Influential Factors and Heterogeneity on Physician Performance in Online Health Communities Based on Patients' Psychology: Take the Good Physician Online as an Example

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Abstract: With the rapid development of Internet healthcare, online health communities in China have flourished and become an effective means of solving the major practical problems of residents, such as "difficult to register" and "difficult to see a physician". By taking part in online health communities, physicians may reap the advantages for themselves and their patients as well as gain recognition and money simultaneously. This paper selects the data of 7872 physicians on the Good physician Online as the research sample, and find that online and offline evaluation, online and offline satisfaction and gift numbers all have a significant effect on the amount of online inquiries, and articles has a non-significant effect, while there is a heterogeneity in the effect of different traits of hospitals and physicians on physician performance. This paper concludes that when choosing a physician online, patients typically favor physicians with more evaluations, higher satisfaction and title, indicating a preference for specialized treatment during the consultation stage and thorough, methodical integrated healing during the recovery stage. With the goal to meet patients' health needs and improve their own performance, physicians must be patient-focused, combine the psychological tendencies of patients, continuously offer patients higher-quality medical services.

Keywords: Online Health Communities; Physician Performance; Two-way Fixed Effects Modeling; Patients' Psychology

1. Introduction

The traditional offline consultation medical service model is no longer able to meet the rising demand for healthcare services due to the growing global population, the shortage of healthcare resources, the unequal distribution of healthcare resources, and the asymmetry of information between physicians and patients[1]. The "Healthy China 2030" plan, which reflects the leadership's priority on creating a healthy China was released by the Chinese government in 2016 and intends to improve national health and advance the development of a healthy China. The Chinese government issued the Opinions on Promoting the Development of "Internet+Medical Health" in April 2018, which outlines the direction of the growth of China's Internet healthcare industry, for the first time explicitly suggested that medical consortia actively use Internet technology to conveniently carry out services like appointment diagnosis and treatment, two-way referrals, and telemedicine, among other things.

China boasts 1.067 billion Internet users as of December 2022, with a 75.6% Internet penetration rate [2]. As a result of the widespread use of Internet technology and the generalization of Internet use, the number of online medical consultations is rising daily [3]. As of October 2022, over 2,700 Internet hospitals had been established nationwide, offering Internet-based diagnostic and treatment services to over 25.9 million individuals, according to the Digital China Development Report 2022 [4].

Online health communities (OHCs) are becoming increasingly attractive to residents as a result of the COVID-19 outbreak, which has once again intensified the conflict between the availability of medical services and the population's needs for health care [5-6]. In light of the current circumstances, the Chinese government has increased its

focus on the role that Internet medical care performs in advancing the equality of fundamental public services and has been implementing new laws on an ongoing basis to support the industry's steady growth. The requirements for the high-quality development of "Internet + Healthcare" were once again outlined in the Opinions on Further Improving the Medical and Healthcare Service System, released by the Chinese government in March 2023. These requirements included accelerating the use of artificial intelligence and cloud computing in the medical and healthcare field as well as strengthening the development of the healthcare big data sharing, exchange, and safeguard system.

A fresh avenue for growth for the Chinese medical sector is represented by OHCs [7]. Through OHCs, healthcare professionals are increasingly informing patients regarding the progress of specialist visits, physician assessments, online appointments, and other services [8]. In order to better understand patients' needs and preferences, enhance healthcare services, and strengthen the physician-patient relationship, this paper aims to both explore the factors influencing physician performance in OHCs and further investigate its reflection of the psychological role of patients when choosing a physician.

2. Literature Review

The deep integration of cloud computing, the Internet of Things, big data, and other information technologies with traditional medical and health services is known as "internet healthcare," which has given rise to a new medical service sector.[9-11]. The online health community is a platform that relies on the Internet to offer users medical services, health management, and other activities related to health information exchange, which is a significant example of Internet healthcare [12–14]. A user's quality of life and ability to control their own health can both be somewhat improved by participating in OHCs [15]. Most of the domestic and international studies on OHCs focus on one aspect and most of them are from the perspective of patients, such as: factors influencing users' willingness to disclose private health information[16-17]; factors influencing users' non-continuous use behaviors[18]; the influence of physicians' responsiveness and frequency of physician-patient interactions on patients' decision-making[19]; factors influencing patients' trust in their physicians[20], and factors influencing users' engagement behavior influencing factors[21]. Meanwhile, studies have shown that lucrative financial rewards have a positive impact on both physicians' online health community participation contributions [22] and reputational incentives [23].

