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Title: The public's views towards community health services and their utilization of community- and hospital-based outpatient services in Zhejiang province, China – A mixed methods study

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Abstract

Objective: China is engaged in promoting community health services (CHS) nationwide. This study examines the public's views towards CHS and their utilization of community- and hospital-based outpatient services.

Design: A mixed-methods study using individual interviews, focus group interviews and a cross-sectional survey.

Study setting and participants: The study was conducted among the general public between September 2014 and September 2015 in Zhejiang province, China. Six focus groups and thirteen individuals were interviewed. The questionnaire was completed by 1248 respondents (response rate: 83%).

Primary outcome measures: Utilization of community- and hospital-based outpatient services.

Results: Functions of CHS perceived by the public included provision of minor illness management, coordination, drug dispensing, follow-up care, and patient education. However, many also showed a distrust in general practitioners' (GPs) competence for confirming the initial diagnosis and management plan. As coordinators, GPs' integrity was challenged and GPs were thought to be potential "tuo er" (cunning agents who tried to lead patients to some notorious hospitals to make money).

Survey results showed that 800 (64.1%) respondents visited hospital-based clinics and 688 (55.1%) visited CHS at least once in the past year. Compared to the uninsured group, those who had some medical insurance were more likely to use hospital-based services (adjusted odds ratio or

AOR=1.58, 95%CI 1.06-2.37). Respondents who had a chronic condition were more likely than their counterparts to use both hospital-based services (AOR=1.76, 95%CI 1.22-2.54) and CHS

(AOR=1.68, 95%CI 1.20-2.34). Income levels were positively associated with the likelihood of visiting hospital-based clinics (AOR=1.80, 95%CI 1.25-2.58) but negatively associated with the likelihood of using CHS (AOR=0.67, 95%CI 0.48-0.95).

Conclusions: Both community- and hospital-based outpatient services are heavily consumed with the latter being used by more respondents. Policy reformers need to take further actions to address the public distrust in GPs to facilitate their gatekeeping role.

Strengths and limitations of this study

- Our qualitative part provided the in-depth views of service users towards the community health services.

- The quantitative data triangulated the qualitative findings using a follow up cross-sectional survey approach.

- The study mapped out the public's utilization of both community- and hospital-based outpatient services in a free market style healthcare system in the urban setting.

- The study was conducted in a pioneer city implementing the national healthcare reforms and provided references to other areas of China with similar situations.

- The quantitative part of the study was a self-administered questionnaire survey which might introduce recall bias regarding past experiences.

Introduction

China has a three-tier healthcare system in which secondary and tertiary hospitals are supposed to provide specialized care while community health facilities provide primary care and preventive services. However, patients embrace the freedom to choose any level of care facility and direct access to specialist care without referrals by primary care doctors. The country has been engaged in a massive healthcare reform since 2009. Strengthening primary care system and diverting patients with common diseases from hospital-based care to community-based care is one of the top five priorities of the reform. [1] Nevertheless, the reform would not be successful if the voices of the service users are ignored. Previous research focused on patients' satisfaction in health services, including primary care. [2-5] Other studies attempted to explore *patients'* willingness to choose community health services (CHS) for first-contact care, of which percentages ranged between 62% and 70%,[6-8] but our recent study found 70% the respondents sampled from the general *public* preferred hospital-based services for first-contact care.[9] Associated factors included patient's age, sex, education level, insurance status, awareness of CHS, and self-perceived severity of diseases.[7,8,10,11] Better accessibility and affordability were considered as strengths of CHS.[12] A few studies reported patients' concerns about the competence of primary care providers (PCPs) and quality of diagnostic equipment.[9,13-15] The general public's in-depth views towards CHS are lacking.

This study is part of a larger project examining how to better promote primary care in China using a combined qualitative and quantitative approach. The first aim of this article was to examine the general public's views towards the roles of CHS through the qualitative study. In China, PCPs refer to any type of medical practitioners, regardless of educational attainment, providing primary care in the community. They include but not limited to barefoot doctors with

only 3 to 6 months of basic medical training and general practitioners (GPs) with longer, proper

medical education (three-year postsecondary or five-year university education and are

specialized in general practice through general practice training programs). As China is making

great efforts to train 300,000 GPs by 2020 to provide better primary care to its population, [16] the

public's perceptions of GPs was of particular interest of the study. The vast majority of GPs are

practicing in CHS, we therefore targeted GPs in primary care and excluded those based at

university hospitals conducting teaching and research activities. Because the service users are

free to choose between facilities, it is possible that they seek medical help from multiple

resources. The second aim was to investigate through a questionnaire survey their utilization of

community- and hospital-based outpatient services in the year prior to the study, with a focus on

the former. Since China's previous primary care system established between 1960s and 1980s

has been a successful model for lower- and middle-income countries,[17] the Chinese experiences

are relevant to other countries.

Methods

The study method was described elsewhere.[9] Data were collected from the general public living

in the eight districts of central Hangzhou, with a population of 6.95 million, in Zhejiang province.

Qualitative approach

Sampling and data collection

We adopted both individual and focus group interviews to triangulate data. We purposefully

sampled participants with diverse backgrounds for interviews. For individual interviews, we

recruited participants from different age groups, with different education levels, income levels,

and whether diagnosed as having chronic conditions or not. Group interviews were mainly

arranged based on age groups with flexibility allowed. We identified a local researcher who had strong connections with local health authorities. We approached participants with the assistance of community workers.

Topic guides were developed for semi-structured interviews. This article focused on the participants' views of the roles of CHS and GPs. Interviews were conducted from September 2014 to April 2015. Most interviews lasted around 60 minutes and were conducted in a quiet room in the community. Written consent was sought before the interview. Anonymity and confidentiality were stressed.

Data analysis

Interviews were audio-recorded and transcribed verbatim. One of the authors checked the accuracy of the transcripts. Data were analyzed using a thematic approach with the assistance of NVivo 10. Interview transcripts were double coded by two researchers to check for consistency and accuracy. Discrepancies were then discussed until consensus was reached. Afterwards, we organized and categorized codes into different themes/subthemes and further relevant questions were explored in subsequent interviews. We continued data collection until thematic saturation was reached. To ensure data validity, some key findings were triangulated by a follow-up survey. Quotes were translated from Chinese to English for write up.

Quantitative approach

Sampling and data collection

A cross-sectional survey was conducted from July to September 2015. Multi-stage stratified random sampling was adopted. First, we stratified the eight districts to low, middle and high-income regions. One district from each stratum was then randomly selected. Second, two street

districts were randomly selected from each district. Then, 4 communities/villages were randomly selected from each sampled street district, making it a total of 24 survey sites. Lastly, individuals were randomly selected and approached with the assistance of the community workers, and we recruited 45 to 50 respondents from each site. Anonymity was stressed and confidentiality was strictly protected.

Questionnaire

Multiple-choice questions were used for obtaining demographic characteristics. We asked respondents about their utilization of CHS and hospital-based clinics in the year prior to the survey. Experiences and views of community-based services were also asked using four-point Likert scales (1 = completely disagree; 2 = somewhat disagree; 3= somewhat agree; 4 = completely agree). The questionnaire was piloted with 30 respondents to test its face- and content validity. Completing the questionnaire took 10 to 15 minutes. Amendments were made based on feedback.

Statistical analysis

The data were analyzed using IBM SPSS V.23. We had dichotomized the responses by grouping "completely agree and somewhat agree" as positive and "completely disagree and somewhat disagree" as negative response. Number of visits to CHS and hospitals were also categorized as "none" and "at least once" for further analysis. Descriptive analysis was carried out and Pearson Chi-squared test was conducted to examine the differences in the views of community-based services among different age groups. We ran univariate logistic regression and multiple logistic regression analysis to test the effects of personal characteristics (i.e., sex, age, income, health insurance status and chronic conditions) on the use of health services. A p-value < 0.05 is considered statistically significant.

Results

Qualitative results

Six focus group interviews were held. Each group comprised of 6 to 8 participants. Meanwhile, 13 semi-structured individual interviews were conducted. Among the participants, 44.4% were males. The mean age of all participants was 52.6 (SD=17.0), with the age ranged from 24 to 87. Views towards the roles of CHS and perceptions of GPs were revealed.

Roles of community health services

Many participants perceived that CHS were like drug dispensers rather than a medical care provider (Table 1, quotes 1 and 2). CHS were regarded as a source for dealing with minor illnesses, such as common colds and skin abrasions (Table 1, quote 3). Nevertheless, the public's perception of minor and urgent/serious conditions might be largely different from the professionals' views and varied across different participants (Table 1, quotes 4 and 5). For example, fevers and abdominal discomfort were considered by some as conditions that need hospital specialist consultations to confirm the causes (Table 1, quotes 4 and 5). When the interviewer asked "_what proportion of your health problems can be dealt with by primary care providers_", the responses widely range from 20% to 90%.

Elderly patients with chronic diseases can be well managed in CHS (Table 1, quote 6). Some participants described it as a source for follow-up care for chronic diseases but not for confirming the initial diagnosis and management plan even for diabetes and hypertension (Table 1, quotes 7 and 8). A key role played by CHS was to provide general and public health education to the general public, as explained by a participant (Table 1, quote 9). The function of triaging or making referrals by CHS was also discussed by some participants. CHS could inform patients to

make better decisions about which specialty to see or where to see a specialist (Table 1, quotes

10 and 11). Such a status quo was deemed by them as a step forward compared to the past (Table

1, quote 11). However, the lack of trust in PCPs' integrity might pose a challenge for this

function. For the question "*what would you think about a PCP making an appointment with

hospital specialists for you, as a coordinator?*", an interviewee responded that he would doubt if

the PCP was a "tuo er"[a] (Table 1, quote 12).

Table 1 The public views towards the roles of community health services

Theme	Sub-themes	Quotes
Perceived roles of CHS	Drug dispensers	1. It feels just like a drug store. It is exactly the same nature. Drug stores are similar [to community health facilities] and they are licensed too. (Group3, P4) 2. I would request the drugs I want and he [the primary care provider] then prescribes it. If I need to see a doctor for illness, I would go to a hospital. (Individual, P4)
	Minor illness management	3. When I feel that I have a cough and running nose, I don't think that I have to go to a big hospital. Then [I could go to] a community facility and the doctor can prescribe me some medications to treat my sore throat or my symptoms. If you are talking about severe conditions, they indeed cannot deal with them. (Group3, P5) 4. If you have fevers, you definitely need to go to a big hospital. (Group3, P3) 5. [I] usually come here [the community facility] for common colds or fevers. For major illnesses, I go to hospitals, such as hepatitis, cancer, or something in the abdomen. (Individual, P6)
	Elderly care and chronic disease management	6. Community [health facilities] cannot deal with urgent cases after all. I think they can provide daily care to elderly patients and manage chronic diseases. (Individual, P11) 7. Community [health facilities] can refill my medications as I have needed taking medications for diabetes and hypertension for a long time and it is too troublesome to go to a hospital for refilling medications. (Group3, P5) 8. Even if we go [to the community facility], they cannot

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[a] "Tuo er" is a Beijing dialect which means a cunning agent who pretends to be a client and tries to deceive the real customers and lead them to buy their products. It exists in many industries. In health industry, it means an agent who tries to lead patients to some notorious hospitals to make money.

		identify the diagnosis. If they were able to diagnose my diabetes, of course I would go. They can identify hypertension but they don't know what medications to use. It's like the [primary care] doctor is not able to prescribe [the right drug] and he could only prescribe according to what a hospital specialist has prescribed to me. He would say that "the hospital hasn't prescribed [the drug before], so I dare not prescribe this." (Individual, P1)
	Patient education	9. Nowadays, people pay more attention to their health. They [community health facilities], I think, should do a lot of health education and improve the public's lifestyle, such as forming healthy living habits. Lifestyle like how much salt and oil one should consume. Some of these are very minor issues, but if you repeat more often, they can become people's common sense, such as low-salt, low-fat diet, and exercise every day. The community facilities' role of health education is irreplaceable. (Individual, P11)
	Referral services	10. Maybe average people would consult [doctors] in the community to figure out which specialty they need to see first. (Individual, P11)
		11. [Community health facilities] can sometimes make an initial assessment for you, like what problem you might have and where you need to take a test. Then you know where to target and you don't have to look around when you go to [a hospital in] the city. It is more convenient and you know which specialty to see, internal medicine, surgery, neurology or whatever. It is much more convenient than before. (Group6, P1)
		12. If he helps me make an appointment, I would be suspicious. I cannot help thinking if he is a "tuo er". There is a possibility that they may take kickbacks. The other doctor liaised by him may be his relative. I heard this from others because there are too many such reports. (Individual, P10)

Perceptions towards general practitioners

Many participants frankly expressed that GPs, a subgroup of PCPs who were relatively better educated and trained, were like barefoot doctors with minimal formal medical education (Table 2, quote 1). The local dialects used were "san jiao mao" (a cat with three legs[a]) and "wan jin you" (Tiger Balm[b]), meaning that GPs saw any diseases yet were not good at any kind of them (Table 2, quotes 2 and 3). In the doctor-patient relationship, patients sometimes appeared to play a dominant role and requested treatments (Table 2, quotes 4 and 5). Using "san jiao mao" or "wan jin you" as a metaphor to describe GPs demonstrated a strong public distrust in the level of competence of GPs (Table 2, quotes 6 and 7). One major cause was the participants' belief that GPs were inadequately educated and trained (Table 2, quote 7).

Table 2 The public's perceptions of general practitioners

Theme	Sub-themes	Quotes
Perceptions of general practitioners (GPs)	Barefoot doctors	1. I think GPs should know a wide range of diseases, including internal medicine, surgery or dermatology. This is how I understand it—knowing a bit about every specialty. GPs are like barefoot doctors. They cannot deal with many problems and he will suggest you go to a hospital. (Group3, P2)
	San jiao mao	2. Using our dialect, he [a GP] is like "san jiao mao", i.e., a barefoot doctor. It means that he knows a little bit about everything. But, offensively, when you ask further medical questions, he doesn't know [about the illness] or about the medications. (Group3, P5)
	Wan jin you	3. GPs are "wan jin you". They are just like "jack of all trades and master of none". We locals think this way. (Individual, P11)
	Patient-dominance in	4. Speaking of general practitioners, when I go to see a GP, it's up to me to decide what medications I need. (Group1, P1)

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[a] A popular idiom in Yangtze River Delta. It means jack of all trades and master of none
[b] A Chinese relieving ointment which can be applied for many conditions such as skin itchiness, headache, rheumatic pains, and diarrhea etc., leading to mild relief but not curing the diseases.

| the GP-patient relationship | 5. For example, if I have a common cold then I would say [to the doctor], "Tylenol" (a domestic type of paracetamol). That's it. He is not the doctor. I am the doctor. (Gp3, P3) |
| Causes | 6. Honestly, if you really ask a GP to explain the details about certain drugs or what side effects the drugs would have, in most cases, he cannot tell. If you ask him why he prescribe this medication to me, he would say "everyone prescribes this then I also prescribe this" or "our facility has this medicine only". He just gives such an explanation. (Group5, P1)
 7. I had a surgery on my leg this year and I had my dressing changed [at the GP's clinic]. Honestly, the GP was like that he cannot even target my wound. I can even do it better than he does. These are called GPs. I would put a question mark. These people may not be well trained and educated. (Group4, P3) |

Survey results

A total of 1248 respondents completed the questionnaire. The overall response rate was 83%.

Nearly half (49.4%) of the respondents were female. There were 132 (10.6%) aged 60 or above.

Five hundred and four (40.4%) obtained post-secondary or higher education and 393 (31.5%)

reported a monthly household income of 10,000 Yuan or above. The vast majority (1037, 83.1%)

were insured. Over one-fifth reported a chronic condition. Details of their demographic

characteristics have been reported elsewhere.[9] The majority (800, 64.1%, 95%CI 61.4%-66.7%)

visited hospital-based clinics and less (688, 55.1%, 95%CI 52.4%-57.9%) visited community-

based clinics at least once in the past year. Detailed visits to the two types of clinic are shown in

Table 3.

