

Association between Medical Resource Allocation and Satisfaction with Services of Public Health Management: Evidence from China

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Abstract

Background: People's satisfaction has been one important indicator to measure the health care quality in health systems. Medical resource allocation issues have also become an important concern affecting the equity and satisfaction of health service. This study aimed to study the factors affecting people's satisfaction with the services of public health management in China. Specifically, we examine the association between medical resource allocation and satisfaction with the services of public health management.

Methods: To explore the associations between medical resource allocation and satisfaction with services of public health management in China, we derived data from the 2013 wave of the Chinese General Social Survey (CGSS). Models were estimated using multivariable logistic regression analysis.

Results: Among factors of evaluation of medical resource allocation, adequacy of medical service resources, market-oriented and insufficiently public of public health services, and convenience of access to public health services were all significantly associated with satisfaction with services of public health management except the balance of medical service resources' distribution. Also, for different service projects and areas, the link between satisfaction with health service and residents' characteristics also depends on specific service content.

Conclusions: There is a link between medical resource allocation and satisfaction with the services of public health management. Medical resource allocation does affect satisfaction with services of public health management. It is necessary to improve the adequacy, publicity of medical services, and convenience of access to public health services in China.

Background

Patient satisfaction is a key phenomenon that reflects the patients' needs for optimizing healthcare systems and provides knowledge about patient needs about the perceived quality of Healthcare^[1]. In December 2015, health was put in the central position of the global Sustainable Development Goals (SDGs) by the United Nations^[2]. Health service satisfaction is a complex concept with multidimensional composite^[3]. But it has become a key indicator for measuring the care quality and safety in health systems^[4]. Patient satisfaction is the fulfillment of needs and desires from the real delivery of healthcare which is perceived by patients^[5]. It should be given more attention by healthcare managers that achieving a high or excellent rating of patient satisfaction to improve the service delivery quality because the market of healthcare industries is becoming increasingly competitive^[6].

Some studies have examined health service satisfaction from an individual perspective, such as the demographic and some economic factors^[7, 8], and found that the patient-related characteristics are determinants of patient satisfaction^[9]. For example, as one of the socio-demographic factors, income is found to influence patient satisfaction^[10]. Also, some studies have attempted to relate the patient's health status to factors such as the performance of the healthcare system^[11]. This means that sociodemographic factors are associated with satisfaction of health service.

However, the link between satisfaction with public health service and patients' characteristics (i.e. gender, age) remains uncertain; even the related research finds also seem contradictory. Some authors report that older

people, men, and the majority of ethnic groups are more likely to be satisfied^[12, 13]. But some other research findings seem to be inconsistent^[14, 15].

Especially, medial resource allocation issues have also become an important concern affecting health service satisfaction. It has been examined that the factors regarding medical resource allocation have a significant impact on health service satisfaction. They fail to access care services that may be connected with barriers in accessing services and lead to the service dissatisfaction^[16]. The availability of health services resources affects the satisfaction of the user. So some institutional factors may affect medical service satisfaction. Such as the allocation of medical resources and the availability of medical resources, etc. The availability of high-level doctors^[17], waiting time^[18], the distance from home, and availability of medicines also has an important impact on health service satisfaction^[19]. Based on research from European countries, Kroneman found that the availability of medical resources significantly affects health service satisfaction^[20].

In China, one of the five key objectives of China's new healthcare reform, launched in 2009, is to strengthen the basic-level health service delivery system. However, China still faces a series of problems, such as the rapid increase in medical costs, the unfair medical burden, the decline in medical access for low-income people, and the limited improvement in medical standards^[21]. Therefore, in China, it is important to strengthen the analysis and investigation of health satisfaction.

No country's people are particularly satisfied with their medical systems^[22]. Services of public health management are the important content of health services. In particular, the allocation of medical resources closely illustrates the equity and effectiveness of public health systems. However, contemporary research regarding health service satisfaction in China usually focused on the individual perspective, such as patients' sociodemographic characteristics; or just focus on overall health service satisfaction, with a lack of research on specific dimensions of health service. The association between medical resource allocation and satisfaction with the services of public health management remains unknown. To extend previous work, this article plans to examine the satisfaction with services of public health management from a national resident perspective, and explore the relationship between the allocation of medical resources and satisfaction with services of public health management, as well as resident sociodemographic characteristics.

Methods

Data

Data in this study were derived from the 2013 wave of the Chinese General Social Survey (CGSS). Generally, CGSS, which is conducted by the National Survey Research Center at the Renmin University of China, is a nationally representative continuous cross-sectional survey on more than 10,000 households in provinces, municipalities, and autonomous regions in mainland China. Information of the respondents, including socioeconomic status, demographic characteristics, health-related behaviors and lifestyles, health status (such as health insurance, health conditions, and health services use) were collected, through a face-to-face interview.

