of current policy and protocol for GP education and training, 29.6% of the respondents believed training should be emphasized in general medicine with more opportunities for education and training. The evaluation model for GPs should be academically designed with focus on the standardization of clinical training including the capacity build-up in teaching and scientific research. 48.1% thought that GPs should be given promotion opportunities and specifically-designed remuneration. In addition, 5.2% of the respondents believed that GPs should be recognized by the public through updating government policies and public awareness education about the roles of GPs (Table 4).

The effects of whether respondents learned general practice medicine during their undergraduate studies or not on the understanding of general practice.

By chi-square test, whether the respondent learned general practice medicine during their undergraduate studies or not was irrelevant to their understanding of general practice and specialties relationship, and trust of GPs ( $P>0.05$ ). However, it was relevant to the understanding of public health and preventive medical service provided by community health service centers for community residents in our country ( $P<0.05$ ) (Table 5).

## Discussion

General practice literature was introduced into the Chinese literature to indicate its origin in the late 1960s in the western world,

**Table 4:** Comments & Opinions from respondents for GP as a profession.

| Questions & Answers for general practice  | Number of cases | Constituent ratio (%) |
|---|-----------------|-----------------------|
| <b>Are you a general practitioner?</b>  |                 |                       |
| Yes   | 559             | 54.7                  |
| No  | 463             | 45.3                  |
| <b>Do you trust current general practitioners?</b>  |                 |                       |
| Yes   | 824             | 80.6                  |
| No  | 198             | 19.4                  |
| <b>Which aspect is the most important for general practitioners to improve?</b>   |                 |                       |
| Updated clinical knowledge  | 336             | 32.8                  |
| Common procedure skills   | 138             | 13.5                  |
| Sense of identity for their job   | 208             | 20.4                  |
| Concept of general care   | 158             | 15.5                  |
| Ability to communicate  | 28              | 2.7                   |
| Teaching ability  | 2               | 0.2                   |
| Scientific research ability   | 8               | 0.8                   |
| Numbers of practicing general practitioners   | 114             | 11.1                  |
| Public education of health care knowledge   | 20              | 2                     |
| Others  | 10              | 1                     |
| <b>If you were GPs or were GP trainees, what would be your most concern?</b>  |                 |                       |
| Acknowledgement from family, friends and peers  | 33              | 3.3                   |
| Patients' trust   | 162             | 15.8                  |
| Policies on remuneration  | 356             | 34.8                  |
| Sufficient clinical knowledge and skills  | 274             | 26.8                  |
| Scientific research and teaching ability  | 37              | 3.6                   |
| Future promotion opportunities  | 156             | 13.3                  |
| Others  | 24              | 2.4                   |
| <b>The most common diseases seen in the clinic</b>  |                 |                       |
| Acute upper respiratory tract infection   | 301             | 29.4                  |
| Hypertension  | 399             | 39.1                  |
| Diabetes  | 48              | 4.7                   |
| Others  | 274             | 26.8                  |
| <b>Which patients should be seen more often in general practice?</b>  |                 |                       |
| Elderly people with complicated conditions  | 71              | 6.9                   |
| Chronic disease patients  | 565             | 55.2                  |
| Those patients with mild disease  | 109             | 10.7                  |
| Do not know which department to triage  | 191             | 18.7                  |
| With many chief complaints  | 77              | 7.6                   |
| Others  | 9               | 0.9                   |
| <b>Whether general practitioners should have the ability to diagnose, treat and consult mental and psychological diseases</b> |                 |                       |
| Yes   | 954             | 93.3                  |
| No  | 68              | 6.7                   |

development into a specialty after the Second World War, and playing an important role as family doctors in the western health care system after many years [7]. By 2000 in the United States of America (USA), the number of family doctors was second to that of internal medicine doctors. It has a comprehensive education system and standardized training model in the USA and the rest of the western world, ensuring



**Table 5:** The effects of whether respondents learned general practice medicine during their undergraduate studies or not on the understanding of general practice.