Prior academic research on factors influencing physician performance in OHCs has been conducted from two main perspectives. The first type starts from the perspective of platform function. Some scholars have pointed out that the convenience of the Internet platform will improve the efficiency of communication between physicians and patients, thus bringing positive effects on physician performance [24]. Perron et al. argued that the information feedback mechanism established by the platform can effectively improve physician performance [25]. The second strand of literature explores the personal characteristics of physicians, focusing particularly on their reputation and experience. A physician's reputation is the main source of information for patients about the quality of physician services [26]. Patients usually perceive that physicians with low reputation also provide more low-quality healthcare services, which reduces patients' willingness to choose [27]. Meanwhile, Kelly et al. confirmed that experienced physicians can accurately judge and predict patients' conditions, which is conducive to gaining patients' trust and reducing the occurrence of physician-patient conflicts, thus improving physicians' work efficiency, and further improving physicians' performance [28]. physicians with good reputation can get higher attention from patients and have a significant positive effect on patient choice [29].

In recent years, some scholars have begun to pay attention to team factors. For example, Li et al. found that the effect of team size on individual performance was positively U-shaped, and it would weaken the effect of multiple team memberships on individual performance [30].Yang et al. extended the

study of physicians' individual characteristics to hospital groups, and concluded that both the diversity of reputation and experience of the physician team positively affect team performance[31].Si et al. showed that the gender of the team members and the type of departmental diversity positively and negatively affect team performance, respectively [32]. In addition, the gender, department and hospital of the physician are important factors influencing patients' attitudes and behaviors [33-35], and patients may pay attention to information related to the personal, departmental, and hospital levels of the team member physicians when choosing a treatment team.

To summarize, the academic community mainly focuses on the influence mechanism of physicians' performance in OHCs from the perspectives of platform functions, individual physicians and physician teams, but there are few studies in the academic community on the influence mechanism of physicians and hospitals with different attributes on physician performance based on the patients' phychology.

3. Research Design

3.1 Data Sources

The data for this paper comes from one of the largest OHCs in China: the Good physician Online [36-37], for two reasons: first, the website provides useful information from the perspectives of the patient (number of online inquiries, comprehensive consultation records, patient satisfaction with the consultation process), the physician (title, publications, etc.), and the hospital (level and kind). Second, the data is trustworthy since the platform compels physicians to authenticate using their genuine names. A total of 7,872 physicians' relevant data were obtained between January and December 2019 during a one-month window using the Python program. Of these, 4,000 physicians' data will be used for model estimation and empirical research, and the remaining data will be used for robustness tests.

3.2 Variable Declaration

The dependent variable in this research is the number of online inquiries (OIN), which is made up of the number of online consultations (OCN) and post-diagnosis management (PMN). Since OIN accounts for the majority of physicians' online income, it seems sense to apply it as a first-level indication of physician performance. Online consultation refers to the procedure by which patients ask physicians directly about their ailments and proposed courses of treatment via a website; post-diagnosis management is the process by which patients use the internet to further manage any changes in their conditions and the healing process following a consultation. Therefore, it is feasible to use OCN and PMN as the second-level indicators of physician performance representation.

Multidimensional indicators that are available on the platform are among the independent variables that were employed in this paper. First, there are parallels between e-commerce platforms and OHCs in that the quantity of patient reviews somewhat indicates the quality of care the physician provides, and the website lets users rate the physician's online and offline services independently. As a result, both online and offline evaluations are included in the first category of independent variables.

The patient's level of satisfaction with the physician's care is the second independent variable. Patients can select "satisfied" or "dissatisfied" when evaluating the physician's online service; these options are set to 1 and 0. Similarly, when evaluating the physician's offline service, patients can select "very satisfied," "satisfied," "average," and "dissatisfied," which are set to 4-1, respectively. The average of these choices will be used as the monthly satisfaction level of each physician.

The number of articles that physicians post on the platform each month concerning health, condition diagnosis, and various related topics makes up the third category of independent variables. The quantity of presents the physician has received is the fourth category. When a patient is pleased with a physician's care, they have the option to freely offer the physician a virtual present at the website. The physician receives the gift from the website after a percentage of the cost is subtracted as part of the physician performance.