The CGSS data could be downloaded on the official website (<http://cgss.ruc.edu.cn/>).

Evaluation of Medical Resource Allocation. This article assumes that people's perception and evaluation of medical resource allocation affects the Satisfaction with Services of Public Health Management of the survey respondents. A 5-point Likert scale was used to measure people's perceived evaluation towards resource allocation, that is, adequacy of service resources provided by public health services, the balance of service resources' distribution across different regions, market-oriented and insufficiently public of public health services, and convenience of access to public health services.

Measures

Satisfaction with Services of Public Health Management. The dependent variable in this study was the Satisfaction with Services of Public Health Management of the survey respondents in CGSS. A total of 6 items measure the respondents' satisfaction with public health management which can be divided into two groups through factor analysis: Health Regulation (Hygiene supervision management (food, drinking water, public places, etc.), Essential drug regime and Drug Safety Management), and Health Management (Urban and rural residents' health file service, Chronic disease management, and Severe mental illness management). They were evaluated by the question "How satisfied are you with each of the following aspects of public health services". The responses were measured using a 5-point Likert scale ranging from strongly dissatisfied to strongly satisfied. As the dependent variables of our analysis, the answer for each item was dichotomized into two groups: High Satisfaction Levels, where the answer was either satisfied or very satisfied; and Low Satisfaction Levels, where the answer was very dissatisfied, dissatisfied or average.

Sociodemographic factors. Similar to prior studies, some of the sociodemographic factors were selected for the analysis based on prior literature on the satisfaction of public health services. These selected factors are sex, age, education level, hukou (household registration), perceived household income, access to medical insurance, and access to a pension.

Hukou is a variable unique to China. In China, a person should register in one and only one place of regular residence in the hukou system, which is an institutional arrangement to control the population mobility, such as migration. Hukou in China usually has two categories, rural hukou and urban hukou^[23]. According to the questionnaire setting, hukou is divided into rural residents and non-rural residents in this article.

Evaluation of Medical Resource Allocation. Evaluation of Medical Resource Allocation was measured by questions 'Do you think the current health care resources are adequate?', "Is the service resources' distribution across different regions balanced?", "Is it serious that public health services are market-oriented and insufficiently public?", "Is it convenient to get public health services?". The answers were measured using a 5-point Likert scale ranging from Level 1 to Level 5. Respectively, adequacy of medical service resources, ranging from most adequate to least adequate; the balance of medical service resources' distribution, ranging from most balanced to most uneven; market-oriented and insufficiently public of public health services, ranging from most serious to not serious at all; the convenience of access to public health services, ranging from most convenient to not convenient at all.

Statistical analysis

Descriptive statistical methods were used to illustrate the distribution of sociodemographic factors, Evaluation of Resource Allocation, and High Satisfaction with Services of Public Health Management based on different

specific dimensions.

The associations between Sociodemographic factors, Evaluation of Resource Allocation, and High Satisfaction with Services of Public Health Management based on different specific dimensions were accessed using multivariate analyses, and models were estimated using multivariable logistic regression analysis using R 3.6.3. Odds Ratio (OR) and its 95% confidence interval (95%CI) were calculated. All statistical tests were 2-sided, and P-values of < 0.05 were considered as statistically significant.

Results

Bivariate Associations between factors and high satisfaction with the services of public health management

In a preliminary bivariate analysis of the data, bivariate associations between sociodemographic characteristics, factors of evaluation of medical resource allocation, and high satisfaction levels in items of health regulation and health management can be seen in Table 1 and Table 2. For all the 6 items that measure the satisfaction with services of public health management, factors of evaluation of medical resource allocation (adequacy of service resources, the balance of service resources' distribution, market-oriented and insufficiently public of public health services, and convenience of access to public health services) were all significantly associated with high satisfaction levels.

Table 1
Bivariate Associations between Predictors and High Satisfaction Levels in Health Regulation