Table 3 Visits to community- and hospital-based services in the year prior to the survey

Number of visits	0		1-3 times		4-6 times		7-10 times		>10 times		Missing	
Community health facilities	485	(38.9)	455	(36.5)	125	(10.0)	42	(3.4)	66	(5.3)	75	(6.0)
Hospital outpatient clinics	376	(30.1)	557	(44.6)	154	(12.3)	41	(3.3)	48	(3.8)	72	(5.8)

Table 4 shows the associations between individual characteristics and the outpatient services

utilization. Compared to the uninsured group, those who had some medical insurance were more

likely to use hospital-based services (adjusted odds ratio or AOR=1.58, , 95%CI 1.06-2.37).

Those who reported the highest household income (AOR=1.80, 95%CI 1.25-2.58) and a

diagnosis of chronic illnesses (AOR=1.76, 95%CI 1.22-2.54) were more likely to use hospital-

based services. In relation to community-based services, reporting a diagnosis of chronic

illnesses was significantly associated with the utilization (AOR=1.68, 95%CI 1.20-2.34) whereas

the likelihood significantly decreased with income levels (AOR=0.67, 95%CI 0.48-0.95).

Table 4 Correlates of use of hospital- and community-based outpatient services

	Odds Ratio and Adjusted Odds Ratio of visiting a hospital specialist last year		Odds Ratio and Adjusted Odds Ratio of visiting a community-based clinic last year	
	OR(95% CI)	AOR(95% CI)	OR(95% CI)	AOR(95% CI)
Sex				
Male	1	1	1	1
Female	1.19(0.93,1.53)	1.22(0.93,1.59)	1.29(1.02,1.63) *	1.28(1.00,1.64)
Age				
18-39	1	1	1	1
40-59	1.20(0.89,1.62)	1.12(0.80,1.56)	1.09(0.82,1.44)	0.94(0.69,1.28)
60 or above	1.16(0.77,1.74)	0.86(0.54,1.38)	1.48(0.99,2.20)	1.17(0.74,1.84)
Insurance status				
Uninsured	1	1	1	1
Insured	1.59(1.10,2.31)*	1.58(1.06,2.37) *	1.18(0.82,1.71)	1.24(0.83,1.85)
Income				
< 4000	1	1	1	1
4000-9999	1.19(0.88,1.62)	1.15(0.83,1.61)	0.78(0.58,1.06)	0.76(0.55,1.05)
>10000	1.85(1.33,2.58)***	1.80(1.25,2.58) **	0.63(0.46,0.86)**	0.67(0.48,0.95) *
Chronic illness diagnosis				
No	1	1	1	1
Yes	1.70(1.23,2.34)**	1.76(1.22,2.54) **	1.68(1.25,2.25)**	1.68(1.20,2.34) **

Model fit descriptions for multiple logistic regression analysis: p values of Hosmer and Lemeshow test respectively for the two

dependent variables are 0.456 and 0.454, indicating that the models fit the data well.

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

Among the 688 CHS users, 464 (67.4%) offered comments about their experiences of using CHS (Table 5). Over half of them (53.4%) reported that they had a regular PCP, with significantly more respondents aged 60 or above reporting this than the other two age groups (p=0.020). Main reasons for visiting a community-based practitioner were refilling medications (54.7%) and seeking professional advice (64.0%). More from the elderly (84.7%) and middle aged (64.2%) groups than the youngest group (45.0%) went to CHS to buy or refill medications (p<0.001).

Almost 84% said that PCPs were polite to them. Up to 86.2% reported that PCPs listened to patients carefully. Nearly 80% reported that PCPs explained the disease, management plan and drug adverse effects patiently. Around two thirds said that PCPs cared about their mental health (65.3%), were empathetic (69.2%), tried to keep a good relationship with the patient (68.1%) and put patients' interests at the first place (67.9%). However, only 43 (9.3%, 95%CI 7.0%-12.3%) reported that over 75% of their medical problems were managed by PCPs and 60.2% reported that 50% or less of their medical problems were managed by PCPs when they felt ill and sought help from a doctor.

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Table 5 Community health service users' experiences and their views of primary care providers by age n(%)

	% of "Agree" N=464		Age 18-39		40-59		60 or above		P value χ2 test
I have a regular doctor.	248[b]	(53.4)	135	(50.2)	61	(55.0)	50	(68.5)	0.020
One main reason I go to a PCP[a] is to seek their professional advice.	297	(64.0)	187	(69.0)	66	(60.0)	41	(57.7)	0.092
One main reason I go to a PCP is to buy or refill some medications.	254	(54.7)	122	(45.0)	70	(64.2)	61	(84.7)	0.000
PCPs are polite to me	388	(83.6)	218	(80.7)	100	(89.3)	67	(91.8)	0.020
PCPs listen to me carefully when I talk about my illness	400	(86.2)	233	(86.3)	101	(90.2)	63	(86.3)	0.565
PCPs explain to me patiently (e.g. my disease, management plan, drug adverse effects etc.)	370	(79.7)	211	(78.4)	94	(83.9)	62	(84.9)	0.289
PCPs care about my mental health (e.g. my worries and mood etc.)	303	(65.3)	168	(62.0)	75	(67.0)	58	(79.5)	0.020
PCPs are empathetic.	321	(69.2)	183	(67.5)	79	(70.5)	57	(80.3)	0.112
PCPs keep a good relationship with me.	316	(68.1)	181	(66.8)	77	(70.0)	56	(77.8)	0.196
PCPs put patients' interests at first place.	315	(67.9)	178	(65.7)	79	(71.2)	55	(77.5)	0.135

[a] PCP: primary care provider

[b] The numbers do not add up because of missing ages in some of the responses

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Discussion

Both community- and hospital-based outpatient services were heavily consumed, with the latter being used by more respondents. In a health system which allows a large degree of freedom to choose any health institution for healthcare, patients choose hospitals which they think can provide better care. Lack of confidence in PCPs' competence is widespread. Many participants did not view GPs as expert generalists in managing common diseases but perceived GPs as inferior in managing diseases of specific organ systems than specialists. Their perceptions might also be affected by historical factors. GPs were deemed not different from barefoot doctors who, although with inadequate training, met basic healthcare needs of the rural population from 1960s to 1980s but less so at the present time. The bad experiences, such as not getting satisfactory explanations from a GP, reinforced such perceptions.

Inadequate formal medical education and training for PCPs is an underlying problem. In 2013, around 76% of PCPs in urban community health facilities obtained 3 or more years of formal medical education and this compared to 90% of hospital specialists.[16] Doctors' showing clinical competence is critical to gaining patients' trust which lays a foundation for a healthy doctor-patient relationship.[18] Improving PCPs' competence through bettering the primary care education system is a top priority for building a strong primary care system and the subsequent success of health reforms in China. Besides, higher household income and insured respondents were more likely to use hospital-based services. People may be inclined to put their preference into practice when the financial constraints are reduced or removed. Patients with chronic diseases need long-term care which generally increases the chances for visiting doctors in both hospitals and CHS.

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One perceived functions of CHS in the public's eyes is minor illness management. However, the public's understanding may be greatly different from the professionals' views. Common conditions, such as fevers and abdominal discomfort, most of which are minor, are considered by some patients as conditions that need hospital specialists' consultations or diagnostic tests to confirm the causes and management plans. CHS is also considered a referral agency which could advise patients of a preferred hospital specialist. This is a positive trend because, if the public are willing to accept CHS as a referral body, to some extent, CHS can function as a gatekeeper and coordinator. Helping patients make better informed decisions of seeing appropriate specialists has the potential to reduce unnecessary care considerably.

Other roles of CHS, which are well accepted by the public, include drug dispensing, managing patients with chronic diseases and patient education. Although the service users lack confidence in CHS as a provider of first-contact care,[9] providing aforementioned quality services to patients in need can gradually build up a rapport with the patients, and regain trust. Strengthening these functions are likely to be a good starting point for CHS to attract and keep patients in primary care. However, "Tuo er" mentioned by one participant indicates that a deep distrust in PCPs' integrity in acting as a coordinator may exist, which may worth further research and actions.

This study has some strengths and limitations. The data were collected in a developed urban city where hospitals are easily accessible to the general public. The study findings may not be generalizable to less developed, rural areas. However, as one of the earliest health reform pilot cities, Hangzhou has developed a highly accessible and affordable primary care system. The findings provide a snapshot of the public's healthcare utilization patterns in the context of an intensive healthcare reform. Then a self-administered questionnaire might introduce recall bias regarding past experiences. We designed the experience questions using ranges to make it easier

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to respond. The items on their views and attitudes are subjective in nature and concerns about recall bias are inconsequential. Further, our qualitative study enables us to acquire an in-depth understanding of their thoughts.

Conclusion

The study aimed to investigate the public's views towards CHS and their healthcare utilization experiences. Both community- and hospital-based outpatient services are heavily consumed with the latter being used by more respondents. The public's perceptions of GPs reflect a deep distrust in their competence. The distrust places a huge obstacle to CHS assuming the role of first-contact care provider. Nevertheless, other functions like making referrals, providing follow-up care and health education are well accepted and can be a good starting point for CHS to earn public trust. The gatekeeping role shall be gradually adopted by CHS after a strong primary care workforce is established by a primary care oriented education system.

Conflict of interests

The authors declared no conflict of interests.

Ethics approval

Ethical approvals were obtained from the Review Boards of The University of Hong Kong/Hospital Authority Hong Kong West Cluster (UW14-567) and Zhejiang University (ZGL201410H) respectively.

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Contributors

DW, TPL, and XDZ designed the study and the questionnaire. DW and XDZ coordinated fieldwork and collected data. DW, SKS and KFL performed the data analysis. DW, SKS and TPL interpreted the analysis. DW, SKS and TPL drafted the manuscript. All authors reviewed, revised, and approved the final manuscript.

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Public views towards community health and hospital-based outpatient services and their utilization in Zhejiang, China – A mixed methods study

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Title: Public views towards community health and hospital-based outpatient services and their utilization in Zhejiang, China – A mixed methods study

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Abstract

Objective: China is engaged in promoting community health services (CHS) nationwide. This study examines the public's views towards CHS and their utilization of community- and hospital-based outpatient services.

Design: A mixed-methods study using qualitative interviews and a cross-sectional survey.

Study setting and participants: The study was conducted among the public between September 2014 and September 2015 in Zhejiang province, China. Six focus groups and thirteen individuals were interviewed. The questionnaire was completed by 1248 respondents (response rate: 83%).

Primary outcome measures: Utilization of community- and hospital-based outpatient services.

Results: Functions of CHS perceived by the public included provision of minor illness management, coordination, drug dispensing, follow-up care, and patient education. However, many also showed a distrust in primary care providers' (PCPs) competence for confirming the initial diagnosis and management plan. As coordinators, PCPs' integrity was challenged and PCPs were thought to be potential "tuo er" (cunning agents who tried to lead patients to some notorious hospitals to make money).

Survey results showed that 800 (64.1%) respondents visited hospital-based clinics and 688 (55.1%) visited CHS at least once in the past year. Compared to the uninsured group, those covered by Urban Resident Medical Insurance (adjusted odds ratio or AOR=1.95, 95%CI 1.24-3.07) and Urban Employee Medical Insurance (AOR=2.59, 95%CI 1.59-4.24) were more likely to use hospital-based services. Respondents who had a chronic condition were more likely than their counterparts to use both hospital-based services (AOR=1.72, 95%CI 1.18-2.49) and CHS (AOR=1.66, 95%CI 1.19-2.32). Income levels were positively associated with the likelihood of

visiting hospital-based clinics (AOR=1.67, 95%CI 1.15-2.42) but negatively associated with the likelihood of using CHS (AOR=0.68, 95%CI 0.48-0.96).

Conclusions: Demand of hospital-based outpatient services is much higher than the community-based outpatient services. Policy reformers need to take further actions to address the public distrust in PCPs to facilitate their gatekeeping role.

Strengths and limitations of this study

- Our qualitative part provided the in-depth views of service users towards the community health services.

- The quantitative data triangulated the qualitative findings using a follow up cross-sectional survey approach.

- The study mapped out the public's utilization of both community- and hospital-based outpatient services in a free market style healthcare system in the urban setting.

- The study was conducted in a pioneer city implementing the national healthcare reforms and provided references to other areas of China with similar situations.

- The quantitative part of the study was a self-administered questionnaire survey which might introduce recall bias regarding past experiences.

Introduction

China has a three-tier healthcare system in which secondary and tertiary hospitals are supposed to provide specialized care while community health facilities provide primary care and preventive services. However, patients embrace the freedom to choose any level of care facility and direct access to specialist care without referrals by primary care doctors. The country has been engaged in a massive healthcare reform since 2009. Strengthening primary care system and diverting patients with common diseases from hospital-based care to community-based care is one of the top five priorities of the reform. [1] Nevertheless, the reform would not be successful if the voices of the service users are ignored. Previous research focused on patients' satisfaction in health services, including primary care. [2-5] Other studies attempted to explore *patients'* willingness to choose community health services (CHS) for first-contact care, of which percentages ranged between 62% and 70%, [6-8] but our recent study found 70% of the respondents sampled from the general *public* preferred hospital-based services for first-contact care. [9] Associated factors included patient's age, sex, education level, insurance status, awareness of CHS, and self-perceived severity of diseases. [7,8,10,11] Better accessibility and affordability were considered as strengths of CHS. [12] A few studies reported patients' concerns about the competence of primary care providers (PCPs) and quality of diagnostic equipment. [9,13-15] The general public's in-depth views towards CHS are lacking.

This study is part of a larger project examining how to better promote primary care in China using a combined qualitative and quantitative approach. The first aim of this article was to examine the general public's views towards the roles of CHS through the qualitative study. In China, PCPs refer to any type of medical practitioners, regardless of educational attainment, providing primary care in the community. PCPs include general practitioners (GPs who have

three-year or five-year medical education and are specialized in general practice through general practice training programs), barefoot doctors (3 to 6 months of basic medical training), and other medical practitioners providing primary care in the community setting. Because the service users are free to choose between facilities, it is possible that they seek medical help from multiple resources. The second aim was to investigate through a questionnaire survey their utilization of community- and hospital-based outpatient services in the year prior to the study, with a focus on the former. Since China's previous primary care system established between 1960s and 1980s has been a successful model for lower- and middle-income countries,[16] the Chinese experiences are relevant to other countries.

Methods

The study method was described elsewhere.[9] Data were collected from the general public living in the eight districts of central Hangzhou, with a population of 6.95 million, in Zhejiang province.

Qualitative approach

Sampling and data collection

We adopted both individual and focus group interviews to triangulate data. We purposefully sampled participants with diverse backgrounds for interviews. For individual interviews, we recruited participants from different age groups, with different education levels, income levels, and whether diagnosed as having chronic conditions or not. Group interviews were mainly arranged based on age groups with flexibility allowed. We identified a local researcher who had strong connections with local health authorities. We approached participants with the assistance of community workers.

Topic guides were developed for semi-structured interviews. This article focused on the participants' views of the roles of CHS and PCPs. Interviews were conducted between September 2014 and April 2015. Most interviews lasted around 60 minutes and were conducted in a quiet room in the community. Written consent was sought before the interview. Anonymity and confidentiality were stressed.

Data analysis

Interviews were audio-recorded and transcribed verbatim. One of the authors checked the accuracy of the transcripts. Data were analyzed using a thematic approach with the assistance of NVivo 10. Interview transcripts were double coded by two researchers to check for consistency and accuracy. Discrepancies were then discussed until consensus was reached. Afterwards, we organized and categorized codes into different themes/subthemes and further relevant questions were explored in subsequent interviews. We continued data collection until thematic saturation was reached. To ensure data validity, some key findings were triangulated by a follow-up survey. Quotes were translated from Chinese to English for write up.