This paper sets the physician's title, whether multidisciplinary consultation is available,

whether private consultation (providing individualized and exclusive consultation services to patients) is available, whether appointment registration is available, and the level and type of hospital the physician is in as dichotomous variables in order to investigate the effects of various characteristics of physicians and hospitals on physician performance. Table 1 shows the names and definitions of the variables given in this paper. (See Table 1)

3.3 Model Construction

Based on the above, this paper constructs the theoretical model shown in Figure 1. (See Figure 1)

Table 1. Variables Description

Variable	Definition
OIN	The total number of monthly online inquiries by physicians
OCN	The total number of monthly online consultations by physicians
PMN	The total number of monthly post-diagnosis managements by physicians
Online Evaluations	Number of monthly evaluations regarding online services
Offline Evaluations	Number of monthly evaluations regarding offline services
Online Satisfaction	Average number of online satisfaction received by physicians each month
Offline Satisfaction	Average number of offline satisfaction received by physicians each month
Articles' Number	Number of relevant articles published by physicians each month
Gifts' Number	Number of gifts that physicians received monthly from patients
Physician's Title	Binary variable denoting physician title, senior title = 1, non-senior title = 0
Multidisciplinary Consultation	Binary variable indicating whether or not the physician is open to multidisciplinary consultation, open = 1, not open = 0
Private Consultation	Indicates whether the physician provides personalized and exclusive treatment services for the patient, enabled=1, not enabled=0
Appointment Registration	Indicates whether the physician is open for appointment registering, open=1, not open=0
Hospital Level	Binary variable indicating hospital level, tertiary hospital = 1, non-tertiary hospital = 0
Hospital Type	Binary variable indicating hospital type, general hospital = 1, specialty hospital = 0

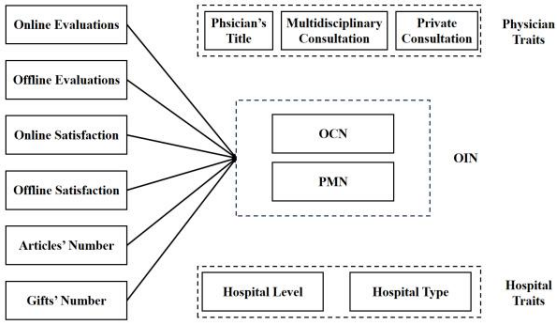

Figure 1. Theoretical Model

Based on the above theoretical model, this paper constructs the following empirical model:

$$Y_{it}=\beta X_{it}+\gamma_2 D2_t+\cdots+\gamma_t \mathrm{DT}_t+\mathrm{u}_i+\varepsilon_{it} \quad (1)$$

In this empirical model, i represents individuals and t represents time. Y_{it} is the dependent variable and X_{it} is the independent variable. T=12, representing 12 months of observation for this experiment. $D2_t$ to DT_t is a dummy variable that, for any DM_t, DM_t=1 when M = t and 0 otherwise. u_i represents individual heterogeneity and ε_{it} is a perturbation term that varies with individual and time.

4. Empirical Research

4.1 Model Analysis

Initially, each variable underwent a covariance test. The regressions of OIN, OCN, and PMN were regressed, yielding the Variance Inflation Factor (VIF), which revealed that all of the VIFs are less than 5, indicating the absence of covariance among the variables. Second, the correlation analysis's findings also show that the variables do not strongly correlate with one another. In order to eliminate unobservable individual heterogeneity, this study employs a two-way fixed-effects model for model estimate and analysis. The model is chosen based on the complexity of physician, hospital, and patient characteristics as well as the Hausman test results. Table 2 displays the results of the regression.(See Table 2)

For OIN, online and offline evaluations, online and offline satisfaction, and gifts' number are significant at the 1% level, while articles' number is not; for OCN, online evaluations is significant at the 1% level, online and offline satisfaction are significant at the 10% level, and articles' number and gifts' number are not; and for PMN, online and offline evaluations and gifts' number are significant at the 1% level, and online satisfaction are significant at the 5% level, the articles' number is not significant. Therefor, Patients seem to favor phsicians who receive more evaluations and higher satisfaction ratings, and they do not seem to be paying attention to the articles that physicians publish on the platform. This suggests that there is a strong correlation between patient satisfaction ratings, reviews of treatment services, and physician performance. Simultaneously, virtual gifts that physicians received from their patients emerged as the primary online revenue stream for physicians, operating on a process akin to that of Internet media. Due to their varying emphasis on the patient consultation and service process, the impacts of the factors on OCN and PMN varied somewhat in significance when seen from an individual perspective.