High Satisfaction Levels in Health Regulation			
	Hygiene supervision management (food, drinking water, etc.), 28.73%, (n = 5287)	Essential drug regime, 30.25%, (n = 5263)	Drug Safety Management, 29.18%, (n = 5294)
Sex	$P^{\dagger} = .390$	$P = .292$	$P = .988$
Male	29.26%(785)	30.91%(824)	29.17%(781)
Female	28.19%(734)	29.57%(768)	29.19%(764)
Age	$P = .015^*$	$P = .883$	$P = .692$
≤ 30	24.15%(205)	29.09%(247)	28.27%(240)
31–50	29.56%(608)	30.42%(623)	28.63%(591)
51–69	29.85%(525)	30.45%(532)	29.84%(524)
≥ 70	29.10%(181)	30.69%(190)	30.40%(190)
Education level	$P = .012^*$	$P = .718$	$P = .002^{**}$
Elementary school level or below	31.15%(570)	30.95%(564)	31.85%(586)
Junior/senior middle school or technical secondary school	27.87%(721)	29.94%(770)	28.47%(735)
Undergraduate or above	26.24%(228)	29.72%(258)	25.72%(224)
Hukou	$P = .395$	$P = .287$	$P < .001^{***}$
Rural resident	29.21%(852)	30.88%(897)	31.52%(921)
Non-rural resident	28.14%(665)	29.52%(694)	26.35%(623)
Perceived household income	$P = .216$	$P = .251$	$P = .717$
Below average	27.61%(486)	30.31%(531)	28.77%(507)
Average	28.89%(895)	29.79%(919)	29.21%(906)
Above average	31.86%(130)	33.83%(137)	30.81%(126)
Access to medical insurance[‡]	$P = .710$	$P = .021^*$	$P < .001^{***}$
No	28.10%(152)	25.98%(139)	22.08%(119)
Yes	28.86%(1361)	30.81%(1447)	30.06%(1420)
Access to pension[§]	$P = .008^{**}$	$P = .017^*$	$P = .006^{**}$

High Satisfaction Levels in Health Regulation			
No	26.46%(430)	28.05%(455)	26.63%(433)
Yes	30.04%(1068)	31.35%(1108)	30.36%(1081)
Adequacy of medical service resources	<i>P</i> < .001 ^{***}	<i>P</i> < .001 ^{***}	<i>P</i> < .001 ^{***}
Level 1 (most adequate)	54.40%(68)	61.90%(78)	61.42%(78)
Level 2(more adequate)	42.79%(801)	46.76%(873)	45.07%(846)
Level 3 (neutrality)	22.04%(424)	21.06%(402)	20.29%(389)
Level 4 (less adequate)	17.35%(203)	18.99%(222)	17.93%(211)
Level 5 (least adequate)	11.38%(19)	7.88%(13)	8.93%(15)
Balance of medical service resources' distribution	<i>P</i> < .001 ^{***}	<i>P</i> < .001 ^{***}	<i>P</i> < .001 ^{***}
Level 1 (most balanced)	56.86%(29)	70.59%(36)	58.82%(30)
Level 2(more balanced)	47.64%(494)	51.21%(531)	51.44%(535)
Level 3 (neutrality)	25.75%(427)	25.97%(428)	24.53%(406)
Level 4 (more uneven)	23.57%(492)	24.71%(514)	22.76%(476)
Level 5 (most uneven)	15.54%(53)	17.25%(59)	16.28%(56)
Market-oriented and insufficiently public of public health services	<i>P</i> < .001 ^{***}	<i>P</i> < .001 ^{***}	<i>P</i> < .001 ^{***}
Level 1 (most serious)	18.07%(86)	15.43%(73)	16.28%(77)
Level 2(more serious)	23.69%(451)	26.30%(499)	24.41%(466)
Level 3 (neutrality)	28.55%(585)	29.50%(603)	29.13%(596)
Level 4 (not too serious)	49.15%(345)	52.57%(368)	49.15%(346)
Level 5 (not serious at all)	61.90%(26)	62.79%(27)	55.81%(24)
Convenience of access to public health services	<i>P</i> < .001 ^{***}	<i>P</i> < .001 ^{***}	<i>P</i> < .001 ^{***}
Level 1 (most convenient)	54.58%(149)	58.24%(159)	54.71%(151)
Level 2(more convenient)	35.54%(837)	38.43%(897)	37.35%(877)
Level 3 (neutrality)	21.79%(333)	21.61%(330)	20.57%(316)
Level 4 (not too convenient)	17.58%(176)	18.60%(186)	17.33%(174)
Level 5 (not convenient at all)	18.70%(23)	14.75%(18)	20.16%(25)
† <i>P</i> for Chi-square test. * <i>P</i> < 0.05, ** <i>P</i> < 0.01, *** <i>P</i> < 0.001			

High Satisfaction Levels in Health Regulation

‡ include urban medical insurance, new cooperative medical insurance, and public medical insurance.

§ include rural pension, urban residents' pension.