Quantitative approach

Sampling and data collection

A cross-sectional survey was conducted from July to September 2015. Multi-stage stratified random sampling was adopted. First, we stratified the eight districts to low, middle and high-income regions. One district from each stratum was then randomly selected. Second, two street districts were randomly selected from each district. Then, 4 communities/villages were randomly selected from each sampled street district, making it a total of 24 survey sites. Lastly, individuals were randomly selected and approached with the assistance of the community workers, and we

recruited 45 to 50 respondents from each site. Anonymity was stressed and confidentiality was

strictly protected.

Questionnaire

The complete questionnaire has 64 items. We asked the participants about their social

demographic characteristics, insurance scheme (New Cooperative Medical Insurance or NCMI,

Urban Resident Medical Insurance or URMI, Urban Employee Medical Insurance or UEMI, and

commercial insurance), factors they consider for finding sources of care, preferred source of care,

use of outpatient services in the last year, expectations on medical professionals in the clinical

setting, and views of CHS and PCPs. . NCMI covered rural population, URMI covered people

who were under 18 years old, the unemployed or poor, the disabled, and the elderly population,

while UEMI covered employees. In this article, we reported the public's utilization of CHS and

hospital-based clinics in the last year and the correlates. Experiences and views of community-

based services were asked using four-point Likert scales (1 = completely disagree; 2 = somewhat

disagree; 3= somewhat agree; 4 = completely agree). The questionnaire was piloted with 30

respondents to test its face- and content validity. The questionnaire aimed at investigating the

attitudes and behaviors of the respondents, but did not serve as a composite measure of a certain

domain. Hence it has not been validated against outcomes formally other than the face and

content validity. Completing the questionnaire took 10 to 15 minutes. Amendments were made

based on feedback.

Statistical analysis

The data were analyzed using IBM SPSS V.23. We had dichotomized the responses by grouping

"completely agree and somewhat agree" as positive and "completely disagree and somewhat

disagree" as negative response. Number of visits to CHS and hospitals were also categorized as

"none" and "at least once" for further multiple logistic regression analysis. Descriptive analysis was carried out and Pearson Chi-squared test was conducted to examine the differences in the views of community-based services among different age groups. We ran simple logistic regression and multiple logistic regression analyses to test the effects of personal characteristics (i.e., sex, age, income, health insurance status and chronic conditions) on the use of health services and public opinions of PCPs. A p-value < 0.05 is considered statistically significant.

Results

Qualitative results

Six focus group interviews were held. Each group comprised of 6 to 8 participants. Meanwhile, 13 semi-structured individual interviews were conducted. Among the participants, 44.4% were males. The mean age of all participants was 52.6 (SD=17.0), with the age ranged from 24 to 87. Views towards the roles of CHS and perceptions of PCPs were revealed.

Roles of community health services

Many participants perceived that CHS were like drug dispensers rather than a medical care provider (Appendix 1, quotes 1 and 2). CHS were regarded as a source for dealing with minor illnesses, such as common colds and skin abrasions (Appendix 1, quote 3). Nevertheless, the public's perception of minor and urgent/serious conditions might be largely different from the professionals' views and varied across different participants. For example, fevers and abdominal discomfort were considered by some as conditions that need hospital specialist consultations to confirm the causes (Appendix 1, quotes 4 and 5). When the interviewer asked "*what proportion of your health problems can be dealt with by primary care providers*", the responses widely range from 20% to 90%.

Elderly patients with chronic diseases can be well managed in CHS (Appendix 1, quote 6). Some participants described it as a source for follow-up care for chronic diseases but not for confirming the initial diagnosis and management plan even for diabetes and hypertension (Appendix 1, quotes 7 and 8). A key role played by CHS was to provide general and public health education to the general public, as explained by a participant (Appendix 1, quote 9). The function of triaging or making referrals by CHS was also discussed by some participants. CHS could inform patients to make better decisions about which specialty to see or where to see a specialist (Appendix 1, quotes 10 and 11). Such a status quo was deemed by them as a step forward compared to the past (Appendix 1, quote 11). However, the lack of trust in PCPs' integrity might pose a challenge for this function. For the question "*what would you think about a PCP making an appointment with hospital specialists for you, as a coordinator?*", an interviewee responded that he would doubt if the PCP was a "tuo er"[a] (Appendix 1, quote 12).

Perceptions towards primary care providers

Many participants frankly expressed PCPs were like barefoot doctors with minimal formal medical education (Appendix 2, quote 1). The local dialects used were "san jiao mao" (a cat with three legs[b]) and "wan jin you" (Tiger Balm[c]), meaning that PCPs saw any diseases yet were not good at any kind of them (Appendix 2, quotes 2 and 3). In the doctor-patient relationship, patients sometimes appeared to play a dominant role and requested treatments (Appendix 2, quotes 4 and 5). Using "san jiao mao" or "wan jin you" as a metaphor to describe PCPs demonstrated a strong public distrust in the level of competence of PCPs (Appendix 2, quotes 6

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[a] "Tuo er" is a Beijing dialect which means a cunning agent who pretends to be a client and tries to deceive the real customers and lead them to buy their products. It exists in many industries. In health industry, it means an agent who tries to lead patients to some notorious hospitals to make money.

[b] A popular idiom in Yangtze River Delta. It means jack of all trades and master of none

[c] A Chinese relieving ointment which can be applied for many conditions such as skin itchiness, headache, rheumatic pains, and diarrhea etc., leading to mild relief but not curing the diseases.

and 7). One major cause was the participants' belief that PCPs were inadequately educated and

trained (Appendix 2, quote 7).

Survey results

A total of 1248 respondents completed the questionnaire. The overall response rate was 83%.

Nearly half (49.4%) of the respondents were female. There were 132 (10.6%) aged 60 or above.

Five hundred and four (40.4%) obtained post-secondary or higher education and 393 (31.5%)

reported a monthly household income of 10,000 Yuan or above. Nearly one-fourth (325, 26.0%)

were covered by NCMI, 388 (31.1%) were covered by URMI, and 272 (21.8%) were covered by

UEMI. Over one-fifth (265, 21.2%) had a chronic condition. Details of their demographic

characteristics have been reported elsewhere.[9] The majority (800, 64.1%, 95%CI 61.4%-66.7%)

visited hospital-based clinics in the past year. Less (688, 55.1%, 95%CI 52.4%-57.9%) visited

community-based clinics, 507 (74.2%) of whom also visited hospital clinics in the past year.

Detailed distribution of the number of visits to the two types of clinic are shown in Table 1.

Table 1 Visits to community- and hospital-based services in the year prior to the survey. N=1248

Number of visits (times)	0(%)		1-3(%)		4-6(%)		7-10(%)		>10(%)		Missing	
Community health facilities	485	(38.9)	455	(36.5)	125	(10.0)	42	(3.4)	66	(5.3)	75	(6.0)
Hospital outpatient clinics	376	(30.1)	557	(44.6)	154	(12.3)	41	(3.3)	48	(3.8)	72	(5.8)

Table 2 shows the associations between individual characteristics and the outpatient services

utilization based on the simple and multiple logistic regression analyses. Compared to the

uninsured group, those covered by URMI (adjusted odds ratio or AOR=1.95, 95%CI: 1.24-3.07)

and UEMI (AOR=2.59, 95%CI: 1.59-4.24) were significantly more likely to use hospital-based

services. Those who reported the highest household income (AOR=1.67, 95%CI: 1.15-2.42) and

a diagnosis of chronic illnesses (AOR=1.72, 95%CI: 1.18-2.49) were more likely to use hospital-

based services. In relation to community-based services, reporting a diagnosis of chronic

illnesses was significantly associated with the utilization (AOR=1.66, 95%CI: 1.19-2.32)

whereas the likelihood significantly decreased with income levels (AOR=0.68, 95%CI: 0.48-

0.96).

Table 2 Correlates of use of hospital- and community-based outpatient services

	Odds Ratio and Adjusted Odds Ratio of visiting a hospital specialist last year at least once		Odds Ratio and Adjusted Odds Ratio of visiting a community-based clinic last year at least once	
	OR(95% CI)	AOR(95% CI)	OR(95% CI)	AOR(95% CI)
Sex				
Male	1	1	1	1
Female	1.19(0.93,1.53)	1.16(0.88,1.52)	1.29(1.02,1.63) *	1.26(0.98,1.62)
Age				
18-39	1	1	1	1
40-59	1.20(0.89,1.62)	1.11(0.79,1.55)	1.09(0.82,1.44)	0.94(0.69,1.28)
60 or above	1.16(0.77,1.74)	0.70(0.43,1.14)	1.48(0.99,2.20)	1.16(0.73,1.84)
Insurance status				
Uninsured	1	1	1	1
NCMI[a]	0.99(0.65,1.49)	1.08(0.69,1.68)	1.19(0.79,1.80)	1.27(0.81,1.97)
URMI[b]	1.99(1.31,3.01)**	1.95(1.24,3.07)**	1.26(0.84,1.88)	1.30(0.84,2.02)
UEMI[c]	2.45(1.56,3.85)***	2.59(1.59,4.24) ***	1.14(0.75,1.74)	1.22(0.77,1.92)
Commercial insurance	1.07(0.55,2.08)	1.03(0.51,2.08)	0.89(0.46,1.71)	0.97(0.49,1.94)
Income				
< 4000	1	1	1	1
4000-9999	1.19(0.88,1.62)	1.09(0.78,1.52)	0.78(0.58,1.06)	0.76(0.55,1.05)
>10000	1.85(1.33,2.58)***	1.67(1.15,2.42) **	0.63(0.46,0.86)**	0.68(0.48,0.96) *
Chronic illness diagnosis				
No	1	1	1	1
Yes	1.70(1.23,2.34)**	1.72(1.18,2.49) **	1.68(1.25,2.25)**	1.66(1.19,2.32) **

[a]NCMI: new cooperative medical insurance; [b]URMI: urban resident medical insurance; [c]UEMI: urban employee medical insurance

Model fit descriptions for multiple logistic regression analysis: p values of Hosmer and Lemeshow test respectively for the two dependent variables are 0.456 and 0.454, indicating that the models fit the data well.

* p<0.05, ** p<0.01, *** p<0.001

Among the 688 CHS users, 464 (67.4%) offered comments about their experiences of using CHS (Table 3). Over half of them (53.4%) reported that they had a regular PCP, with significantly more respondents aged 60 or above reporting this than the other two age groups (p=0.020). Main reasons for visiting a community-based practitioner were refilling medications (54.7%) and seeking professional advice (64.0%). More from the elderly (84.7%) and middle aged (64.2%) groups than the youngest group (45.0%) went to CHS to buy or refill medications (p<0.001).

Almost 84% said that PCPs were polite to them. Up to 86.2% reported that PCPs listened to patients carefully. Nearly 80% reported that PCPs explained the disease, management plan and drug adverse effects patiently. Two thirds said that PCPs cared about their mental health (66%), were empathetic (69.2%), tried to keep a good relationship with the patient (68.1%) and put patients' interests at the first place (67.9%).

There were differences in their views by number of visits to CHS (Table 4). The percentages of reporting seeing a regular PCP (p=0.037), PCPs caring about their mental health status (p=0.004), keeping a good relationship (p=0.015), and putting patients' interests at first place (p=0.006) increased with the number of visits to CHS. Further, the percentage of reporting a purpose for refilling medications at CHS is higher among the frequent visitors of CHS, compared to those who visited less frequently (p=0.002). After controlling for sex, insurance status and income, multiple logistic regression analysis revealed that, compared to the age group 18-39, those aged over 60 were significantly more likely to have reported the purpose of refilling medication at CHS (AOR=5.59, 95%CI 2.62-11.92), and that PCPs cared about their mental health (AOR=2.04, 95%CI 1.00-4.13). Visiting over 10 times in the last year had a significant positive correlation with reporting PCPs caring about their mental health (AOR=3.42, 95%CI 1.33-8.81), keeping a

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good relationship (AOR=3.08, 95%CI 1.23-7.69) and putting patients' interests as the priority

(AOR=2.97, 95%CI 1.19-7.39), compared to those who paid 1-3 visits. However, only 43 (9.3%,

95%CI 7.0%-12.3%) reported that over 75% of their medical problems were managed by PCPs

and 60.2% reported that 50% or less of their medical problems were managed by PCPs when

they felt ill and sought help from a doctor.

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Table 3 Community health service users' experiences and their views of primary care providers by age. N=464

		Total(%)		Age						p-value χ2 test
				18-39(%)		40-59(%)		60 or above(%)		
I have a regular doctor.	Agree	246[b]	(54.3)	135	(50.2)	61	(55.0)	50	(68.5)	0.020
	Disagree	207	(45.7)	134	(49.8)	50	(45.0)	23	(31.5)	
One main reason I go to a PCP[a] is to seek their professional advice.	Agree	294	(65.0)	187	(69.0)	66	(60.0)	41	(57.7)	0.092
	Disagree	158	(35.0)	84	(31.0)	44	(40.0)	30	(42.3)	
One main reason I go to a PCP is to buy or refill some medications.	Agree	253	(56.0)	122	(45.0)	70	(64.2)	61	(84.7)	0.000
	Disagree	199	(44.0)	149	(55.0)	39	(35.8)	11	(15.3)	
PCPs are polite to me	Agree	385	(84.6)	218	(80.7)	100	(89.3)	67	(91.8)	0.020
	Disagree	70	(15.4)	52	(19.3)	12	(10.7)	6	(8.2)	
PCPs listen to me carefully when I talk about my Illness	Agree	397	(87.3)	233	(86.3)	101	(90.2)	63	(86.3)	0.565
	Disagree	58	(12.7)	37	(13.7)	11	(9.8)	10	(13.7)	
PCPs explain to me patiently (e.g. my disease, management plan, drug adverse effects etc.)	Agree	367	(80.8)	211	(78.4)	94	(83.9)	62	(84.9)	0.289
	Disagree	87	(19.2)	58	(21.6)	18	(16.1)	11	(15.1)	
PCPs care about my mental health (e.g. my worries and mood etc.)	Agree	301	(66)	168	(62.0)	75	(67.0)	58	(79.5)	0.020
	Disagree	155	(34.0)	103	(38.0)	37	(33.0)	15	(20.5)	
PCPs are empathetic.	Agree	319	(70.3)	183	(67.5)	79	(70.5)	57	(80.3)	0.112
	Disagree	135	(29.7)	88	(32.5)	33	(29.5)	14	(19.7)	
PCPs keep a good relationship with me.	Agree	314	(69.3)	181	(66.8)	77	(70.0)	56	(77.8)	0.196
	Disagree	139	(30.7)	90	(33.2)	33	(30.0)	16	(22.2)	
PCPs put patients' interests at first place.	Agree	312	(68.9)	178	(65.7)	79	(71.2)	55	(77.5)	0.135
	Disagree	141	(31.1)	93	(34.3)	32	(28.8)	16	(22.5)	

[a] PCP: primary care provider; [b] The numbers do not add up because of missing ages in some of the responses

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There were differences in their views by number of visits to CHS (Table 4). The percentages of reporting PCPs caring about their mental health status (p=0.008), and putting patients' interests at first place (p=0.038) increased with the number of visits to CHS. Further, more participants who visited CHS more often reported a purpose for refilling medications, compared to those who visited less frequently (p=0.012). After controlling for sex, insurance status and income, multiple logistic regression analysis revealed that, compared to the age group 18-39, those aged over 60 were significantly more likely to have reported the purpose of refilling medication at CHS (AOR=5.59, 95%CI 2.62-11.92), and that PCPs cared about their mental health (AOR=2.04, 95%CI 1.00-4.13). Visiting over 10 times in the last year had a significant positive correlation with reporting PCPs caring about their mental health (AOR=3.42, 95%CI 1.33-8.81), keeping a good relationship (AOR=3.08, 95%CI 1.23-7.69) and putting patients' interests as the priority (AOR=2.97, 95%CI 1.19-7.39), compared to those who paid 1-3 visits. However, only 43 (9.3%, 95%CI 7.0%-12.3%) reported that over 75% of their medical problems were managed by PCPs and 60.2% reported that 50% or less of their medical problems were managed by PCPs when they felt ill and sought help from a doctor.