| Understanding of general practice   | Have you learned general practice medicine during undergraduate studies |              | Total | χ <sup>2</sup> | P     | R     |
|---|---|--------------|-------|----------------|-------|-------|
|   | Yes   | No           |       |                |       |       |
| <b>Whether tertiary hospitals should set up general medicine/ practice departments</b>                              |   |              |       | 0.544          | 0.503 |       |
| Yes   | 222 (25.94%)  | 643 (74.05%) | 856   |                |       |       |
| No  | 51 (30.76%)   | 115 (69.23%) | 166   |                |       |       |
| <b>Relationship between general practice and specialties</b>  |   |              |       | 1.095          | 0.578 |       |
| General practice covers all specialties   | 90 (23.81%)   | 289 (76.19%) | 379   |                |       |       |
| They don't interfere with each other  | 0   | 0            | 0     |                |       |       |
| General practice is just a supplement of specialist   | 15 (20.69%)   | 55 (79.31%)  | 70    |                |       |       |
| General and specialised departments cooperate equally   | 208 (27.83%)  | 541 (72.16%) | 749   |                |       |       |
| <b>Are you familiar with the public health and basic medical services provided by community hospitals in China?</b> |   |              |       |                |       |       |
| Yes   | 228 (29.37%)  | 547 (70.62%) | 775   | 5.457          | 0.02  | 0.116 |
| No  | 44 (17.64%)   | 203 (82.35%) | 247   |                |       |       |
| <b>Do you trust current general practitioners?</b>  |   |              |       | 0.241          | 0.678 |       |
| Yes   | 223 (27.05%)  | 600 (72.94%) | 823   |                |       |       |
| No  | 46 (24.39%)   | 143 (75.61%) | 189   |                |       |       |

GPs to provide high-quality service [8].

Since the introduction of general practice medicine at the First International General Medicine Conference in Beijing in November 1989, China has made steady progress in reforming community medical and health services with establishment of a network of health services to accommodate the different locations of its residents. At present, China's general practice medical care mainly includes the community health service and general practice medicine supported by tertiary hospitals. As an expert generalist in dealing with complex and chronic-diseases patients, GPs are regarded as "gatekeepers" in initiating preventive and complex chronic-diseases care, diagnosis and treatment of common and frequently-presented diseases, referral, and continuous surveillance of foreseeable complications of chronic diseases. Recent studies indicated that GP plays a particularly important role in prevention of chronic disease complications due to its unique advantages of constantly providing holistic care [9]. A GP will require a comprehensive training to be competent of delivering holistic care to patients.

Since the 21<sup>st</sup> century, the number of training institutions for GPs in China has gradually increased. While the central government is promoting general practice medicine as the new strategic direction of health sector reform, there is an imminent need to improve the community medical service system, upgrade postgraduate medical education, and develop the novel training model for GPs in the Chinese context [10]. The most important theme of the education and training model for GPs should include the introduction of general practice as a formal curriculum into the undergraduate course. The medical graduate from their undergraduate studies with GP curriculum will gain a better understanding of general practice in terms of knowledge framework, nature of practice and the unique bio-psycho-social approach by GPs in their daily clinical practice. Thus, it will facilitate the consistency of education and training, ensuring the quality of teaching and learning, improving the teaching capacity of medical professionals. The current general practice education and training system has basically designed a general practice training model with five-years undergraduate course plus subsequent three-

years postgraduate GP-focus training called "5+3" main model as well as "3+2" supplement model in China. This training model has attracted an increasing number of medical graduates to enroll into GP training.

Since the establishment of general practice in the health sector, the CPC Central Committee has continuously issued new medical reform policies to guide the development of general practice with improvement of the triage and referral system. Governments at all levels have also invested various resources to build and strengthen general practice through the media to make the community fully aware of GPs' roles. Despite all these efforts, our online questionnaire survey of primary medical staffs in Guangdong province showed that most medical staffs did not understand the training model of general practice. The survey also pointed out that most medical staffs had a limited understanding with the concept of general practice and did not know the service scope of general practice. Therefore, the survey did highlight the need of improving the recognition of GPs from a holistic approach. If one would become a general practitioner, its policy priority with GP education and training should be recognition of GPs' role and standing in the health sector initially, followed by evaluation of clinical competency reflected by their knowledge and clinical skills. In a brief summary, most of the respondents in the survey suggested strengthening the training of GPs will require significant investment in general practice training through raising GPs' remuneration and academic promotion to attract more graduates careering in general practice.