Table 2. Benchmark Regression Results

	OIN	OCN	PMN
Online Evaluations	2.9351*** (0.2348)	1.2630*** (0.2104)	1.1983*** (0.1355)
Offline Evaluations	0.9698*** (0.1396)	-0.0226 (0.0457)	0.8768*** (0.1055)
Online Satisfaction	3.8242*** (1.4236)	1.6376* (0.6339)	2.2780** (1.1370)
Offline Satisfaction	1.9075*** (0.5485)	0.9399* (0.3518)	0.5332 (0.4091)
Articles' Number	0.0850 (0.0994)	0.0935 (0.0628)	-0.0066 (0.0332)
Gifts' Number	0.9111*** (0.2729)	0.0956 (0.0896)	0.7495*** (0.2274)
Time Effect	√	√	√
Individual Effect	√	√	√
Constant Term	9.8164	1.2932	6.4682
R^2	0.4928	0.4380	0.3174

Note: ***, **, and * denote significant at the 1%, 5%, and 10% levels, respectively; robust standard errors within ( ), same below.

4.2 The Impact of Physician Traits on Physician Performance

The effect of physician title on physician performance is shown in Table 3. (See Table 3) According to the findings, patient assessments have a significant influence on a physician performance whether or not they have a senior Title. However, the number of gifts and online satisfaction have a greater impact on senior physicians, while offline satisfaction has a larger impact on physicians with non-senior titles. This suggests that patients are prone to consult senior physicians when seeking online advice, which is further supported by the notable difference in the intercept of the two. Patients are more likely to choose physicians with non-senior titles during an offline consultation. This could be due to the fact it is challenging for patients to obtain advice from physicians with senior titles offline and the resources of prominent physicians are still insufficient to meet the population's enormous medical needs.

The effect of whether a physician opens a multidisciplinary consultation on physician performance is shown in Table4. (See Table 4) For physicians who opened multidisciplinary consultations, online and offline evaluations have a strong significant effect on OIN, OCN, and PMN; online satisfaction has a significant effect only on OCN, and offline satisfaction has no effect on PMN. In contrast, for physicians without multidisciplinary consultation, offline evaluations have no

significant effect on OCN, and online satisfaction has a more significant effect on OIN. Furthermore, for OIN, patients' preferences for specialized treatment are indicated by the intercept for physicians who do not open a multidisciplinary consultation being significantly higher than that of physicians who do, indicating that patients prefer specialized treatment; in contrast, for PMN, patients' preferences for post-diagnosis management are more inclined toward physicians with multidisciplinary backgrounds, resulting in more thorough and organized post-diagnosis management.

The effect of whether or not to offer private consultations on physician performance is shown in Table 5. (See Table 5) The results show that for physicians who offer private consultations, the online evaluations has a significant effect on OIN, OCN, and PMN, while offline evaluation and gifts' number do not have a significant effect on OCN;the influence of online satisfaction and articles' number is not significant, and offline satisfaction is significant. In comparison, for physicians without private consultation, online satisfaction has a significant effect on OIN and OCN, offline satisfaction only has a significant effect on OCN, and gifts' number does not have a significant effect on OIN. Conversely, the intercept for OIN indicates that physicians who receive private consultation services have a higher income than physicians who do not, indicating that providing private consultation services can benefit physicians more financially.

The effect of whether or not to open appointment registration on physician performance is shown in Table 6. (See Table 6) The results show that for physicians who open appointment registration, online evaluations and gifts' number have a significant effect on OIN, OCN, and PMN, and offline evaluations has a significant effect on OIN and PMN; both online and offline satisfaction have a significant effect on OCN only. In contrast, for physicians who do not have appointment registration, offline satisfaction has a significant effect on OIN, OCN, and PMN. Patients are more likely to choose physicians who allow them to register for appointments based on the difference in intercepts between the two, enabling them justify their own visit duration.