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Table 4 Community health service users' experiences and their views of primary care providers by number of visits to CHS. N=464

| | | Total(%) | | Number of visits to CHS[b] (times) | | | | | | | | p-value |
				1-3(%)		4-6(%)		7-10(%)		Over 10(%)		
I have a regular doctor	Agree	244[c]	(54.8)	134	(50.2)	41	(56.9)	17	(60.7)	32	(69.6)	0.106
	Disagree	201	(45.2)	133	(49.8)	31	(43.1)	11	(39.3)	14	(30.4)	
One main reason I go to a PCP[a] is to seek their professional advice	Agree	292	(65.8)	174	(65.7)	52	(73.2)	19	(67.9)	26	(54.2)	0.321
	Disagree	152	(34.2)	91	(34.3)	19	(26.8)	9	(32.1)	22	(45.8)	
One main reason I go to a PCP is to buy or refill some medications	Agree	248	(55.9)	135	(50.9)	44	(62.0)	16	(57.1)	37	(77.1)	0.012
	Disagree	196	(44.1)	130	(49.1)	27	(38.0)	12	(42.9)	11	(22.9)	
PCPs are polite to me	Agree	379	(84.8)	221	(82.5)	62	(84.9)	25	(89.3)	45	(95.7)	0.202
	Disagree	68	(15.2)	47	(17.5)	11	(15.1)	3	(10.7)	2	(4.3)	
PCPs listen to me carefully when I talk about my illness	Agree	389	(87.0)	229	(85.8)	67	(91.8)	23	(82.1)	44	(91.7)	0.460
	Disagree	58	(13.0)	38	(14.2)	6	(8.2)	5	(17.9)	4	(8.3)	
PCPs explain to me patiently (e.g. my disease, management plan, drug adverse effects etc.)	Agree	360	(80.7)	209	(78.0)	61	(83.6)	21	(77.8)	41	(87.2)	0.294
	Disagree	86	(19.3)	59	(22.0)	12	(16.4)	6	(22.2)	6	(12.8)	
PCPs care about my mental health	Agree	292	(65.2)	164	(61.2)	45	(61.6)	18	(64.3)	42	(87.5)	0.008
	Disagree	156	(34.8)	104	(38.8)	28	(38.4)	10	(35.7)	6	(12.5)	
PCPs are empathetic	Agree	314	(70.4)	187	(69.8)	48	(66.7)	20	(71.4)	39	(83.0)	0.327

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(e.g. my worries and mood etc.)	Disagree	132	(29.6)	81	(30.2)	24	(33.3)	8	(28.6)	8	(17.0)	
PCPs keep a good relationship with	Agree	309	(69.3)	174	(65.2)	52	(71.2)	20	(71.4)	40	(85.1)	0.085
me	Disagree	137	(30.7)	93	(34.8)	21	(28.8)	8	(28.6)	7	(14.9)	
PCPs put patients' interests at first	Agree	310	(69.5)	175	(65.5)	54	(74.0)	22	(78.6)	40	(85.1)	0.038
place	Disagree	136	(30.5)	92	(34.5)	19	(26.0)	6	(21.4)	7	(14.9)	

[a] PCP: primary care provider; [b] CHS: community health services

[c] The numbers do not add up because of missing values in some of the responses.

Discussion

Demand of hospital-based outpatient services is much higher than the community-based outpatient services indicating a wastage of health resources. In a healthcare system which allows a large degree of freedom to choose any health institution for healthcare, patients choose hospitals which they think can provide better care. A minority thought that PCPs managed over 75% of their medical problems, indicating a widespread lack of confidence in PCPs' competence. Many participants perceived PCPs as inferior in managing diseases of specific organ systems than specialists. Their perceptions might also be affected by historical factors. PCPs were deemed not different from barefoot doctors who, although with inadequate training, met basic healthcare needs of the rural population from 1960s to 1980s but less so at the present time. The bad experiences, such as not getting satisfactory explanations from a PCP, reinforced such perceptions.

Inadequate formal medical education and training for PCPs is an underlying problem. In 2013, around 76% of PCPs in urban community health facilities obtained 3 or more years of formal medical education and this compared to 90% of hospital specialists. [17] Doctors' showing clinical competence is critical to gaining patients' trust which lays a foundation for a healthy doctor-patient relationship.[18] Improving PCPs' competence through bettering the primary care education system is a top priority for building a strong primary care system and the subsequent success of health reforms in China.

Besides, those with higher household income and urban residents covered by URMI and UEMI were more likely to use hospital-based services. People may be inclined to put their preference into practice when the financial constraints are reduced or removed. The NCMI appears to have no impact on their utilization of hospital-based clinic. This might be due to the lower

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reimbursement rate for self-referred patients at hospitals and poorer out-of-pocket payment

capacity by rural-to-urban migrants. Patients with chronic diseases need long-term care which

generally increases the chances for visiting doctors in both hospitals and CHS.

One perceived function of CHS in the public's eyes is minor illness management. However, the

public's understanding may be greatly different from the professionals' views. Common

conditions, such as fevers and abdominal discomfort, most of which are minor, are considered by

some patients as conditions that need hospital specialists' consultations or diagnostic tests to

confirm the causes and management plans. CHS is also considered a referral agency which could

advise patients of a preferred hospital specialist. This is a positive trend because, if the public are

willing to accept CHS as a referral body, to some extent, CHS can function as a gatekeeper and

coordinator. Helping patients make better informed decisions of seeing appropriate specialists

has the potential to reduce unnecessary care considerably.

Other roles of CHS, which are well accepted by the public, include drug dispensing, managing

patients with chronic diseases and patient education. Although the service users lack confidence

in CHS as a provider of first-contact care,[9] providing aforementioned quality services to patients

in need can gradually build up a rapport with the patients, and regain trust. As our survey

identifies, more contact with PCPs may contribute to positive public opinions towards PCPs

regardless of the reasons for encounters. Strengthening these functions are likely to be a good

starting point for CHS to attract and keep patients in primary care. Nevertheless, frequent report

for refilling medications may not be clinically indicated and whether there are unnecessary visits

due to refilling medications are worth further examination. Also, "Tuo er" mentioned by one

participant indicates that a deep distrust in PCPs' integrity in acting as a coordinator may exist,

which may be worth further actions.

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This study has some strengths and limitations. The data were collected in a developed urban city where hospitals are easily accessible to the general public. The study findings only relate to Zhejiang province and may not be generalizable to less developed, rural areas. However, as one of the earliest health reform pilot cities, Hangzhou has developed a highly accessible and affordable primary care system. The findings provide a snapshot of the public's healthcare utilization patterns in the context of an intensive healthcare reform. Then a self-administered questionnaire might introduce recall bias regarding past experiences. We designed the experience questions using ranges to make it easier to respond. The items on their views and attitudes are subjective in nature and concerns about recall bias are inconsequential. Further, our qualitative study enables us to acquire an in-depth understanding of their thoughts.

Conclusion

The study aimed to investigate the public's views towards CHS and their healthcare utilization experiences. Both community- and hospital-based outpatient services are heavily consumed with the latter being used by more respondents. The public's perceptions of PCPs reflect a deep distrust in their competence. The distrust places a huge obstacle to CHS assuming the role of first-contact care provider. Nevertheless, other functions like making referrals, providing follow-up care and health education are well accepted and can be a good starting point for CHS to earn public trust. The gatekeeping role shall be gradually adopted by CHS after a strong primary care workforce is established by a primary care oriented education system.

Conflict of interests

The authors declared no conflict of interests.

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Ethics approval

Ethical approvals were obtained from the Review Boards of The University of Hong Kong/Hospital Authority Hong Kong West Cluster (UW14-567) and Zhejiang University (ZGL201410H) respectively.

Contributors

This research formed part of DW's PhD project. DW, TPL, and XDZ designed the study and the questionnaire. DW and XDZ coordinated fieldwork and collected data. DW, SKS and KFL performed the data analysis. DW, SKS and TPL interpreted the analysis. DW, SKS and TPL drafted the manuscript. All authors reviewed, revised, and approved the final manuscript.

Data sharing statement

Our study also collected data from medical professionals. These data are not published and are available to the corresponding author and the research team only.

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Appendix 1 The public's views towards the roles of community health services

Perceived roles of community health services	Quotes
Drug dispensers	1. It feels just like a drug store. It is exactly the same nature. Drug stores are similar [to community health facilities] and they are licensed too. (Group3, P4) 2. I would request the drugs I want and he [the primary care provider] then prescribes it. If I need to see a doctor for illness, I would go to a hospital. (Individual, P4)
Minor illness management	3. When I feel that I have a cough and running nose, I don't think I have to go to a big hospital. Then [I could go to] a community facility and the doctor can prescribe me some medications to treat my sore throat or my symptoms. If you are talking about severe conditions, they indeed cannot deal with them. (Group3, P5) 4. If you have fevers, you definitely need to go to a big hospital. (Group3, P3) 5. [I] usually come here [the community facility] for common colds or fevers. For major illnesses, I go to hospitals, such as hepatitis, cancer, or something in the abdomen. (Individual, P6)
Elderly care and chronic disease management	6. Community [health facilities] cannot deal with urgent cases after all. I think they can provide daily care to elderly patients and manage chronic diseases. (Individual, P11) 7. Community [health facilities] can refill my medications as I have needs to take medications for diabetes and hypertension for a long time and it is too troublesome to go to a hospital for refilling medications. (Group3, P5) 8. Even if we go [to the community facility], they cannot identify the diagnosis. If they were able to diagnose my diabetes, of course I would go. They can identify hypertension but they don't know what medications to use. It's like the [primary care] doctor is not able to prescribe [the right drug] and he could only prescribe according to what a hospital specialist has prescribed to me. He would say that "the hospital hasn't prescribed [the drug before], so I dare not prescribe this." (Individual, P1)
Patient education	9. Nowadays, people pay more attention to their health. They [community health facilities], I think, should do a lot of health education and improve the public's lifestyle, such as forming healthy living habits. Lifestyle like how much salt and oil one should consume. Some of these are very minor issues, but if you repeat more often, they can become

	people's common sense, such as low-salt, low-fat diet, and exercise every day. The community facilities' role of health education is irreplaceable. (Individual, P11)
Referral body	10. Maybe average people would consult [doctors] in the community to figure out which specialty they need to see first. (Individual, P11)
	11. [Community health facilities] can sometimes make an initial assessment for you, like what problem you might have and where you need to take a test. Then you know where to target and you don't have to look around when you go to [a hospital in] the city. It is more convenient and you know which specialty to see, internal medicine, surgery, neurology or whatever. It is much more convenient than before. (Group6, P1)
	12. If he helps me make an appointment, I would be suspicious. I cannot help thinking if he is a "tuo er". There is a possibility that they may take kickbacks. The other doctor liaised by him may be his relative. I heard this from others because there are too many such reports. (Individual, P10)

Appendix 2 The public's perceptions of primary care providers

Perceptions of primary care providers (PCPs)	Quotes
Barefoot doctors	1. I think PCPs should know a wide range of diseases, including internal medicine, surgery or dermatology. This is how I understand it—knowing a bit about every specialty. PCPs are like barefoot doctors. They cannot deal with many problems and he will suggest you go to a hospital. (Group3, P2)
San jiao mao	2. Using our dialect, he [a PCP] is like "san jiao mao", i.e., a barefoot doctor. It means that he knows a little bit about everything. But, offensively, when you ask further medical questions, he doesn't know [about the illness] or about the medications. (Group3, P5)
Wan jin you	3. PCPs are "wan jin you". They are just like "jack of all trades and master of none". We locals think this way. (Individual, P11)
Patient-dominance in the PCP-patient relationship	4. When I go to see a PCP, it's up to me to decide what medications I need. (Group1, P1) 5. For example, if I have a common cold then I would say [to the doctor], "Tylenol" (a domestic type of paracetamol). That's it. He is not the doctor. I am the doctor. (Gp3, P3)
Public distrust	6. Honestly, if you really ask a PCP to explain the details about certain drugs or what side effects the drugs would have, in most cases, he cannot tell. If you ask him why he prescribe this medication to me, he would say "everyone prescribes this then I also prescribe this" or "our facility has this medicine only". He just gives such an explanation. (Group5, P1) 7. I had a surgery on my leg this year and I had my dressing changed [at the PCP's clinic]. Honestly, the PCP was like that he cannot even target my wound. I can even do it better than he does. These are called PCPs. I would put a question mark. These people may not be well trained and educated. (Group4, P3)

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Public views towards community health and hospital-based outpatient services and their utilization in Zhejiang, China – A mixed methods study

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Title: Public views towards community health and hospital-based outpatient services and their utilization in Zhejiang, China – A mixed methods study

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Abstract

Objective: China is engaged in promoting community health services (CHS) nationwide. This study examines the public's views towards CHS and their utilization of community- and hospital-based outpatient services.

Design: A mixed-methods study using qualitative interviews and a cross-sectional survey.

Study setting and participants: The study was conducted among the public between September 2014 and September 2015 in Zhejiang province, China. Six focus groups and thirteen individuals were interviewed. The questionnaire was completed by 1248 respondents (response rate: 83%).

Primary outcome measures: Utilization of community- and hospital-based outpatient services.

Results: Functions of CHS perceived by the public included provision of minor illness management, coordination, drug dispensing, follow-up care, and patient education. However, many also showed a distrust in primary care providers' (PCPs) competence for confirming the initial diagnosis and management plan. As coordinators, PCPs' integrity was challenged and PCPs were thought to be potential "tuo er" (cunning agents who tried to lead patients to some notorious hospitals to make money).

Survey results showed that 800 (64.1%) respondents visited hospital-based clinics and 688 (55.1%) visited CHS at least once in the past year. Compared to the uninsured group, those covered by Urban Resident Medical Insurance (adjusted odds ratio or AOR=1.95, 95%CI 1.24-3.07) and Urban Employee Medical Insurance (AOR=2.59, 95%CI 1.59-4.24) were more likely to use hospital-based services. Respondents who had a chronic condition were more likely than their counterparts to use both hospital-based services (AOR=1.72, 95%CI 1.18-2.49) and CHS (AOR=1.66, 95%CI 1.19-2.32). Income levels were positively associated with the likelihood of

visiting hospital-based clinics (AOR=1.67, 95%CI 1.15-2.42) but negatively associated with the likelihood of using CHS (AOR=0.68, 95%CI 0.48-0.96).

Conclusions: Demand of hospital-based outpatient services is much higher than the community-based outpatient services. Policy reformers need to take further actions to address the public distrust in PCPs to facilitate their gatekeeping role.

Strengths and limitations of this study

- Our qualitative part provided the in-depth views of service users towards the community health services.

- The quantitative data triangulated the qualitative findings using a follow up cross-sectional survey approach.

- The study mapped out the public's utilization of both community- and hospital-based outpatient services in a free market style healthcare system in the urban setting.

- The study was conducted in a pioneer city implementing the national healthcare reforms and provided references to other areas of China with similar situations.

- The quantitative part of the study was a self-administered questionnaire survey which might introduce recall bias regarding past experiences.

Introduction

China has a three-tier healthcare system in which secondary and tertiary hospitals are supposed to provide specialized care while community health facilities provide primary care and preventive services. However, patients embrace the freedom to choose any level of care facility and direct access to specialist care without referrals by primary care doctors. The country has been engaged in a massive healthcare reform since 2009. Strengthening primary care system and diverting patients with common diseases from hospital-based care to community-based care is one of the top five priorities of the reform. [1] Nevertheless, the reform would not be successful if the voices of the service users are ignored.

Previous research focused on patients' satisfaction in health services, including primary care. [2-5] Other studies attempted to explore *patients'* willingness to choose community health services (CHS) for first-contact care, of which percentages ranged between 62% and 70%,[6-8] but our recent study found 70% of the respondents sampled from the general *public* preferred hospital-based services for first-contact care.[9] Associated factors included patient's age, sex, education level, insurance status, awareness of CHS, and self-perceived severity of diseases.[7,8,10,11] Better accessibility and affordability were considered as strengths of CHS.[12] A few studies reported patients' concerns about the competence of primary care providers (PCPs) and quality of diagnostic equipment.[9,13-15] The general public's in-depth views towards CHS are, however, lacking.