Table 2
Bivariate Associations between Predictors and High Satisfaction Levels in Health Management

High Satisfaction Levels in Health Management			
	Urban and rural residents' health file service, 35.13%, (n = 5244)	Chronic disease management, 27.47%, (n = 5271)	Severe mental illness management, 23.36%, (n = 5240)
Sex	$P^{\dagger} = .374$	$P = .876$	$P = .168$
Male	35.70%(949)	27.57%(736)	24.15%(642)
Female	34.53%(893)	27.37%(712)	22.54%(582)
Age	$P = .001^{**}$	$P < .001^{***}$	$P = .360$
≤ 30	29.57%(249)	20.38%(173)	21.75%(184)
31–50	35.18%(719)	27.56%(565)	22.84%(466)
51–69	36.72%(639)	29.22%(512)	24.67%(429)
≥ 70	38.03%(235)	31.94%(198)	23.58%(145)
Education level	$P = .036^{*}$	$P = .033^{*}$	$P = .274$
Elementary school level or below	33.54%(609)	29.49%(540)	23.76%(431)
Junior/senior middle school or technical secondary school	36.86%(947)	26.87%(691)	22.51%(576)
Undergraduate or above	33.33%(286)	25.03%(217)	25.06%(217)
Hukou	$P = .024^{*}$	$P = .748$	$P = .136$
Rural resident	33.81%(975)	27.65%(804)	22.56%(651)
Non-rural resident	36.80%(866)	27.25%(642)	24.32%(571)
Perceived household income	$P < .001^{***}$	$P = .026^{*}$	$P < .001^{***}$
Below average	32.36%(565)	25.60%(450)	21.03%(367)
Average	35.57%(1093)	27.92%(862)	23.71%(728)
Above average	43.81%(177)	31.85%(129)	30.20%(122)
Access to medical insurance[‡]	$P < .001^{***}$	$P = .005^{**}$	$P = .028^{*}$
No	26.17%(140)	22.30%(120)	19.55%(105)
Yes	36.15%(1692)	28.05%(1319)	23.80%(1112)

High Satisfaction Levels in Health Management			
Access to pension[§]	<i>P</i> < .001 ^{***}	<i>P</i> < .001 ^{***}	<i>P</i> < .001 ^{***}
No	28.54%(461)	21.74%(353)	19.32%(312)
Yes	38.45%(1355)	30.18%(1068)	25.36%(892)
Adequacy of medical service resources	<i>P</i> < .001 ^{***}	<i>P</i> < .001 ^{***}	<i>P</i> < .001 ^{***}
Level 1 (most adequate)	62.70%(79)	52.38%(66)	48.41%(61)
Level 2(more adequate)	51.46%(953)	41.72%(779)	35.20%(655)
Level 3 (neutrality)	26.94%(514)	20.36%(389)	17.46%(332)
Level 4 (less adequate)	21.91%(255)	16.35%(191)	13.97%(162)
Level 5 (least adequate)	18.67%(31)	11.24%(19)	7.27%(12)
Balance of medical service resources' distribution	<i>P</i> < .001 ^{***}	<i>P</i> < .001 ^{***}	<i>P</i> < .001 ^{***}
Level 1 (most balanced)	59.62%(31)	58.82%(30)	54.90%(28)
Level 2(more balanced)	56.64%(584)	46.20%(480)	41.96%(433)
Level 3 (neutrality)	30.58%(503)	24.94%(411)	20.44%(336)
Level 4 (more uneven)	28.92%(600)	20.91%(435)	17.84%(369)
Level 5 (most uneven)	26.63%(90)	19.24%(66)	13.24%(45)
Market-oriented and insufficiently public of public health services	<i>P</i> < .001 ^{***}	<i>P</i> < .001 ^{***}	<i>P</i> < .001 ^{***}
Level 1 (most serious)	25.74%(121)	20.30%(96)	17.91%(84)
Level 2(more serious)	30.55%(578)	23.75%(452)	21.04%(398)
Level 3 (neutrality)	33.89%(689)	27.24%(556)	21.71%(442)
Level 4 (not too serious)	56.74%(400)	43.41%(303)	38.34%(268)
Level 5 (not serious at all)	57.14%(24)	47.62%(20)	50.00%(21)
Convenience of access to public health services	<i>P</i> < .001 ^{***}	<i>P</i> < .001 ^{***}	<i>P</i> < .001 ^{***}
Level 1 (most convenient)	62.87%(171)	57.30%(157)	47.62%(130)
Level 2(more convenient)	43.80%(1018)	32.98%(771)	27.72%(645)
Level 3 (neutrality)	25.90%(395)	21.31%(326)	18.48%(280)
Level 4 (not too convenient)	23.54%(234)	16.83%(168)	14.99%(149)
Level 5 (not convenient at all)	19.01%(23)	20.16%(25)	15.32%(19)

High Satisfaction Levels in Health Management

† *P* for Chi-square test. **P* < 0.05, ***P* < 0.01, ****P* < 0.001

‡ include urban medical insurance, new cooperative medical insurance, and public medical insurance.

§ include rural pension, urban residents' pension.