Another interesting finding in this survey was that most of the respondents were aged between 30 to 49 years old, with a MBBS degree working in community centers or tertiary hospitals. Among them, 54.7% of the respondents worked as GPs, only 24.2% of the respondents had heard about and learned general practice medicine during their undergraduate studies, but nearly half of the respondents (49.1%) lacked an understanding of the general practice training model. About 12.3% of the respondents thought tertiary hospitals should not have a general practice department, while 19.4% of the respondents were still unable to trust GPs at the present stage. Thus,

it is obvious that understanding of general practice medicine and GPs by peers needs to be improved. To train more GPs, we need to tackle the fundamental problems faced by GPs. According to the survey, the most concerning problem for GPs and GP trainees were the development of the strategic policy to facilitate the training of a competent GP (35.8%). The second pressing issue will be the provision of GP training for ongoing clinical knowledge and skills upgrade, which the government needs to attract investments to support GPs' continuous professional development and the special training requirements.

Increasing the job satisfaction of GPs is conducive to increasing the number of qualified GPs. In a multi-centers qualitative study, researchers interviewed 183 GPs from eight European countries and found that there were five factors that could improve the job satisfaction of GPs. These included treating GPs as an individual human being, having special skills as a GP, good doctor-patient relationships, freedom of choice on working condition, and the ability to balance work and life [11]. To address the above five factors impacting GP job satisfaction in China require the government to place more resources in general practice education and training, and improve the public's understanding of GPs. A study in Hong Kong (HK) appeared to address the five factors, and showed that GPs were highly satisfied with their current training in family medicine [12]. In comparison with mainland China, the training of family physicians in HK is more flexible, systemically similar to the western countries, and has many years of experiences in general practice education and training. HK GP training system has always adopted the UK system with GPs being trained as "Gate keeper" of health care system. The teaching and learning for GP trainee focus on work-based assessment in OSCE style with various scenarios being closer to reality [13]. Therefore, in the recommendation for GP training with this survey, one would propose the HK training model of GPs in inland regions should adopt and modify the HK style in light of its positive outcome with GP career satisfaction and its cultural similarity. Recent research stated that the importance of the doctor-patient relationship was described as an effective factor in job satisfaction for the General Practice workforce [14-16]. We'll have an opportunity to extend our survey study to explore the doctor-patient relationship.

Another important point for GP service is to reduce job burnout. Western literature has shown that job burnout was very common among GPs, affecting the quality of GPs' provision of clinical services and hindering the increase in the number of medical graduates joining GP training [17]. The job burnout of GPs was mainly linked to quality and nature of the workload rather than quantity of the workload, which was commonly perceived. The quality and nature of the workload has become more complex involving patients with multiple chronic disease and complex mental health issues, which require time-consuming clinical services. The other major factors contributing to burnout include lack of relevant supportive resources and under-recognition from patients and peers. The lack of relevant supportive resources reflected the importance of policy design in the Chinese context with a sound and culturally-specific referral system. Increasing specialist-input resources is very important for GPs, whom are the most frequent users of the improved referral system. Some researchers proposed and concluded in a small study that enhancement of GPs' happiness might reduce the sense of job burnout by taking regular breaks at work like coffee breaks in the western culture, thus improving the sense of self and collective awareness of job burnout risk, and the quality of GP services [18].

Obviously in this survey, Chinese GPs relate their job satisfaction and happiness to the increasing recognition of their social status and professional achievement by their peers, the hospitals, the public, the governments and society as a whole. A recent cross-sectional analysis of Australian GPs using "Balancing Employment and Life (MABEL)" data examined GPs' 'non-billable workload' [19]. This analysis concluded that GPs' increasing amount of non-billable work may have profound impact on economic variability, GPs' workload and job satisfaction [19]. Our survey did examine policy on remuneration of GPs and it'll be important to broaden the survey to investigate potential 'non-billable workload' among Chinese GPs and its effects on workload, happiness and job satisfaction.

Increasing the role of GPs in the health-care system can significantly reduce the health care budget of health care system. GPs are "gatekeepers" to initially identify and treat patients in outpatient or emergency settings, provide continuity of preventive care and referral to specialists whenever there is a clinical need. A recent retrospective cohort study with GPs in Netherlands did demonstrate the saving of health care cost by reducing unnecessary specialist referral through continuity of care [20]. In this study, continuity of care with patient management was shown to be the cornerstone of primary health care, demonstrating continuity of care was negatively correlated with the referral rate in pediatrics, gastroenterology, ophthalmology and psychiatry [19], however positively correlated with increased referral rate in geriatrics, female and patients with more GP contact. The highlight has come from a more recent publication showing that continuity of care with GP management was negatively associated with frequency of specialist visitations [21]. Looking back to our survey, we did not examine "continuity of care", which is very important for the development of general practice and the improvement of the referral system in China. It'll be interesting to explore GPs' "continuity of care" in the Chinese context from both clinician and patient perspectives.