This study is part of a larger project examining how to better promote primary care in China using a combined qualitative and quantitative approach. The first aim of this article was to examine the general public's views towards the roles of CHS through the qualitative study. In China, PCPs refer to any type of medical practitioners, regardless of educational attainment,

providing primary care in the community. PCPs include general practitioners (GPs who have three-year or five-year medical education and are specialized in general practice through general practice training programs), barefoot doctors (3 to 6 months of basic medical training), and other medical practitioners providing primary care in the community setting. Because the service users are free to choose between facilities, it is possible that they seek medical help from multiple resources. The second aim was to investigate through a questionnaire survey their utilization of community- and hospital-based outpatient services in the year prior to the study, with a focus on the former. Since China's previous primary care system established between 1960s and 1980s has been a successful model for lower- and middle-income countries,[16] the Chinese experiences are relevant to other countries.

Methods

The study method was described elsewhere.[9] Data were collected from the general public living in the eight districts of central Hangzhou, with a population of 6.95 million, in Zhejiang province.

Qualitative approach

Sampling and data collection
We adopted both individual and focus group interviews to triangulate data. We purposefully sampled participants with diverse backgrounds for interviews. For individual interviews, we recruited participants from different age groups, with different education levels, income levels, and whether diagnosed as having chronic conditions or not. Group interviews were mainly arranged based on age groups with flexibility allowed. We identified a local researcher who had strong connections with local health authorities. We approached participants with the assistance of community workers.

Topic guides were developed for semi-structured interviews. This article focused on the participants' views of the roles of CHS and PCPs. Interviews were conducted between September 2014 and April 2015. Most interviews lasted around 60 minutes and were conducted in a quiet room in the community. Written consent was sought before the interview. Anonymity and confidentiality were stressed.

Data analysis

Interviews were audio-recorded and transcribed verbatim. One of the authors checked the accuracy of the transcripts. Data were analyzed using a thematic approach with the assistance of NVivo 10. Interview transcripts were double coded by two researchers to check for consistency and accuracy. Discrepancies were then discussed until consensus was reached. Afterwards, we organized and categorized codes into different themes/subthemes and further relevant questions were explored in subsequent interviews. We continued data collection until thematic saturation was reached. To ensure data validity, some key findings were triangulated by a follow-up survey. Quotes were translated from Chinese to English for the manuscript.

Quantitative approach

Sampling and data collection

A cross-sectional survey was conducted from July to September 2015. Multi-stage stratified random sampling was adopted. First, we stratified the eight districts to low, middle and high-income regions. One district from each stratum was then randomly selected. Second, two street districts were randomly selected from each district. Then, four communities/villages were randomly selected from each sampled street district, making it a total of 24 survey sites. Lastly, individuals were approached with the assistance of the community workers, and we invited one

out of every 10 pedestrians who passed by our survey site in the community. We recruited 45 to 50 respondents from each site. Anonymity was stressed and confidentiality was strictly protected.

Questionnaire

The complete questionnaire has 64 items. We asked the participants about their social demographic characteristics, insurance scheme (New Cooperative Medical Insurance or NCMI, Urban Resident Medical Insurance or URMI, Urban Employee Medical Insurance or UEMI, and commercial insurance), factors they consider for finding sources of care, preferred source of care, use of outpatient services in the last year, expectations on medical professionals in the clinical setting, and views of CHS and PCPs. NCMI covered rural population. URMI covered people who were under 18 years old, the unemployed or poor, the disabled, and the elderly population, while UEMI covered employees in urban areas. In this article, we reported the public's utilization of CHS and hospital-based clinics in the last year and the correlates. Experiences and views of community-based services were asked using four-point Likert scales (1 = completely disagree; 2 = somewhat disagree; 3= somewhat agree; 4 = completely agree). The questionnaire was piloted with 30 respondents to test its face- and content validity. The questionnaire aimed at investigating the attitudes and behaviors of the respondents, but did not serve as a composite measure of a certain domain. Hence it has not been validated against outcomes formally other than the face and content validity. Completing the questionnaire took 10 to 15 minutes. Amendments were made based on feedback.

Statistical analysis

The data were analyzed using IBM SPSS V.23. We had dichotomized the responses by grouping "completely agree and somewhat agree" as positive and "completely disagree and somewhat disagree" as negative response. Number of visits to CHS and hospitals were categorized as

binary outcome variables ("none" and "at least once"). Descriptive analysis was carried out.

Pearson Chi-squared tests were conducted to examine the differences in the views of PCPs by

age and number of visits to CHS in the last year. We ran simple logistic regression and multiple

logistic regression analyses to determine the factors (i.e., sex, age, income, health insurance

status and chronic conditions) for the use of health services and public opinions of PCPs. A p-

value < 0.05 is considered statistically significant.

Results

Qualitative results

Six focus group interviews were held. Each group comprised of 6 to 8 participants. Meanwhile,

13 semi-structured individual interviews were conducted. Among the participants, 44.4% were

males. The mean age of all participants was 52.6 (SD=17.0), with the age ranged from 24 to 87.

Views towards the roles of CHS and perceptions of PCPs were revealed.

Roles of community health services

Many participants perceived that CHS were like drug dispensers rather than a medical care

provider (Appendix 1, quotes 1 and 2). CHS were regarded as a source for dealing with minor

illnesses, such as common colds and skin abrasions (Appendix 1, quote 3). Nevertheless, the

public's perception of minor and urgent/serious conditions might be largely different from the

professionals' views and varied across different participants. For example, fevers and abdominal

discomfort were considered by some as conditions that need hospital specialist consultations to

confirm the causes (Appendix 1, quotes 4 and 5). When the interviewer prompted "what

proportion of your health problems can be dealt with by primary care providers", the responses

widely ranged from 20% to 90%.

Elderly patients with chronic diseases can be well managed in CHS (Appendix 1, quote 6). Some participants described it as a source for follow-up care for chronic diseases but not for confirming the initial diagnosis and management plan even for diabetes and hypertension (Appendix 1, quotes 7 and 8). A key role played by CHS was to provide general and public health education to the general public, as explained by a participant (Appendix 1, quote 9). The function of triaging or making referrals by CHS was also discussed by some participants. CHS could inform patients to make better decisions about which specialty to see or where to see a specialist (Appendix 1, quotes 10 and 11). Such a status quo was deemed by them as a step forward compared to the past (Appendix 1, quote 11). However, the lack of trust in PCPs' integrity might pose a challenge for this function. For the question "what would you think about a PCP making an appointment with hospital specialists for you, as a coordinator?", an interviewee responded that he would doubt if the PCP was a "tuo er"[a] (Appendix 1, quote 12).

Perceptions towards primary care providers

Many participants frankly expressed PCPs were like barefoot doctors with minimal formal medical education (Appendix 2, quote 1). The local dialects used were "san jiao mao" (a cat with three legs[b]) and "wan jin you" (Tiger Balm[c]), meaning that PCPs saw any diseases yet were not good at any kind of them (Appendix 2, quotes 2 and 3). In the doctor-patient relationship, patients sometimes appeared to play a dominant role and requested treatments (Appendix 2, quotes 4 and 5). Using "san jiao mao" or "wan jin you" as a metaphor to describe PCPs demonstrated a strong public distrust in the level of competence of PCPs (Appendix 2, quotes 6

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[a] "Tuo er" is a Beijing dialect which means a cunning agent who pretends to be a client and tries to deceive the real customers and lead them to buy their products. It exists in many industries. In health industry, it means an agent who tries to lead patients to some notorious hospitals to make money.

[b] A popular idiom in Yangtze River Delta. It means jack of all trades and master of none

[c] A Chinese relieving ointment which can be applied for many conditions such as skin itchiness, headache, rheumatic pains, and diarrhea etc., leading to mild relief but not curing the diseases.

and 7). One major cause was the participants' belief that PCPs were inadequately educated and trained (Appendix 2, quote 7).

Survey results

A total of 1248 respondents completed the questionnaire. The overall response rate was 83%. Nearly half (49.4%) of the respondents were female. There were 132 (10.6%) aged 60 or above. Five hundred and four (40.4%) obtained post-secondary or higher education and 393 (31.5%) reported a monthly household income of 10,000 Yuan or above. Nearly one-fourth (325, 26.0%) were covered by NCMI, 388 (31.1%) were covered by URMI, and 272 (21.8%) were covered by UEMI. Over one-fifth (265, 21.2%) had a chronic condition. Details of their demographic characteristics have been reported elsewhere.[9] The majority (800, 64.1%, 95%CI 61.4%-66.7%) visited hospital-based clinics in the past year. Less (688, 55.1%, 95%CI 52.4%-57.9%) visited community-based clinics, 507 (74.2%) of whom also visited hospital clinics in the past year. Detailed distribution of the number of visits to the two types of clinic are shown in Table 1.

Table 1 Visits to community- and hospital-based services in the year prior to the survey. N=1248

Number of visits (times)	0(%)		1-3(%)		4-6(%)		7-10(%)		>10(%)		Missing	
Community health facilities	485	(38.9)	455	(36.5)	125	(10.0)	42	(3.4)	66	(5.3)	75	(6.0)
Hospital outpatient clinics	376	(30.1)	557	(44.6)	154	(12.3)	41	(3.3)	48	(3.8)	72	(5.8)

Table 2 shows the associations between individual characteristics and the outpatient services

utilization based on the simple and multiple logistic regression analyses. Compared to the

uninsured group, those covered by URMI (adjusted odds ratio or AOR=1.95, 95%CI: 1.24-3.07)

and UEMI (AOR=2.59, 95%CI: 1.59-4.24) were significantly more likely to use hospital-based

services. Those who reported the highest household income (AOR=1.67, 95%CI: 1.15-2.42) and

a diagnosis of chronic illnesses (AOR=1.72, 95%CI: 1.18-2.49) were more likely to use hospital-

based services. In relation to community-based services, reporting a diagnosis of chronic

illnesses was significantly associated with the utilization (AOR=1.66, 95%CI: 1.19-2.32)

whereas the likelihood significantly decreased with income levels (AOR=0.68, 95%CI: 0.48-

0.96).

Table 2 Correlates of use of hospital- and community-based outpatient services

	Odds Ratio and Adjusted Odds Ratio of visiting a hospital specialist last year at least once		Odds Ratio and Adjusted Odds Ratio of visiting a community-based clinic last year at least once	
	OR(95% CI)	AOR(95% CI)	OR(95% CI)	AOR(95% CI)
Sex				
Male	1	1	1	1
Female	1.19(0.93,1.53)	1.16(0.88,1.52)	1.29(1.02,1.63) *	1.26(0.98,1.62)
Age				
18-39	1	1	1	1
40-59	1.20(0.89,1.62)	1.11(0.79,1.55)	1.09(0.82,1.44)	0.94(0.69,1.28)
60 or above	1.16(0.77,1.74)	0.70(0.43,1.14)	1.48(0.99,2.20)	1.16(0.73,1.84)
Insurance status				
Uninsured	1	1	1	1
NCMI[a]	0.99(0.65,1.49)	1.08(0.69,1.68)	1.19(0.79,1.80)	1.27(0.81,1.97)
URMI[b]	1.99(1.31,3.01)**	1.95(1.24,3.07)**	1.26(0.84,1.88)	1.30(0.84,2.02)
UEMI[c]	2.45(1.56,3.85)***	2.59(1.59,4.24) ***	1.14(0.75,1.74)	1.22(0.77,1.92)
Commercial insurance	1.07(0.55,2.08)	1.03(0.51,2.08)	0.89(0.46,1.71)	0.97(0.49,1.94)
Monthly household income (Yuan)				
< 4000	1	1	1	1
4000-9999	1.19(0.88,1.62)	1.09(0.78,1.52)	0.78(0.58,1.06)	0.76(0.55,1.05)
>10000	1.85(1.33,2.58)***	1.67(1.15,2.42) **	0.63(0.46,0.86)**	0.68(0.48,0.96) *
Chronic illness diagnosis				
No	1	1	1	1
Yes	1.70(1.23,2.34)**	1.72(1.18,2.49) **	1.68(1.25,2.25)**	1.66(1.19,2.32) **

[a]NCMI: new cooperative medical insurance; [b]URMI: urban resident medical insurance; [c]UEMI: urban employee medical insurance

Model fit descriptions for multiple logistic regression analysis: p values of Hosmer and Lemeshow test respectively for the two dependent variables are 0.456 and 0.454, indicating that the models fit the data well.

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

Among the 688 CHS users, 464 (67.4%) offered comments about their experiences of using CHS (Table 3). Over half of them (54.3%) reported that they had a regular PCP, with significantly more respondents aged 60 or above reporting this than the other two age groups (p=0.020). Main reasons for visiting a community-based practitioner were refilling medications (56.0%) and seeking professional advice (65.0%). More from the elderly (84.7%) and middle aged (64.2%) groups than the youngest group (45.0%) went to CHS to buy or refill medications (p<0.001). Almost 85% said that PCPs were polite to them. Up to 87.3% reported that PCPs listened to patients carefully. Nearly 81% reported that PCPs explained the disease, management plan and drug adverse effects patiently. About two thirds said that PCPs cared about their mental health (66%), were empathetic (70.3%), tried to keep a good relationship with the patient (69.3%) and put patients' interests at the first place (68.9%).

Table 3 Community health service users' experiences and their views of primary care providers by age. N=464

		Total(%)		Age						p-value (χ2 test)
				18-39(%)		40-59(%)		60 or above(%)		
I have a regular doctor.	Agree	246[b]	(54.3)	135	(50.2)	61	(55.0)	50	(68.5)	0.020
	Disagree	207	(45.7)	134	(49.8)	50	(45.0)	23	(31.5)	
One main reason I go to a PCP[a] is to seek their professional advice.	Agree	294	(65.0)	187	(69.0)	66	(60.0)	41	(57.7)	0.092
	Disagree	158	(35.0)	84	(31.0)	44	(40.0)	30	(42.3)	
One main reason I go to a PCP is to buy or refill some medications.	Agree	253	(56.0)	122	(45.0)	70	(64.2)	61	(84.7)	0.000
	Disagree	199	(44.0)	149	(55.0)	39	(35.8)	11	(15.3)	
PCPs are polite to me	Agree	385	(84.6)	218	(80.7)	100	(89.3)	67	(91.8)	0.020
	Disagree	70	(15.4)	52	(19.3)	12	(10.7)	6	(8.2)	
PCPs listen to me carefully when I talk about my illness	Agree	397	(87.3)	233	(86.3)	101	(90.2)	63	(86.3)	0.565
	Disagree	58	(12.7)	37	(13.7)	11	(9.8)	10	(13.7)	
PCPs explain to me patiently (e.g. my disease, management plan, drug adverse effects etc.)	Agree	367	(80.8)	211	(78.4)	94	(83.9)	62	(84.9)	0.289
	Disagree	87	(19.2)	58	(21.6)	18	(16.1)	11	(15.1)	
PCPs care about my mental health (e.g. my worries and mood etc.)	Agree	301	(66)	168	(62.0)	75	(67.0)	58	(79.5)	0.020
	Disagree	155	(34.0)	103	(38.0)	37	(33.0)	15	(20.5)	
PCPs are empathetic.	Agree	319	(70.3)	183	(67.5)	79	(70.5)	57	(80.3)	0.112
	Disagree	135	(29.7)	88	(32.5)	33	(29.5)	14	(19.7)	
PCPs keep a good relationship with me.	Agree	314	(69.3)	181	(66.8)	77	(70.0)	56	(77.8)	0.196
	Disagree	139	(30.7)	90	(33.2)	33	(30.0)	16	(22.2)	
PCPs put patients' interests at first place.	Agree	312	(68.9)	178	(65.7)	79	(71.2)	55	(77.5)	0.135
	Disagree	141	(31.1)	93	(34.3)	32	(28.8)	16	(22.5)	

[a] PCP: primary care provider; [b] The numbers do not add up because of missing ages in some of the responses

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There were differences in their views by number of visits to CHS (Table 4). The percentages of

reporting PCPs caring about their mental health status (p=0.008), and putting patients' interests at

first place (p=0.038) increased with the number of visits to CHS. Further, participants who

visited CHS more often were more likely to report a purpose for refilling medications, compared

to those who visited less frequently (p=0.012).