For satisfaction in health regulation items (Table 1), nearly 30.25% reported high satisfaction levels with essential drug regime, and sociodemographic characteristics (i.e. access to medical insurance and pension) were also significantly associated with high satisfaction levels. Nearly 29.18% reported high satisfaction levels with drug safety management service, which is also associated with education level, hukou, access to medical insurance, and pension. Approximately 28.73% reported high satisfaction levels with hygiene supervision management service (food, drinking water, etc.), which is also associated with sociodemographic factors including age, education level, and access to a pension.

For satisfaction in health management items (Table 2), nearly 35.13% reported high satisfaction levels with urban and rural residents' health file service, and sociodemographic characteristics, such as age, education level, hukou, perceived household income, access to medical insurance and pension were also significantly associated with high satisfaction levels. About 27.47% reported high satisfaction levels with chronic disease management service, which is also associated with age, education level, perceived household income, access to medical insurance, and pension. The least, 23.36% reported high satisfaction levels with severe mental illness management service, which is also associated with sociodemographic factors like perceived household income, access to medical insurance, and pension.

Multivariable logistic regression models of factors and high satisfaction with services of public health management

Table 3 and Table 4 displays multivariable logistic regression models of sociodemographic characteristics and factors of evaluation of medical resource allocation associated with high satisfaction with the services of public health management.

Table 3

Multivariable Logistic Regression Models of Predictors for High Satisfaction Levels in Health Regulation

High Satisfaction Levels in Health Regulation						
	Hygiene supervision management (food, drinking water, public places, etc.)		Essential drug regime		Drug Safety Management	
	OR	<i>p</i> ^t	OR	<i>p</i> ^l	OR	<i>p</i> ^l
Sex						
Male	Reference		Reference		Reference	
Female	0.909(0.797–1.036)	.152	0.904(0.792–1.031)	.133	0.969(0.848–1.107)	.646
Age						
≤ 30	Reference		Reference		Reference	
31–50	0.908(0.678–1.216)	.518	0.846(0.634–1.127)	.253	0.823(0.616–1.100)	.188
51–69	1.136(0.902–1.431)	.278	0.928(0.740–1.164)	.519	0.866(0.688–1.090)	.219
≥ 70	0.908(0.678–1.216)	.518	0.846(0.634–1.127)	.253	0.823(0.616–1.100)	.188
Education level						
Elementary school level or below	Reference		Reference		Reference	
Junior/senior middle school or technical secondary school	0.870(0.739–1.023)	.093	1.033(0.876–1.219)	.700	0.972(0.823–1.147)	.735
Undergraduate or above	0.838(0.653–1.076)	.166	1.147(0.893–1.471)	.283	0.979(0.759–1.263)	.870
Hukou						
Rural resident	Reference		Reference		Reference	
Non-rural resident	1.022(0.878–1.191)	.775	0.971(0.833–1.133)	.711	0.820(0.702–0.958)	.013*
Perceived household income						
Below average	Reference		Reference		Reference	

High Satisfaction Levels in Health Regulation						
Average	1.042(0.902– 1.205)	.575	0.853(0.738– 0.986)	.031*	0.920(0.795– 1.065)	.265
Above average	1.149(0.886– 1.489)	.296	0.955(0.735– 1.241)	.731	0.946(0.724– 1.235)	.681
Access to medical insurance[‡]						
No	Reference		Reference		Reference	
Yes	0.899(0.715– 1.130)	.362	1.219(0.962– 1.545)	.102	1.453(1.135– 1.860)	.003**
Access to pension[§]						
No	Reference		Reference		Reference	
Yes	1.120(0.957– 1.309)	.157	1.060(0.907– 1.240)	.462	1.111(0.949– 1.301)	.190
Adequacy of medical service resources						
Level 1 (most adequate)	Reference		Reference		Reference	
Level 2 (more adequate)	0.850(0.549– 1.316)	.466	0.687(0.440– 1.071)	.097	0.624(0.402– 0.969)	.036*
Level 3 (neutrality)	0.490(0.312– 0.770)	.002**	0.320(0.202– 0.506)	< .001***	0.306(0.194– 0.482)	< .001***
Level 4 (less adequate)	0.418(0.262– 0.669)	< .001***	0.314(0.196– 0.505)	< .001***	0.292(0.182– 0.467)	< .001***
Level 5 (least adequate)	0.281(0.138– 0.572)	.001**	0.122(0.055– 0.271)	< .001***	0.141(0.066– 0.302)	< .001***
Balance of medical service resources' distribution						
Level 1 (most balanced)	Reference		Reference		Reference	
Level 2 (more balanced)	1.357(0.696– 2.644)	.370	0.829(0.407– 1.687)	.605	1.425(0.733– 2.772)	.296
Level 3 (neutrality)	0.892(0.455– 1.747)	.739	0.513(0.251– 1.048)	.067	0.755(0.386– 1.477)	.412