Table 3. The Effect of Physician Title

	Senior Title			Non-senior Title		
	OIN	OCN	PMN	OIN	OCN	PMN
Online Evaluations	2.7477*** (0.2456)	0.9056*** (0.0917)	1.3981*** (0.1613)	3.4831*** (0.5393)	2.3234*** (0.6745)	0.6043*** (0.1787)
Offline Evaluations	0.9849*** (0.1515)	0.0230 (0.0436)	0.8449*** (0.1152)	0.9093*** (0.2353)	-0.2888** (0.1299)	1.0832*** (0.1478)
Online Satisfaction	3.8522*** (1.4218)	1.5652*** (0.5328)	2.5163** (1.2481)	2.4144 (4.3843)	0.6238 (2.4889)	1.4660 (2.5624)
Offline Satisfaction	0.8378 (0.5975)	0.1339 (0.0619)	0.6651 (0.5165)	3.0107*** (0.9931)	1.2994** (0.6482)	0.7007 (0.5703)
Articles' Number	0.0697 (0.0999)	0.0954 (0.0619)	-0.0140 (0.0337)	0.6353** (0.2993)	0.2570 (0.2190)	0.0828 (0.1233)
Gifts' Number	1.0029*** (0.2955)	0.2053*** (0.0760)	0.7415*** (0.2470)	0.2316 (0.4479)	-0.6174* (0.3605)	0.6510*** (0.2167)
Constant Term	14.5393	5.1408	5.8481	3.9745	-1.2672	4.4254
R^2	0.5132	0.4553	0.3266	0.3950	0.3522	0.2930

Table 4. Impact of the Availability of Multidisciplinary Consultation

	Multidisciplinary Consultation			Non-multidisciplinary Consultation		
	OIN	OCN	PMN	OIN	OCN	PMN
Online Evaluations	2.1212*** (0.3894)	0.5386*** (0.1484)	1.3546*** (0.2819)	3.1205*** (0.2625)	1.4334*** (0.2458)	1.1621*** (0.1517)
Offline Evaluations	1.0872*** (0.2400)	0.0995* (0.0590)	0.7683*** (0.1681)	0.9551*** (0.1653)	-0.0404 (0.0542)	0.9063*** (0.1268)
Online Satisfaction	8.9966 (6.8049)	3.3119*** (1.2169)	7.2676 (6.9859)	3.6036** (1.4379)	1.4656* (0.6528)	2.0931* (1.1483)

Offline Satisfaction	6.2129*** (1.9010)	1.4499*** (0.3635)	-0.8420 (1.7320)	1.7864*** (0.5426)	0.8833** (0.3454)	0.5708 (0.4178)
Articles' Number	-0.1061 (0.1658)	-0.1446 (0.0991)	0.0160 (0.0798)	0.1575 (0.1119)	0.1720*** (0.0493)	-0.0095 (0.0356)
Gifts' Number	1.53349** (0.6921)	0.0091 (0.1964)	1.4579*** (0.6084)	0.7628* (0.2971)	0.0961 (0.0958)	0.5959** (0.2453)
Constant Term	-2.0085	2.7394	9.5818	9.1453	0.9732	6.1763
R^2	0.4882	0.3352	0.3676	0.4939	0.4639	0.3001

Table 5. Impact of the Availability of Private Consultation

	Private Consultation			Non-private Consultation		
	OIN	OCN	PMN	OIN	OCN	PMN
Online Evaluations	2.9720*** (0.2594)	1.2635*** (0.2328)	1.2124*** (0.1493)	2.5170*** (0.2618)	1.2613*** (0.2280)	1.0150*** (0.1715)
Offline Evaluations	0.9664*** (0.1590)	-0.0373 (0.0524)	0.8676*** (0.1182)	0.9676*** (0.1688)	0.0755* (0.0427)	0.9228*** (0.1634)
Online Satisfaction	4.4690 (2.8893)	1.3724 (1.0185)	3.7944 (2.3868)	3.1032** (1.2015)	1.6587** (0.7399)	0.9910 (0.8187)
Offline Satisfaction	3.3420*** (0.9935)	1.0001** (0.46725)	1.3660* (0.7893)	0.7810 (0.4903)	0.8686* (0.4738)	-0.1840 (0.2306)
Articles' Number	0.0618 (0.1044)	0.1003 (0.0685)	-0.0243 (0.0333)	0.3125 (0.1940)	0.0194 (0.0406)	0.1699* (0.1028)
Gifts' Number	0.9790*** (0.3066)	0.1092 (0.0982)	0.7987*** (0.2561)	0.4146 (0.2573)	-0.0107 (0.1618)	0.3866** (0.1550)
Constant Term	8.1148	2.5678	4.1942	4.6503	-1.3352	4.8665
R^2	0.4795	0.4281	0.3043	0.4364	0.4207	0.2470