Table 4 Community health service users' experiences and their views of primary care providers by number of visits to CHS. N=464

		Total(%)		1-3(%)		4-6(%)		7-10(%)		Over 10(%)		p-value
				Number of visits to CHS[b] (times)								
I have a regular doctor	Agree	244[c]	(54.8)	134	(50.2)	41	(56.9)	17	(60.7)	32	(69.6)	0.106
	Disagree	201	(45.2)	133	(49.8)	31	(43.1)	11	(39.3)	14	(30.4)	
One main reason I go to a PCP[a] is to seek their professional advice	Agree	292	(65.8)	174	(65.7)	52	(73.2)	19	(67.9)	26	(54.2)	0.321
	Disagree	152	(34.2)	91	(34.3)	19	(26.8)	9	(32.1)	22	(45.8)	
One main reason I go to a PCP is to buy or refill some medications	Agree	248	(55.9)	135	(50.9)	44	(62.0)	16	(57.1)	37	(77.1)	0.012
	Disagree	196	(44.1)	130	(49.1)	27	(38.0)	12	(42.9)	11	(22.9)	
PCPs are polite to me	Agree	379	(84.8)	221	(82.5)	62	(84.9)	25	(89.3)	45	(95.7)	0.202
	Disagree	68	(15.2)	47	(17.5)	11	(15.1)	3	(10.7)	2	(4.3)	
PCPs listen to me carefully when I talk about my illness	Agree	389	(87.0)	229	(85.8)	67	(91.8)	23	(82.1)	44	(91.7)	0.460
	Disagree	58	(13.0)	38	(14.2)	6	(8.2)	5	(17.9)	4	(8.3)	
PCPs explain to me patiently (e.g. my disease, management plan, drug adverse effects etc.)	Agree	360	(80.7)	209	(78.0)	61	(83.6)	21	(77.8)	41	(87.2)	0.294
	Disagree	86	(19.3)	59	(22.0)	12	(16.4)	6	(22.2)	6	(12.8)	
PCPs care about my mental health	Agree	292	(65.2)	164	(61.2)	45	(61.6)	18	(64.3)	42	(87.5)	0.008
	Disagree	156	(34.8)	104	(38.8)	28	(38.4)	10	(35.7)	6	(12.5)	

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PCPs are empathetic	Agree	314	(70.4)	187	(69.8)	48	(66.7)	20	(71.4)	39	(83.0)	0.327
(e.g. my worries and mood etc.)	Disagree	132	(29.6)	81	(30.2)	24	(33.3)	8	(28.6)	8	(17.0)	
PCPs keep a good relationship with me	Agree	309	(69.3)	174	(65.2)	52	(71.2)	20	(71.4)	40	(85.1)	0.085
	Disagree	137	(30.7)	93	(34.8)	21	(28.8)	8	(28.6)	7	(14.9)	
PCPs put patients' interests at first place	Agree	310	(69.5)	175	(65.5)	54	(74.0)	22	(78.6)	40	(85.1)	0.038
	Disagree	136	(30.5)	92	(34.5)	19	(26.0)	6	(21.4)	7	(14.9)	

[a] PCP: primary care provider; [b] CHS: community health services

[c] The numbers do not add up because of missing values in some of the responses.

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After controlling for sex, insurance status and income, multiple logistic regression analysis

revealed that, compared to the age group 18-39, those aged over 60 were significantly more

likely to have reported the purpose of refilling medication at CHS (AOR=5.59, 95%CI 2.62-

11.92), and that PCPs cared about their mental health (AOR=2.04, 95%CI 1.00-4.13). Visiting

over 10 times in the last year had a significant positive correlation with reporting PCPs caring

about their mental health (AOR=3.42, 95%CI 1.33-8.81), keeping a good relationship

(AOR=3.08, 95%CI 1.23-7.69) and putting patients' interests as the priority (AOR=2.97, 95%CI

1.19-7.39), compared to those who paid 1-3 visits. However, only 43 (9.3%) reported that over

75% of their medical problems were managed by PCPs and 60.2% reported that 50% or less of

their medical problems were managed by PCPs when they felt ill and sought help from a doctor.

Discussion

Demand of hospital-based outpatient services is much higher than the community-based

outpatient services indicating a wastage of health resources. In a healthcare system which allows

a large degree of freedom to choose any health institution for healthcare, patients choose

hospitals which they think can provide better care. Only a minority thought that PCPs managed

over 75% of their medical problems, indicating a widespread lack of confidence in PCPs'

competence. Many participants perceived PCPs as inferior in managing diseases of specific

organ systems than specialists. Their perceptions might also be affected by historical factors.

PCPs were deemed not different from barefoot doctors who, although with inadequate training,

met basic healthcare needs of the rural population from 1960s to 1980s but less so at the present

time. The bad experiences, such as not getting satisfactory explanations from a PCP, reinforced

such perceptions.

Inadequate formal medical education and training for PCPs is an underlying problem. In 2013, around 76% of PCPs in urban community health facilities obtained 3 or more years of formal medical education and this compared to 90% of hospital specialists. [17] Doctors' showing clinical competence is critical to gaining patients' trust which lays a foundation for a healthy doctor-patient relationship.[18] Improving PCPs' competence through bettering the primary care education system is a top priority for building a strong primary care system and the subsequent success of health reforms in China.

Besides, those with higher household income and urban residents covered by URMI and UEMI were more likely to use hospital-based services. People may be inclined to put their preference into practice when they can afford the service. The NCMI appears to have no impact on their utilization of hospital-based clinic. This might be due to the lower reimbursement rate for self-referred patients at hospitals and poorer out-of-pocket payment capacity by rural-to-urban migrants. Patients with chronic diseases need long-term care which generally increases the need for visiting doctors in both hospitals and CHS. It is particularly so for elderly patients who were more likely to develop chronic conditions, hence leading to more visits to CHS.

One perceived function of CHS in the public's eyes is minor illness management. However, the public's understanding may be greatly different from the professionals' views. Common conditions, such as fevers and abdominal discomfort, most of which are minor, are considered by some patients as conditions that need hospital specialists' consultations or diagnostic tests to confirm the causes and management plans. CHS is also considered a referral agency which could advise patients of a preferred hospital specialist. This is a positive trend because, if the public are willing to accept CHS as a referral body, to some extent, CHS can function as a gatekeeper and

coordinator. Helping patients make better informed decisions of seeing appropriate specialists has the potential to reduce unnecessary care considerably.

Other roles of CHS, which are well accepted by the public, include drug dispensing, managing patients with chronic diseases and patient education. Although the service users lack confidence in CHS as a provider of first-contact care,[9] providing aforementioned quality services to patients in need can gradually build up a rapport with the patients, and regain trust. As our survey identifies, more contact with PCPs may contribute to positive public opinions towards PCPs regardless of the reasons for encounters. Strengthening these functions are likely to be a good starting point for CHS to attract and keep patients in primary care. Nevertheless, frequent report for refilling medications may not be clinically indicated and whether there are unnecessary visits due to refilling medications are worth further examination. Also, "Tuo er" mentioned by one participant indicates that a deep distrust in PCPs' integrity in acting as a coordinator may exist, which may be worth further actions.

This study has some strengths and limitations. The data were collected in a developed urban city where hospitals are easily accessible to the general public. The study findings only relate to Zhejiang province and may not be generalizable to less developed, rural areas. However, as one of the earliest health reform pilot cities, Hangzhou has developed a highly accessible and affordable primary care system. The findings provide a snapshot of the public's healthcare utilization patterns in the context of an intensive healthcare reform. Then a self-administered questionnaire might introduce recall bias regarding past experiences. We designed the experience questions using ranges to make it easier to respond. The items on their views and attitudes are subjective in nature and concerns about recall bias are inconsequential. Further, our qualitative study enables us to acquire an in-depth understanding of their thoughts.

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Conclusion

The study aimed to investigate the public's views towards CHS and their healthcare utilization experiences. Demand of hospital-based outpatient services is much higher than the community-based outpatient services. The public's perceptions of PCPs reflect a deep distrust in their competence. The distrust places a huge obstacle to CHS assuming the role of first-contact care provider. Nevertheless, other functions like making referrals, providing follow-up care and health education are well accepted and can be a good starting point for CHS to earn public trust. The gatekeeping role shall be gradually adopted by CHS after a strong primary care workforce is established by a primary care oriented education system.

Conflict of interests

The authors declared no conflict of interests.

Ethics approval

Ethical approvals were obtained from the Review Boards of The University of Hong Kong/Hospital Authority Hong Kong West Cluster (UW14-567) and Zhejiang University (ZGL201410H) respectively.

Contributors

This research formed part of DW's PhD project. DW, TPL, and XDZ designed the study and the questionnaire. DW and XDZ coordinated fieldwork and collected data. DW, SKS and KFL

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performed the data analysis. DW, SKS and TPL interpreted the analysis. DW, SKS and TPL

drafted the manuscript. All authors reviewed, revised, and approved the final manuscript.

Data sharing statement

Our study also collected data from medical professionals. These data are not published and are

available to the corresponding author and the research team only.

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Appendix 1 The public's views towards the roles of community health services

Perceived roles of community health services	Quotes
Drug dispensers	1. It feels just like a drug store. It is exactly the same nature. Drug stores are similar [to community health facilities] and they are licensed too. (Group3, P4) 2. I would request the drugs I want and he [the primary care provider] then prescribes it. If I need to see a doctor for illness, I would go to a hospital. (Individual, P4)
Minor illness management	3. When I feel that I have a cough and running nose, I don't think I have to go to a big hospital. Then [I could go to] a community facility and the doctor can prescribe me some medications to treat my sore throat or my symptoms. If you are talking about severe conditions, they indeed cannot deal with them. (Group3, P5) 4. If you have fevers, you definitely need to go to a big hospital. (Group3, P3) 5. [I] usually come here [the community facility] for common colds or fevers. For major illnesses, I go to hospitals, such as hepatitis, cancer, or something in the abdomen. (Individual, P6)
Elderly care and chronic disease management	6. Community [health facilities] cannot deal with urgent cases after all. I think they can provide daily care to elderly patients and manage chronic diseases. (Individual, P11) 7. Community [health facilities] can refill my medications as I have needs to take medications for diabetes and hypertension for a long time and it is too troublesome to go to a hospital for refilling medications. (Group3, P5) 8. Even if we go [to the community facility], they cannot identify the diagnosis. If they were able to diagnose my diabetes, of course I would go. They can identify hypertension but they don't know what medications to use. It's like the [primary care] doctor is not able to prescribe [the right drug] and he could only prescribe according to what a hospital specialist has prescribed to me. He would say that "the hospital hasn't prescribed [the drug before], so I dare not prescribe this." (Individual, P1)
Patient education	9. Nowadays, people pay more attention to their health. They [community health facilities], I think, should do a lot of health education and improve the public's lifestyle, such as forming healthy living habits. Lifestyle like how much salt and oil one should consume. Some of these are very minor issues, but if you repeat more often, they can become

	people's common sense, such as low-salt, low-fat diet, and exercise every day. The community facilities' role of health education is irreplaceable. (Individual, P11)
Referral body	10. Maybe average people would consult [doctors] in the community to figure out which specialty they need to see first. (Individual, P11) 11. [Community health facilities] can sometimes make an initial assessment for you, like what problem you might have and where you need to take a test. Then you know where to target and you don't have to look around when you go to [a hospital in] the city. It is more convenient and you know which specialty to see, internal medicine, surgery, neurology or whatever. It is much more convenient than before. (Group6, P1) 12. If he helps me make an appointment, I would be suspicious. I cannot help thinking if he is a "tuo er". There is a possibility that they may take kickbacks. The other doctor liaised by him may be his relative. I heard this from others because there are too many such reports. (Individual, P10)

Appendix 2 The public's perceptions of primary care providers

Perceptions of primary care providers (PCPs)	Quotes
Barefoot doctors	1. I think PCPs should know a wide range of diseases, including internal medicine, surgery or dermatology. This is how I understand it—knowing a bit about every specialty. PCPs are like barefoot doctors. They cannot deal with many problems and he will suggest you go to a hospital. (Group3, P2)
San jiao mao	2. Using our dialect, he [a PCP] is like "san jiao mao", i.e., a barefoot doctor. It means that he knows a little bit about everything. But, offensively, when you ask further medical questions, he doesn't know [about the illness] or about the medications. (Group3, P5)
Wan jin you	3. PCPs are "wan jin you". They are just like "jack of all trades and master of none". We locals think this way. (Individual, P11)
Patient-dominance in the PCP-patient relationship	4. When I go to see a PCP, it's up to me to decide what medications I need. (Group1, P1) 5. For example, if I have a common cold then I would say [to the doctor], "Tylenol" (a domestic type of paracetamol). That's it. He is not the doctor. I am the doctor. (Gp3, P3)
Public distrust	6. Honestly, if you really ask a PCP to explain the details about certain drugs or what side effects the drugs would have, in most cases, he cannot tell. If you ask him why he prescribe this medication to me, he would say "everyone prescribes this then I also prescribe this" or "our facility has this medicine only". He just gives such an explanation. (Group5, P1) 7. I had a surgery on my leg this year and I had my dressing changed [at the PCP's clinic]. Honestly, the PCP was like that he cannot even target my wound. I can even do it better than he does. These are called PCPs. I would put a question mark. These people may not be well trained and educated. (Group4, P3)

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Title: Public views towards community health and hospital-based outpatient services and their utilization in Zhejiang, China – A mixed methods study

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Abstract

Objective: China is engaged in promoting community health services (CHS) nationwide. This study examines the public's views towards CHS and their utilization of community- and hospital-based outpatient services.

Design: A mixed-methods study using qualitative interviews and a cross-sectional survey.

Study setting and participants: The study was conducted among the public between September 2014 and September 2015 in Zhejiang province, China. Six focus groups and thirteen individuals were interviewed. The questionnaire was completed by 1248 respondents (response rate: 83%).

Primary outcome measures: Utilization of community- and hospital-based outpatient services.

Results: Functions of CHS perceived by the public included provision of minor illness management, coordination, drug dispensing, follow-up care, and patient education. However, many also showed a distrust in primary care providers' (PCPs) competence for confirming the initial diagnosis and management plan. As coordinators, PCPs' integrity was challenged and PCPs were thought to be potential "tuo er" (cunning agents who tried to lead patients to some notorious hospitals to make money).

Survey results showed that 800 (64.1%) respondents visited hospital-based clinics and 688 (55.1%) visited CHS at least once in the past year. Compared to the uninsured group, those covered by Urban Resident Medical Insurance (adjusted odds ratio or AOR=1.95, 95%CI 1.24-3.07) and Urban Employee Medical Insurance (AOR=2.59, 95%CI 1.59-4.24) were more likely to use hospital-based services. Respondents who had a chronic condition were more likely than their counterparts to use both hospital-based services (AOR=1.72, 95%CI 1.18-2.49) and CHS (AOR=1.66, 95%CI 1.19-2.32). Income levels were positively associated with the likelihood of

visiting hospital-based clinics (AOR=1.67, 95%CI 1.15-2.42) but negatively associated with the likelihood of using CHS (AOR=0.68, 95%CI 0.48-0.96).

Conclusions: Demand of hospital-based outpatient services is much higher than the community-based outpatient services. Policy reformers need to take further actions to address the public distrust in PCPs to facilitate their gatekeeping role.

Strengths and limitations of this study

- Our qualitative part provided the in-depth views of service users towards the community health services.

- The quantitative data triangulated the qualitative findings using a follow up cross-sectional survey approach.

- The study mapped out the public's utilization of both community- and hospital-based outpatient services in a free market style healthcare system in the urban setting.

- The study was conducted in a pioneer city implementing the national healthcare reforms and provided references to other areas of China with similar situations.