High Satisfaction Levels in Health Regulation						
Level 4 (more uneven)	0.937(0.479–1.836)	.851	0.544(0.267–1.112)	.095	0.799(0.409–1.560)	.511
Level 5 (most uneven)	0.706(0.336–1.484)	.358	0.517(0.238–1.121)	.095	0.713(0.340–1.491)	.369
Market-oriented and insufficiently public of public health services						
Level 1 (most serious)	Reference		Reference		Reference	
Level 2 (more serious)	1.225(0.921–1.629)	.164	1.731(1.283–2.334)	< .001 ^{***}	1.502(1.112–2.028)	.008 ^{**}
Level 3 (neutrality)	1.417(1.060–1.894)	.019 [*]	1.858(1.370–2.520)	< .001 ^{***}	1.705(1.256–2.313)	.001 ^{**}
Level 4 (not too serious)	2.519(1.840–3.449)	< .001 ^{***}	3.443(2.481–4.778)	< .001 ^{***}	2.639(1.901–3.665)	< .001 ^{***}
Level 5 (not serious at all)	3.616(1.690–7.736)	.001 ^{**}	4.364(1.983–9.604)	< .001 ^{***}	2.843(1.334–6.059)	.007 ^{**}
Convenience of access to public health services						
Level 1 (most convenient)	Reference		Reference		Reference	
Level 2 (more convenient)	0.603(0.448–0.810)	.001 ^{**}	0.675(0.500–0.911)	.010 [*]	0.730(0.542–0.984)	.039 [*]
Level 3 (neutrality)	0.429(0.312–0.589)	< .001 ^{***}	0.435(0.316–0.600)	< .001 ^{***}	0.471(0.342–0.649)	< .001 ^{***}
Level 4 (not too convenient)	0.374(0.266–0.527)	< .001 ^{***}	0.403(0.285–0.568)	< .001 ^{***}	0.437(0.309–0.617)	< .001 ^{***}
Level 5 (not convenient at all)	0.617(0.348–1.094)	.099	0.524(0.283–0.969)	.040 [*]	0.856(0.483–1.517)	.594
† <i>P</i> for logistic regression. * <i>P</i> < 0.05, ** <i>P</i> < 0.01, *** <i>P</i> < 0.001						
‡ include urban medical insurance, new cooperative medical insurance, and public medical insurance.						
§ include rural pension, urban residents' pension,						

Table 4

Multivariable Logistic Regression Models of Predictors for High Satisfaction Levels in Health Management

High Satisfaction Levels in Health Management						
	Urban and rural residents' health file service		Chronic disease management		Severe mental illness management	
	OR	<i>p</i> [†]	OR	<i>p</i> [†]	OR	<i>p</i> [†]
Sex						
Male	Reference		Reference		Reference	
Female	0.971(0.856–1.102)	.653	0.990(0.867–1.132)	.889	0.919(0.799–1.056)	.234
Age						
≤ 30	Reference		Reference		Reference	
31–50	1.120(0.849–1.477)	.422	1.404(1.046–1.886)	.024*	0.828(0.610–1.125)	.228
51–69	1.117(0.897–1.391)	.322	1.354(1.066–1.720)	.013*	0.984(0.774–1.251)	.895
≥ 70	1.120(0.849–1.477)	.422	1.404(1.046–1.886)	.024*	0.828(0.610–1.125)	.228
Education level						
Elementary school level or below	Reference		Reference		Reference	
Junior/senior middle school or technical secondary school	1.323(1.127–1.553)	.001**	1.022(0.866–1.206)	.799	0.982(0.824–1.170)	.838
Undergraduate or above	1.144(0.899–1.456)	.274	1.025(0.794–1.322)	.851	1.117(0.859–1.452)	.408
Hukou						
Rural resident	Reference		Reference		Reference	
Non-rural resident	1.108(0.956–1.283)	.173	0.919(0.786–1.073)	.286	1.023(0.869–1.203)	.789
Perceived household income						
Below average	Reference		Reference		Reference	