One of the important discussing points of this survey is about how to increase the number of medical graduates interested in GP training and joining the GP workforce. A recent national cross-sectional survey of UK postgraduate doctors indicated that medical graduates' original intention is a strong predictor of career specialty choice at the end of the relevant specialty curriculum education during the undergraduate course [22]. An analysis of undergraduate students' career intention showed that the medical curriculum could influence students' understanding of general practice, and their career choices to be GPs [23]. This study also showed that respondents who completed general practice medicine in their undergraduate curriculum had a more in-depth understanding of the settings required in general practice medicine departments in tertiary hospitals, the practical requirement of public health knowledge and basic clinical service provided by GPs at community health service centre for community residents [23]. Our survey echoed the findings of these studies that official establishment of general practice medicine curriculum in undergraduate course in China will be of benefit in improving recognition of general practice medicine by all clinical staff. Furthermore, it will be more conducive to medical students in choosing to apply for GP training after graduation, and attracting more talented graduates to become a competent GP, whom is most needed to relieve the clinical service overload of tertiary hospitals especially in the Chinese context.

Another interesting discussion point related to the establishment

of evidence-based GP curriculum for clinical placement training in the Chinese context. The daily GPs' consultations include the widest range of clinical problems in any specialty, which make it difficult for curriculum designer to construct an evidence-based and deliverable clinical placement training curriculum for GP trainees. The questions are raised in relations to what conditions should be included in the curriculum in clinical placements. An Australia study analyzed data from the Bettering the Evaluation and Care of Health (BEACH) program, which is an ongoing cross-sectional survey of general practice activity in Australia [24]. BEACH enrolls a new random sample of about 1000 GPs per year including GP's consultation details for 100 consecutive patient encounters [25]. Analysis of the Beach data indicated that top 10 most commonly managed problems in general practice were hypertension, immunization, upper respiratory tract infection, depression, diabetes, lipid disorder, general check-up, osteoarthritis, back complaint, and prescription request [24]. The top 30 problems accounted for approximately 48% of GP problems managed, while GPs need to have knowledge of more than 100 problems if they like to cover 75% of problems managed [24]. This BEACH data analysis has provided GP trainers evidence to design GP education and training in the clinical placement setting. The top 30 commonly managed problems have laid the foundation for trainers to deliver an evidence-based GP placement curriculum [24]. Our survey has initiated some preliminary work in establishing a similar database in one training centre. The most commonly managed problems in general practice medicine at our training centre are of mainly chronic diseases, including the top 3 of hypertension, diabetes, and acute respiratory infection. Our training centre is planning to collaborate with Australian University to continue this dataset collection to eventually develop an evidence-based training curriculum for GP education and training in China.

The final discussion point related to whether GPs should play a key role in the management of mental illness. The BEACH data analysis showed that depression was 4<sup>th</sup> commonly GP managed problem and accounted for significant portions of GPs' daily consultations [24]. Our survey indicated that 93.3% of the respondents believed the inclusion of education and training for GPs to diagnose, treat, and consult patients with mental illness, which is currently lacking. The education and training of managing mental illness in China should render GPs with the competence to manage chronic mental illness and diagnose acute mental condition before they refer patients to psychiatrists at psychiatric clinics in tertiary hospitals or mental health hospitals. Our survey strongly suggested that the concept of managing mental illness in general practice should be introduced into the undergraduate curriculum of general practice, general practice standard training curriculum or psychiatry undergraduate curriculum.

In conclusion, our survey indicated that general practice is under-recognized by all clinician respondents as well as a lower awareness by patient. Our study strongly suggested that further recognition of general practice as a medical specialty is required, and the education and training models of GPs is highly recommended to start from the implementation of formal GP curriculum in the undergraduate course. In order to improve the service quality of GPs, there must be an increase in the number of competent GPs. We believe that it can be achieved through policy development and support for promotion of GP training and education. In addition, most medical staff agreed that the diagnosis and treatment of mental illness should be an essential skill for GPs' holistic and quality service.

## Strengths and Limitations

This study's main limitation is the insufficient sample size, and most of them were general practitioners in Guangdong Province, which was only representative of the region. However the strength of this study is that most of the general practitioners who participated in the survey are working in general practice settings, demonstrating the true representation of the data in this study.

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