- The quantitative part of the study was a self-administered questionnaire survey which might introduce recall bias regarding past experiences.

Introduction

China has a three-tier healthcare system in which secondary and tertiary hospitals are supposed to provide specialized care while community health facilities provide primary care and preventive services. However, patients embrace the freedom to choose any level of care facility and direct access to specialist care without referrals by primary care doctors. The country has been engaged in a massive healthcare reform since 2009. Strengthening primary care system and diverting patients with common diseases from hospital-based care to community-based care is one of the top five priorities of the reform. [1] Nevertheless, the reform would not be successful if the voices of the service users are ignored. Previous research focused on patients' satisfaction in health services, including primary care. [2-5] Other studies attempted to explore *patients'* willingness to choose community health services (CHS) for first-contact care, of which percentages ranged between 62% and 70%, [6-8] but our recent study found 70% of the respondents sampled from the general *public* preferred hospital-based services for first-contact care. [9] Associated factors included patient's age, sex, education level, insurance status, awareness of CHS, and self-perceived severity of diseases. [7,8,10,11] Better accessibility and affordability were considered as strengths of CHS. [12] A few studies reported patients' concerns about the competence of primary care providers (PCPs) and quality of diagnostic equipment. [9,13-15] The general public's in-depth views towards CHS are lacking.

This study is part of a larger project examining how to better promote primary care in China using a combined qualitative and quantitative approach. The first aim of this article was to examine the general public's views towards the roles of CHS through the qualitative study. In China, PCPs refer to any type of medical practitioners, regardless of educational attainment, providing primary care in the community. PCPs include general practitioners (GPs who have

three-year or five-year medical education and are specialized in general practice through general practice training programs), barefoot doctors (3 to 6 months of basic medical training), and other medical practitioners providing primary care in the community setting. Because the service users are free to choose between facilities, it is possible that they seek medical help from multiple resources. The second aim was to investigate through a questionnaire survey their utilization of community- and hospital-based outpatient services in the year prior to the study, with a focus on the former. Since China's previous primary care system established between 1960s and 1980s has been a successful model for lower- and middle-income countries,[16] the Chinese experiences are relevant to other countries.

Methods

The study method was described elsewhere.[9] Data were collected from the general public living in the eight districts of central Hangzhou, with a population of 6.95 million, in Zhejiang province.

Qualitative approach

Sampling and data collection

We adopted both individual and focus group interviews to triangulate data. We purposefully sampled participants with diverse backgrounds for interviews. For individual interviews, we recruited participants from different age groups, with different education levels, income levels, and whether diagnosed as having chronic conditions or not. Group interviews were mainly arranged based on age groups with flexibility allowed. We identified a local researcher who had strong connections with local health authorities. We approached participants with the assistance of community workers.

Topic guides were developed for semi-structured interviews. This article focused on the participants' views of the roles of CHS and PCPs. Interviews were conducted between September 2014 and April 2015. Most interviews lasted around 60 minutes and were conducted in a quiet room in the community. Written consent was sought before the interview. Anonymity and confidentiality were stressed.

Data analysis

Interviews were audio-recorded and transcribed verbatim. One of the authors checked the accuracy of the transcripts. Data were analyzed using a thematic approach with the assistance of NVivo 10. Interview transcripts were double coded by two researchers to check for consistency and accuracy. Discrepancies were then discussed until consensus was reached. Afterwards, we organized and categorized codes into different themes/subthemes and further relevant questions were explored in subsequent interviews. We continued data collection until thematic saturation was reached. To ensure data validity, some key findings were triangulated by a follow-up survey. Quotes were translated from Chinese to English for write up.

Quantitative approach

Sampling and data collection

A cross-sectional survey was conducted from July to September 2015. Multi-stage stratified random sampling was adopted. First, we stratified the eight districts to low, middle and high-income regions. One district from each stratum was then randomly selected. Second, two street districts were randomly selected from each district. Then, 4 communities/villages were randomly selected from each sampled street district, making it a total of 24 survey sites. Lastly, individuals were randomly selected and approached with the assistance of the community workers, and we

recruited 45 to 50 respondents from each site. Anonymity was stressed and confidentiality was strictly protected.

Questionnaire

The complete questionnaire has 64 items. We asked the participants about their social demographic characteristics, insurance scheme (New Cooperative Medical Insurance or NCMI, Urban Resident Medical Insurance or URMI, Urban Employee Medical Insurance or UEMI, and commercial insurance), factors they consider for finding sources of care, preferred source of care, use of outpatient services in the last year, expectations on medical professionals in the clinical setting, and views of CHS and PCPs. . NCMI covered rural population, URMI covered people who were under 18 years old, the unemployed or poor, the disabled, and the elderly population, while UEMI covered employees. In this article, we reported the public's utilization of CHS and hospital-based clinics in the last year and the correlates. Experiences and views of community-based services were asked using four-point Likert scales (1 = completely disagree; 2 = somewhat disagree; 3= somewhat agree; 4 = completely agree). The questionnaire was piloted with 30 respondents to test its face- and content validity. The questionnaire aimed at investigating the attitudes and behaviors of the respondents, but did not serve as a composite measure of a certain domain. Hence it has not been validated against outcomes formally other than the face and content validity. Completing the questionnaire took 10 to 15 minutes. Amendments were made based on feedback.

Statistical analysis

The data were analyzed using IBM SPSS V.23. We had dichotomized the responses by grouping "completely agree and somewhat agree" as positive and "completely disagree and somewhat disagree" as negative response. Number of visits to CHS and hospitals were also categorized as

"none" and "at least once" for further multiple logistic regression analysis. Descriptive analysis

was carried out and Pearson Chi-squared test was conducted to examine the differences in the

views of community-based services among different age groups. We ran simple logistic

regression and multiple logistic regression analyses to test the effects of personal characteristics

(i.e., sex, age, income, health insurance status and chronic conditions) on the use of health

services and public opinions of PCPs. A p-value < 0.05 is considered statistically significant.

Results

Qualitative results

Six focus group interviews were held. Each group comprised of 6 to 8 participants. Meanwhile,

13 semi-structured individual interviews were conducted. Among the participants, 44.4% were

males. The mean age of all participants was 52.6 (SD=17.0), with the age ranged from 24 to 87.

Views towards the roles of CHS and perceptions of PCPs were revealed.

Roles of community health services

Many participants perceived that CHS were like drug dispensers rather than a medical care

provider (Appendix 1, quotes 1 and 2). CHS were regarded as a source for dealing with minor

illnesses, such as common colds and skin abrasions (Appendix 1, quote 3). Nevertheless, the

public's perception of minor and urgent/serious conditions might be largely different from the

professionals' views and varied across different participants. For example, fevers and abdominal

discomfort were considered by some as conditions that need hospital specialist consultations to

confirm the causes (Appendix 1, quotes 4 and 5). When the interviewer asked "_what proportion_

of your health problems can be dealt with by primary care providers", the responses widely

range from 20% to 90%.

Elderly patients with chronic diseases can be well managed in CHS (Appendix 1, quote 6). Some

participants described it as a source for follow-up care for chronic diseases but not for

confirming the initial diagnosis and management plan even for diabetes and hypertension

(Appendix 1, quotes 7 and 8). A key role played by CHS was to provide general and public

health education to the general public, as explained by a participant (Appendix 1, quote 9). The

function of triaging or making referrals by CHS was also discussed by some participants. CHS

could inform patients to make better decisions about which specialty to see or where to see a

specialist (Appendix 1, quotes 10 and 11). Such a status quo was deemed by them as a step

forward compared to the past (Appendix 1, quote 11). However, the lack of trust in PCPs'

integrity might pose a challenge for this function. For the question "*what would you think about

a PCP making an appointment with hospital specialists for you, as a coordinator?*", an

interviewee responded that he would doubt if the PCP was a "tuo er"[a] (Appendix 1, quote 12).

Perceptions towards primary care providers

Many participants frankly expressed PCPs were like barefoot doctors with minimal formal

medical education (Appendix 2, quote 1). The local dialects used were "san jiao mao" (a cat with

three legs[b]) and "wan jin you" (Tiger Balm[c]), meaning that PCPs saw any diseases yet were not

good at any kind of them (Appendix 2, quotes 2 and 3). In the doctor-patient relationship,

patients sometimes appeared to play a dominant role and requested treatments (Appendix 2,

quotes 4 and 5). Using "san jiao mao" or "wan jin you" as a metaphor to describe PCPs

demonstrated a strong public distrust in the level of competence of PCPs (Appendix 2, quotes 6

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[a] "Tuo er" is a Beijing dialect which means a cunning agent who pretends to be a client and tries to deceive the real customers and lead them to buy their products. It exists in many industries. In health industry, it means an agent who tries to lead patients to some notorious hospitals to make money.

[b] A popular idiom in Yangtze River Delta. It means jack of all trades and master of none

[c] A Chinese relieving ointment which can be applied for many conditions such as skin itchiness, headache, rheumatic pains, and diarrhea etc., leading to mild relief but not curing the diseases.

and 7). One major cause was the participants' belief that PCPs were inadequately educated and trained (Appendix 2, quote 7).

Survey results

A total of 1248 respondents completed the questionnaire. The overall response rate was 83%. Nearly half (49.4%) of the respondents were female. There were 132 (10.6%) aged 60 or above. Five hundred and four (40.4%) obtained post-secondary or higher education and 393 (31.5%) reported a monthly household income of 10,000 Yuan or above. Nearly one-fourth (325, 26.0%) were covered by NCMI, 388 (31.1%) were covered by URMI, and 272 (21.8%) were covered by UEMI. Over one-fifth (265, 21.2%) had a chronic condition. Details of their demographic characteristics have been reported elsewhere.[9] The majority (800, 64.1%, 95%CI 61.4%-66.7%) visited hospital-based clinics in the past year. Less (688, 55.1%, 95%CI 52.4%-57.9%) visited community-based clinics, 507 (74.2%) of whom also visited hospital clinics in the past year. Detailed distribution of the number of visits to the two types of clinic are shown in Table 1.

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Table 1 Visits to community- and hospital-based services in the year prior to the survey. N=1248

Number of visits (times)	0(%)		1-3(%)		4-6(%)		7-10(%)		>10(%)		Missing	
Community health facilities	485	(38.9)	455	(36.5)	125	(10.0)	42	(3.4)	66	(5.3)	75	(6.0)
Hospital outpatient clinics	376	(30.1)	557	(44.6)	154	(12.3)	41	(3.3)	48	(3.8)	72	(5.8)

Table 2 shows the associations between individual characteristics and the outpatient services

utilization based on the simple and multiple logistic regression analyses. Compared to the

uninsured group, those covered by URMI (adjusted odds ratio or AOR=1.95, 95%CI: 1.24-3.07)

and UEMI (AOR=2.59, 95%CI: 1.59-4.24) were significantly more likely to use hospital-based

services. Those who reported the highest household income (AOR=1.67, 95%CI: 1.15-2.42) and

a diagnosis of chronic illnesses (AOR=1.72, 95%CI: 1.18-2.49) were more likely to use hospital-

based services. In relation to community-based services, reporting a diagnosis of chronic

illnesses was significantly associated with the utilization (AOR=1.66, 95%CI: 1.19-2.32)

whereas the likelihood significantly decreased with income levels (AOR=0.68, 95%CI: 0.48-

0.96).

Table 2 Correlates of use of hospital- and community-based outpatient services

	Odds Ratio and Adjusted Odds Ratio of visiting a hospital specialist last year at least once		Odds Ratio and Adjusted Odds Ratio of visiting a community-based clinic last year at least once	
	OR(95% CI)	AOR(95% CI)	OR(95% CI)	AOR(95% CI)
Sex				
Male	1	1	1	1
Female	1.19(0.93,1.53)	1.16(0.88,1.52)	1.29(1.02,1.63) *	1.26(0.98,1.62)
Age				
18-39	1	1	1	1
40-59	1.20(0.89,1.62)	1.11(0.79,1.55)	1.09(0.82,1.44)	0.94(0.69,1.28)
60 or above	1.16(0.77,1.74)	0.70(0.43,1.14)	1.48(0.99,2.20)	1.16(0.73,1.84)
Insurance status				
Uninsured	1	1	1	1
NCMI[a]	0.99(0.65,1.49)	1.08(0.69,1.68)	1.19(0.79,1.80)	1.27(0.81,1.97)
URMI[b]	1.99(1.31,3.01)**	1.95(1.24,3.07)**	1.26(0.84,1.88)	1.30(0.84,2.02)
UEMI[c]	2.45(1.56,3.85)***	2.59(1.59,4.24) ***	1.14(0.75,1.74)	1.22(0.77,1.92)
Commercial insurance	1.07(0.55,2.08)	1.03(0.51,2.08)	0.89(0.46,1.71)	0.97(0.49,1.94)
Income				
< 4000	1	1	1	1
4000-9999	1.19(0.88,1.62)	1.09(0.78,1.52)	0.78(0.58,1.06)	0.76(0.55,1.05)
>10000	1.85(1.33,2.58)***	1.67(1.15,2.42) **	0.63(0.46,0.86)**	0.68(0.48,0.96) *
Chronic illness diagnosis				
No	1	1	1	1
Yes	1.70(1.23,2.34)**	1.72(1.18,2.49) **	1.68(1.25,2.25)**	1.66(1.19,2.32) **

[a]NCMI: new cooperative medical insurance; [b]URMI: urban resident medical insurance; [c]UEMI: urban employee medical insurance

Model fit descriptions for multiple logistic regression analysis: p values of Hosmer and Lemeshow test respectively for the two dependent variables are 0.456 and 0.454, indicating that the models fit the data well.

* p<0.05, ** p<0.01, *** p<0.001

Among the 688 CHS users, 464 (67.4%) offered comments about their experiences of using CHS (Table 3). Over half of them (53.4%) reported that they had a regular PCP, with significantly more respondents aged 60 or above reporting this than the other two age groups (p=0.020). Main reasons for visiting a community-based practitioner were refilling medications (54.7%) and seeking professional advice (64.0%). More from the elderly (84.7%) and middle aged (64.2%) groups than the youngest group (45.0%) went to CHS to buy or refill medications (p<0.001).

Almost 84% said that PCPs were polite to them. Up to 86.2% reported that PCPs listened to patients carefully. Nearly 80% reported that PCPs explained the disease, management plan and drug adverse effects patiently. Two thirds said that PCPs cared about their mental health (66%), were empathetic (69.2%), tried to keep a good relationship with the patient (68.1%) and put patients' interests at the first place (67.9%).

There were differences in their views by number of visits to CHS (Table 4). The percentages of reporting seeing a regular PCP (p=0.037), PCPs caring about their mental health status (p=0.004), keeping a good relationship (p=0.015), and putting patients' interests at first place (p=0.006) increased with the number of visits to CHS. Further, the percentage of reporting a purpose for refilling medications at CHS is higher among the frequent visitors of CHS, compared to those who visited less frequently (p=0.002). After controlling for sex, insurance status and income, multiple logistic regression analysis revealed that, compared to the age group 18-39, those aged over 60 were significantly more likely to have reported the purpose of refilling medication at CHS (AOR=5.59, 95%CI 2.62-11.92), and that PCPs cared about their mental health (AOR=2.04, 95%CI 1.00-4.13). Visiting over 10 times in the last year had a significant positive correlation with reporting PCPs caring about their mental health (AOR=3.42, 95%CI 1.33-8.81), keeping a

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good relationship (AOR=3.08, 95%CI 1.23-7.69) and putting patients' interests as the priority

(AOR=2.97, 95%CI 1.19-7.39), compared to those who paid 1-3 visits. However, only 43 (9.3%,

95%CI 7.0%-12.3%) reported that over 75% of their medical problems were managed by PCPs

and 60.2% reported that 50% or less of their medical problems were managed by PCPs when

they felt ill and sought help from a doctor.