High Satisfaction Levels in Health Management						
Average	1.043(0.907– 1.199)	.557	1.067(0.920– 1.237)	.391	1.057(0.904– 1.235)	.486
Above average	1.404(1.094– 1.801)	.008**	1.197(0.920– 1.558)	.180	1.402(1.072– 1.832)	.013*
Access to medical insurance[‡]						
No	Reference		Reference		Reference	
Yes	1.426(1.128– 1.804)	.003**	1.050(0.822– 1.340)	.696	1.107(0.858– 1.428)	.435
Access to pension[§]						
No	Reference		Reference		Reference	
Yes	1.318(1.132– 1.534)	< .001***	1.406(1.195– 1.653)	< .001***	1.307(1.103– 1.549)	.002**
Adequacy of medical service resources						
Level 1 (most adequate)	Reference		Reference		Reference	
Level 2 (more adequate)	0.786(0.505– 1.224)	.287	1.097(0.708– 1.700)	.680	0.751(0.486– 1.160)	.197
Level 3 (neutrality)	0.422(0.268– 0.665)	< .001***	0.571(0.363– 0.900)	.016*	0.427(0.271– 0.672)	< .001***
Level 4 (less adequate)	0.338(0.211– 0.540)	< .001***	0.490(0.306– 0.787)	.003**	0.356(0.222– 0.572)	< .001***
Level 5 (least adequate)	0.285(0.150– 0.538)	< .001***	0.253(0.123– 0.522)	< .001***	0.155(0.068– 0.350)	< .001***
Balance of medical service resources' distribution						
Level 1 (most balanced)	Reference		Reference		Reference	
Level 2 (more balanced)	1.595(0.815– 3.120)	.173	1.057(0.545– 2.050)	.870	1.296(0.671– 2.501)	.440
Level 3 (neutrality)	0.962(0.490– 1.888)	.909	0.664(0.340– 1.296)	.230	0.725(0.373– 1.409)	.343

High Satisfaction Levels in Health Management						
Level 4 (more uneven)	1.017(0.518–1.997)	.960	0.592(0.303–1.154)	.124	0.641(0.330–1.247)	.190
Level 5 (most uneven)	1.164(0.563–2.408)	.683	0.653(0.314–1.356)	.253	0.512(0.243–1.081)	.079
Market-oriented and insufficiently public of public health services						
Level 1 (most serious)	Reference		Reference		Reference	
Level 2 (more serious)	1.200(0.926–1.556)	.168	1.107(0.837–1.466)	.476	0.993(0.743–1.328)	.962
Level 3 (neutrality)	1.305(0.999–1.705)	.051	1.104(0.828–1.471)	.500	0.869(0.645–1.171)	.357
Level 4 (not too serious)	2.305(1.715–3.096)	< .001 ^{***}	1.567(1.146–2.143)	.005 ^{**}	1.359(0.985–1.877)	.062
Level 5 (not serious at all)	1.708(0.801–3.640)	.166	1.431(0.673–3.044)	.352	1.515(0.708–3.245)	.285
Convenience of access to public health services						
Level 1 (most convenient)	Reference		Reference		Reference	
Level 2 (more convenient)	0.586(0.434–0.792)	.001 ^{**}	0.476(0.354–0.640)	< .001 ^{***}	0.555(0.413–0.748)	< .001 ^{***}
Level 3 (neutrality)	0.377(0.275–0.519)	< .001 ^{***}	0.375(0.273–0.514)	< .001 ^{***}	0.478(0.347–0.659)	< .001 ^{***}
Level 4 (not too convenient)	0.384(0.274–0.538)	< .001 ^{***}	0.335(0.238–0.472)	< .001 ^{***}	0.451(0.318–0.639)	< .001 ^{***}
Level 5 (not convenient at all)	0.350(0.196–0.625)	< .001 ^{***}	0.591(0.336–1.040)	.068	0.710(0.385–1.310)	.273
† <i>P</i> for logistic regression. * <i>P</i> < 0.05, ** <i>P</i> < 0.01, *** <i>P</i> < 0.001						
‡ include urban medical insurance, new cooperative medical insurance, and public medical insurance.						
§ include rural pension, urban residents' pension,						

For sociodemographic characteristics associated with satisfaction in health regulation items (Table 3), people with average perceived household income were not likely to report high satisfaction levels with essential drug regimes compared with those with below-average income. Those with non-rural resident hukou (compared with rural residents) were not likely to report high satisfaction levels with drug safety management service, while people having medical insurance (compared with no medical insurance) were more likely to report it.

For sociodemographic characteristics associated with satisfaction in health management items (Table 4), people with secondary school education level (compared with elementary school level or below), above-average perceived household income (compared with below-average income), having the medical insurance (compared with no medical insurance) and pension (compared with no pension) were more likely to report high satisfaction levels with urban and rural residents' health file service. People with age above 30 and having a pension (compared with no pension) were more likely to report high satisfaction levels with chronic disease management service. Lastly, people with above-average perceived household income (compared with below-average income) and having a pension (compared with no pension) were more likely to report high satisfaction levels with severe mental illness management service.

Concerning the factors about the evaluation of medical resource allocation, for all the 6 items that measure the satisfaction with services of public health management, adequacy of service resources, market-oriented and insufficiently public of public health services, convenience of access to public health services were all significantly associated with them (only except the association between market-oriented and insufficiently public of public health services and severe mental illness management service). Besides, the balance of medical service resources' distribution was not significantly associated with high satisfaction levels with all the 6 items.