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Table 3 Community health service users' experiences and their views of primary care providers by age. N=464

		Total(%)		Age						p-value χ2 test
				18-39(%)		40-59(%)		60 or above(%)		
I have a regular doctor.	Agree	246[b]	(54.3)	135	(50.2)	61	(55.0)	50	(68.5)	0.020
	Disagree	207	(45.7)	134	(49.8)	50	(45.0)	23	(31.5)	
One main reason I go to a PCP[a] is to seek their professional advice.	Agree	294	(65.0)	187	(69.0)	66	(60.0)	41	(57.7)	0.092
	Disagree	158	(35.0)	84	(31.0)	44	(40.0)	30	(42.3)	
One main reason I go to a PCP is to buy or refill some medications.	Agree	253	(56.0)	122	(45.0)	70	(64.2)	61	(84.7)	0.000
	Disagree	199	(44.0)	149	(55.0)	39	(35.8)	11	(15.3)	
PCPs are polite to me	Agree	385	(84.6)	218	(80.7)	100	(89.3)	67	(91.8)	0.020
	Disagree	70	(15.4)	52	(19.3)	12	(10.7)	6	(8.2)	
PCPs listen to me carefully when I talk about my Illness	Agree	397	(87.3)	233	(86.3)	101	(90.2)	63	(86.3)	0.565
	Disagree	58	(12.7)	37	(13.7)	11	(9.8)	10	(13.7)	
PCPs explain to me patiently (e.g. my disease, management plan, drug adverse effects etc.)	Agree	367	(80.8)	211	(78.4)	94	(83.9)	62	(84.9)	0.289
	Disagree	87	(19.2)	58	(21.6)	18	(16.1)	11	(15.1)	
PCPs care about my mental health (e.g. my worries and mood etc.)	Agree	301	(66)	168	(62.0)	75	(67.0)	58	(79.5)	0.020
	Disagree	155	(34.0)	103	(38.0)	37	(33.0)	15	(20.5)	
PCPs are empathetic.	Agree	319	(70.3)	183	(67.5)	79	(70.5)	57	(80.3)	0.112
	Disagree	135	(29.7)	88	(32.5)	33	(29.5)	14	(19.7)	
PCPs keep a good relationship with me.	Agree	314	(69.3)	181	(66.8)	77	(70.0)	56	(77.8)	0.196
	Disagree	139	(30.7)	90	(33.2)	33	(30.0)	16	(22.2)	
PCPs put patients' interests at first place.	Agree	312	(68.9)	178	(65.7)	79	(71.2)	55	(77.5)	0.135
	Disagree	141	(31.1)	93	(34.3)	32	(28.8)	16	(22.5)	

[a] PCP: primary care provider; [b] The numbers do not add up because of missing ages in some of the responses

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There were differences in their views by number of visits to CHS (Table 4). The percentages of

reporting PCPs caring about their mental health status (p=0.008), and putting patients' interests at

first place (p=0.038) increased with the number of visits to CHS. Further, more participants who

visited CHS more often reported a purpose for refilling medications, compared to those who

visited less frequently (p=0.012). After controlling for sex, insurance status and income, multiple

logistic regression analysis revealed that, compared to the age group 18-39, those aged over 60

were significantly more likely to have reported the purpose of refilling medication at CHS

(AOR=5.59, 95%CI 2.62-11.92), and that PCPs cared about their mental health (AOR=2.04,

95%CI 1.00-4.13). Visiting over 10 times in the last year had a significant positive correlation

with reporting PCPs caring about their mental health (AOR=3.42, 95%CI 1.33-8.81), keeping a

good relationship (AOR=3.08, 95%CI 1.23-7.69) and putting patients' interests as the priority

(AOR=2.97, 95%CI 1.19-7.39), compared to those who paid 1-3 visits. However, only 43 (9.3%,

95%CI 7.0%-12.3%) reported that over 75% of their medical problems were managed by PCPs

and 60.2% reported that 50% or less of their medical problems were managed by PCPs when

they felt ill and sought help from a doctor.

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Table 4 Community health service users' experiences and their views of primary care providers by number of visits to CHS. N=464

		Total(%)		Number of visits to CHS[b] (times)								p-value
				1-3(%)		4-6(%)		7-10(%)		Over 10(%)		
I have a regular doctor	Agree	244[c]	(54.8)	134	(50.2)	41	(56.9)	17	(60.7)	32	(69.6)	0.106
	Disagree	201	(45.2)	133	(49.8)	31	(43.1)	11	(39.3)	14	(30.4)	
One main reason I go to a PCP[a] is to seek their professional advice	Agree	292	(65.8)	174	(65.7)	52	(73.2)	19	(67.9)	26	(54.2)	0.321
	Disagree	152	(34.2)	91	(34.3)	19	(26.8)	9	(32.1)	22	(45.8)	
One main reason I go to a PCP is to buy or refill some medications	Agree	248	(55.9)	135	(50.9)	44	(62.0)	16	(57.1)	37	(77.1)	0.012
	Disagree	196	(44.1)	130	(49.1)	27	(38.0)	12	(42.9)	11	(22.9)	
PCPs are polite to me	Agree	379	(84.8)	221	(82.5)	62	(84.9)	25	(89.3)	45	(95.7)	0.202
	Disagree	68	(15.2)	47	(17.5)	11	(15.1)	3	(10.7)	2	(4.3)	
PCPs listen to me carefully when I talk about my illness	Agree	389	(87.0)	229	(85.8)	67	(91.8)	23	(82.1)	44	(91.7)	0.460
	Disagree	58	(13.0)	38	(14.2)	6	(8.2)	5	(17.9)	4	(8.3)	
PCPs explain to me patiently (e.g. my disease, management plan, drug adverse effects etc.)	Agree	360	(80.7)	209	(78.0)	61	(83.6)	21	(77.8)	41	(87.2)	0.294
	Disagree	86	(19.3)	59	(22.0)	12	(16.4)	6	(22.2)	6	(12.8)	
PCPs care about my mental health	Agree	292	(65.2)	164	(61.2)	45	(61.6)	18	(64.3)	42	(87.5)	0.008
	Disagree	156	(34.8)	104	(38.8)	28	(38.4)	10	(35.7)	6	(12.5)	
PCPs are empathetic	Agree	314	(70.4)	187	(69.8)	48	(66.7)	20	(71.4)	39	(83.0)	0.327

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(e.g. my worries and mood etc.)	Disagree	132	(29.6)	81	(30.2)	24	(33.3)	8	(28.6)	8	(17.0)	
PCPs keep a good relationship with	Agree	309	(69.3)	174	(65.2)	52	(71.2)	20	(71.4)	40	(85.1)	0.085
me	Disagree	137	(30.7)	93	(34.8)	21	(28.8)	8	(28.6)	7	(14.9)	
PCPs put patients' interests at first	Agree	310	(69.5)	175	(65.5)	54	(74.0)	22	(78.6)	40	(85.1)	0.038
place	Disagree	136	(30.5)	92	(34.5)	19	(26.0)	6	(21.4)	7	(14.9)	

[a] PCP: primary care provider;   [b] CHS: community health services

[c] The numbers do not add up because of missing values in some of the responses.

Discussion

Demand of hospital-based outpatient services is much higher than the community-based outpatient services indicating a wastage of health resources. In a healthcare system which allows a large degree of freedom to choose any health institution for healthcare, patients choose hospitals which they think can provide better care. A minority thought that PCPs managed over 75% of their medical problems, indicating a widespread lack of confidence in PCPs' competence. Many participants perceived PCPs as inferior in managing diseases of specific organ systems than specialists. Their perceptions might also be affected by historical factors. PCPs were deemed not different from barefoot doctors who, although with inadequate training, met basic healthcare needs of the rural population from 1960s to 1980s but less so at the present time. The bad experiences, such as not getting satisfactory explanations from a PCP, reinforced such perceptions.

Inadequate formal medical education and training for PCPs is an underlying problem. In 2013, around 76% of PCPs in urban community health facilities obtained 3 or more years of formal medical education and this compared to 90% of hospital specialists. [17] Doctors' showing clinical competence is critical to gaining patients' trust which lays a foundation for a healthy doctor-patient relationship.[18] Improving PCPs' competence through bettering the primary care education system is a top priority for building a strong primary care system and the subsequent success of health reforms in China.

Besides, those with higher household income and urban residents covered by URMI and UEMI were more likely to use hospital-based services. People may be inclined to put their preference into practice when the financial constraints are reduced or removed. The NCMI appears to have no impact on their utilization of hospital-based clinic. This might be due to the lower

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reimbursement rate for self-referred patients at hospitals and poorer out-of-pocket payment capacity by rural-to-urban migrants. Better-off patients with chronic diseases need long-term care which generally increases the chances for visiting doctors in both hospitals for specialist care and CHS for follow-up care or refilling medications.

One perceived function of CHS in the public's eyes is minor illness management. However, the public's understanding may be greatly different from the professionals' views. Common conditions, such as fevers and abdominal discomfort, most of which are minor, are considered by some patients as conditions that need hospital specialists' consultations or diagnostic tests to confirm the causes and management plans. CHS is also considered a referral agency which could advise patients of a preferred hospital specialist. This is a positive trend because, if the public are willing to accept CHS as a referral body, to some extent, CHS can function as a gatekeeper and coordinator. Helping patients make better informed decisions of seeing appropriate specialists has the potential to reduce unnecessary care considerably.

Other roles of CHS, which are well accepted by the public, include drug dispensing, managing patients with chronic diseases and patient education. Although the service users lack confidence in CHS as a provider of first-contact care,[9] providing aforementioned quality services to patients in need can gradually build up a rapport with the patients, and regain trust. As our survey identifies, more contact with PCPs may contribute to positive public opinions towards PCPs regardless of the reasons for encounters. Strengthening these functions are likely to be a good starting point for CHS to attract and keep patients in primary care. Nevertheless, frequent report for refilling medications may not be clinically indicated and whether there are unnecessary visits due to refilling medications are worth further examination. Also, "Tuo er" mentioned by one

participant indicates that a deep distrust in PCPs' integrity in acting as a coordinator may exist, which may be worth further actions.

This study has some strengths and limitations. The data were collected in a developed urban city where hospitals are easily accessible to the general public. The study findings only relate to Zhejiang province and may not be generalizable to less developed, rural areas. However, as one of the earliest health reform pilot cities, Hangzhou has developed a highly accessible and affordable primary care system. The findings provide a snapshot of the public's healthcare utilization patterns in the context of an intensive healthcare reform. Then a self-administered questionnaire might introduce recall bias regarding past experiences. We designed the experience questions using ranges to make it easier to respond. The items on their views and attitudes are subjective in nature and concerns about recall bias are inconsequential. Further, our qualitative study enables us to acquire an in-depth understanding of their thoughts.

Conclusion

The study aimed to investigate the public's views towards CHS and their healthcare utilization experiences. Both community- and hospital-based outpatient services are heavily consumed with the latter being used by more respondents. The public's perceptions of PCPs reflect a deep distrust in their competence. The distrust places a huge obstacle to CHS assuming the role of first-contact care provider. Nevertheless, other functions like making referrals, providing follow-up care and health education are well accepted and can be a good starting point for CHS to earn public trust. The gatekeeping role shall be gradually adopted by CHS after a strong primary care workforce is established by a primary care oriented education system.

Conflict of interests

The authors declared no conflict of interests.

Ethics approval

Ethical approvals were obtained from the Review Boards of The University of Hong Kong/Hospital Authority Hong Kong West Cluster (UW14-567) and Zhejiang University (ZGL201410H) respectively.

Contributors

This research formed part of DW's PhD project. DW, TPL, and XDZ designed the study and the questionnaire. DW and XDZ coordinated fieldwork and collected data. DW, SKS and KFL performed the data analysis. DW, SKS and TPL interpreted the analysis. DW, SKS and TPL drafted the manuscript. All authors reviewed, revised, and approved the final manuscript.

Data sharing statement

Our study also collected data from medical professionals. These data are not published and are available to the corresponding author and the research team only.

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Appendix 1 The public's views towards the roles of community health services

Perceived roles of community health services	Quotes
Drug dispensers	1. It feels just like a drug store. It is exactly the same nature. Drug stores are similar [to community health facilities] and they are licensed too. (Group3, P4) 2. I would request the drugs I want and he [the primary care provider] then prescribes it. If I need to see a doctor for illness, I would go to a hospital. (Individual, P4)
Minor illness management	3. When I feel that I have a cough and running nose, I don't think I have to go to a big hospital. Then [I could go to] a community facility and the doctor can prescribe me some medications to treat my sore throat or my symptoms. If you are talking about severe conditions, they indeed cannot deal with them. (Group3, P5) 4. If you have fevers, you definitely need to go to a big hospital. (Group3, P3) 5. [I] usually come here [the community facility] for common colds or fevers. For major illnesses, I go to hospitals, such as hepatitis, cancer, or something in the abdomen. (Individual, P6)
Elderly care and chronic disease management	6. Community [health facilities] cannot deal with urgent cases after all. I think they can provide daily care to elderly patients and manage chronic diseases. (Individual, P11) 7. Community [health facilities] can refill my medications as I have needs to take medications for diabetes and hypertension for a long time and it is too troublesome to go to a hospital for refilling medications. (Group3, P5) 8. Even if we go [to the community facility], they cannot identify the diagnosis. If they were able to diagnose my diabetes, of course I would go. They can identify hypertension but they don't know what medications to use. It's like the [primary care] doctor is not able to prescribe [the right drug] and he could only prescribe according to what a hospital specialist has prescribed to me. He would say that "the hospital hasn't prescribed [the drug before], so I dare not prescribe this." (Individual, P1)
Patient education	9. Nowadays, people pay more attention to their health. They [community health facilities], I think, should do a lot of health education and improve the public's lifestyle, such as forming healthy living habits. Lifestyle like how much salt and oil one should consume. Some of these are very minor issues, but if you repeat more often, they can become

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	people's common sense, such as low-salt, low-fat diet, and exercise every day. The community facilities' role of health education is irreplaceable. (Individual, P11)
Referral body	10. Maybe average people would consult [doctors] in the community to figure out which specialty they need to see first. (Individual, P11) 11. [Community health facilities] can sometimes make an initial assessment for you, like what problem you might have and where you need to take a test. Then you know where to target and you don't have to look around when you go to [a hospital in] the city. It is more convenient and you know which specialty to see, internal medicine, surgery, neurology or whatever. It is much more convenient than before. (Group6, P1) 12. If he helps me make an appointment, I would be suspicious. I cannot help thinking if he is a "tuo er". There is a possibility that they may take kickbacks. The other doctor liaised by him may be his relative. I heard this from others because there are too many such reports. (Individual, P10)

Appendix 2 The public's perceptions of primary care providers

Perceptions of primary care providers (PCPs)	Quotes
Barefoot doctors	1. I think PCPs should know a wide range of diseases, including internal medicine, surgery or dermatology. This is how I understand it—knowing a bit about every specialty. PCPs are like barefoot doctors. They cannot deal with many problems and he will suggest you go to a hospital. (Group3, P2)
San jiao mao	2. Using our dialect, he [a PCP] is like "san jiao mao", i.e., a barefoot doctor. It means that he knows a little bit about everything. But, offensively, when you ask further medical questions, he doesn't know [about the illness] or about the medications. (Group3, P5)
Wan jin you	3. PCPs are "wan jin you". They are just like "jack of all trades and master of none". We locals think this way. (Individual, P11)
Patient-dominance in the PCP-patient relationship	4. When I go to see a PCP, it's up to me to decide what medications I need. (Group1, P1) 5. For example, if I have a common cold then I would say [to the doctor], "Tylenol" (a domestic type of paracetamol). That's it. He is not the doctor. I am the doctor. (Gp3, P3)
Public distrust	6. Honestly, if you really ask a PCP to explain the details about certain drugs or what side effects the drugs would have, in most cases, he cannot tell. If you ask him why he prescribe this medication to me, he would say "everyone prescribes this then I also prescribe this" or "our facility has this medicine only". He just gives such an explanation. (Group5, P1) 7. I had a surgery on my leg this year and I had my dressing changed [at the PCP's clinic]. Honestly, the PCP was like that he cannot even target my wound. I can even do it better than he does. These are called PCPs. I would put a question mark. These people may not be well trained and educated. (Group4, P3)

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