As shown in Table 3 and Table 4, People with the lower evaluation of the adequacy towards medical service resources and convenience of access to public health services were not likely to report high satisfaction levels with services of public health management for all the 6 items. However, people who believed that the market-oriented and insufficiently public of public health services were less serious were all more likely to report high satisfaction levels for all the items except severe mental illness management service. In addition, the balance of medical service resources' distribution is also not significantly associated with severe mental illness management service based on evidence from China.

Discussion

This study examined the association between sociodemographic characteristics and factors of evaluation of medical resource allocation associated with high satisfaction with the services of public health management in the China context. Specifically, we examined the association between medical resource allocation and satisfaction with specific service content of public health management.

For the link between sociodemographic characteristics and satisfaction with services of public health management, so far, it still remains uncertain. Judging from the relevant conclusions of other scholars, most of the studies have examined the correlation between demographic factors such as age, gender, health status, and level of education with patient satisfaction; however, the findings from these studies are conflicting. Some studies have found that male patients, patients older than 50 years old, are more satisfied with health

services^[24]. Other studies have found that age, gender, and education do not significantly affect health service satisfaction^[25].

However, to summarize the above conclusions, the findings of this article further show that, for different service projects and areas, the link between satisfaction with health service and residents' characteristics also depends on specific service content. For example, in health management items, the demographic characteristics that significantly affect people's reporting high satisfaction levels with urban and rural residents' health file service are not the same as those that affect that with chronic disease management service.

Besides, in our findings, the least people reported high satisfaction levels with severe mental illness management service. Maybe this service is only for a small number of groups, and most groups have little to do with this service.

For the association between medical resource allocation and satisfaction with services of public health management, this study shows that medical resource allocation does affect satisfaction with services of public health management based on evidence from China. Among factors of evaluation of medical resource allocation, adequacy of medical service resources, market-oriented and insufficiently public of public health services, and convenience of access to public health services were all significantly associated with high satisfaction levels overall except balance of medical service resources' distribution.

These conclusions are also consistent with other relevant research results. Satisfaction with the healthcare system is more strongly related to some institutional arrangements, especially the allocation of medical resources.

That is to say, for the adequacy issue of health service resources, the rapid increase of health care costs, and the insufficient financial subsidies from the health insurance system may result in the health management dissatisfaction^[26]. Also, the health expenditures provided financial supply importantly shape and positively affect the patient satisfaction^[27]. For the publicity issue of health service resources, some scholars believe that market-oriented methods may put those vulnerable patients at great risk^[28]. European cases show that dissatisfaction with healthcare systems is related to the co-payments ratio. The fewer general practitioners and higher co-payments contribute to the lower overall level of healthcare service satisfaction^[29]. For the convenience of access to public health services, the satisfaction of health services is significantly affected by the accessibility of medicine and health services^[30]. However, among factors of evaluation of medical resource allocation, people's perception of the balance of service resources' distribution has no statistical correlation with the satisfaction of health management in China. Therefore, the focus of China's policy should be how to improve the adequacy, publicity of medical services, and convenience of access to public health services.

Conclusion

This article finds that there is a link between medical resource allocation and satisfaction with the services of public health management. Among factors of evaluation of medical resource allocation, adequacy of medical service resources, market-oriented and insufficiently public of public health services, and convenience of access to public health services were all significantly associated with satisfaction with services of public health management except the balance of medical service resources' distribution.

Our findings also further show that, the link between satisfaction with health service and residents' characteristics also depends on specific service content. The link between satisfaction with health service and residents' characteristics should be examined according to specific medical and health services. That is to say, for different service projects and areas, the link between satisfaction with health service and residents' characteristics is full of differences, and also depend on specific service content.

Especially, medical resource allocation does affect satisfaction with services of public health management. It is necessary to improve the adequacy, publicity of medical services, and convenience of access to public health services in China. Further research should focus on how interventions could help persons to consume services of public health management, despite progression of the changing environments.

List Of Abbreviations

CGSS: Chinese General Social Survey;

OR: Odds Ratio.

Declarations

Ethics approval and consent to participate

After ethical approval, the Chinese General Social Survey (CGSS) launched in 2003, is the earliest national representative continuous survey project run by academic institution in China mainland. We used the public data of CGSS, no additional ethics approval was needed.

Consent for publication

Not applicable.

Availability of data and materials

The datasets used and/or analysed during the current study are available on the CGSS official website (<http://cgss.ruc.edu.cn/>).

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

Shangren Qin conceived the idea and design of this study and wrote the manuscript. Xiaohe Wang guided data analysis work and revised the manuscript. All authors read and approved the final manuscript.

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