Table 6. Impact of Whether or not to Open Appointment Registration

	Appointment Registration			Non-appointment Registration		
	OIN	OCN	PMN	OIN	OCN	PMN
Online Evaluations	2.9138*** (0.3841)	0.9528*** (0.1545)	1.6857*** (0.2774)	2.9421*** (0.2966)	1.4743*** (0.3242)	0.8614*** (0.1094)
Offline Evaluations	0.7826*** (0.1983)	0.0205 (0.0628)	0.5910*** (0.1348)	1.1925*** (0.1757)	-0.0740 (0.0544)	1.2190*** (0.1567)
Online Satisfaction	-0.1022 (3.4079)	0.7998* (0.4710)	0.3580 (3.1090)	5.5410*** (1.5485)	1.7951** (0.8053)	2.9020** (1.1422)
Offline Satisfaction	3.6941 (2.7009)	1.0860* (0.5932)	0.1917 (0.5129)	1.9881*** (0.5519)	0.8582** (0.3517)	0.6747* (0.4075)
Articles' Number	-0.0401 (0.1607)	0.0140 (0.1321)	-0.0467 (0.0691)	0.1669 (0.1333)	0.1582*** (0.0490)	0.0081 (0.0351)
Gifts' Number	1.5010*** (0.5090)	0.2361* (0.1294)	1.1580*** (0.4272)	0.3756** (0.1750)	-0.0258 (0.1129)	0.3603*** (0.1224)
Constant Term	9.9598	3.4781	9.1032	5.7570	0.3267	5.4323
R^2	0.5187	0.4677	0.3532	0.4476	0.4000	0.2838

4.3 The Impact of Hospital Traits on Physician Performance

The effect on OIN is displayed in Table 7. (See Table 7) The results show that online evaluations has a significant influence on all levels and types of hospitals, offline evaluations has a non-significant and negative effect only on non-tertiary hospitals, online satisfaction and gifts' number have a significant positive effect on tertiary hospitals and general hospitals, articles' number has a greater effect on non-tertiary hospitals and specialty hospitals. Meanwhile, the intercept is smaller for tertiary hospitals than for non-tertiary hospitals.

The effects on OCN are shown in Table 8. (see Table 8) For hospital level, only online evaluations, online and offline satisfaction have significant positive effect. For hospital type, there are differences in the effects of offline evaluations, online satisfaction and articles' number on OCN, with significant effects of online evaluations and offline

satisfaction, no significant impact on gifts' number. Specialty hospital intercepts are substantially higher than general hospital intercepts, which show that patients prefer specialized care when seeking advice on their ailments and treatments.

The impact on PMN is shown in Table 9. (See Table 9) The results show that for different levels and types of hospitals, the difference in the impact of online evaluations is small and all have a significant positive impact, the impact of offline evaluations is not significant for non-Tertiary hospitals, and the impact of online satisfaction is more pronounced for tertiary and general hospitals. Also, in contrast to Table 8's findings, demonstrating that patients are more enthusiastic in receiving thorough and organized care throughout the rehabilitation treatment stage.

Table 7. The Impact of Hospital Traits on OIN

	OIN			
	Tertiary Hospital	Non-tertiary Hospital	General Hospital	Specialty Hospital
Online Evaluations	2.8854*** (0.2377)	3.9938*** (1.3402)	3.1390*** (0.2902)	2.3960*** (0.3402)
Offline Evaluations	1.0233*** (0.1403)	-0.3305 (0.6864)	0.7969*** (0.1581)	1.4239*** (0.2882)
Online Satisfaction	3.7332** (1.5030)	2.6725 (4.0009)	4.1575** (1.6653)	2.9130 (2.5356)
Offline Satisfaction	1.7505*** (0.5849)	3.3556** (1.6372)	1.4996** (0.6191)	2.8099** (1.1139)
Articles' Number	0.0691 (0.0986)	1.0922* (0.6180)	0.0262 (0.1066)	0.3728*** (0.1187)
Gifts' Number	0.9291*** (0.2783)	0.1340 (1.0600)	1.1503*** (0.3478)	0.3169 (0.4154)
Constant Term	10.0224	13.9763	9.7761	11.1988
R^2	0.5067	0.5707	0.4853	0.5116

Table 8. The Impact of Hospital Traits on OCN

	OCN			
	Tertiary Hospital	Non-tertiary Hospital	General Hospital	Specialty Hospital
Online Evaluations	1.3002*** (0.2196)	0.5754*** (0.2226)	1.4406*** (0.2739)	0.7796*** (0.1439)
Offline Evaluations	-0.0079 (0.0444)	-0.3616 (0.2380)	-0.0841 (0.0553)	0.1285* (0.0721)
Online Satisfaction	1.6234** (0.6784)	1.7916** (0.8885)	1.9941*** (0.7519)	0.5318 (0.7109)
Offline Satisfaction	0.9827** (0.4097)	0.8966** (0.4448)	1.0828** (0.4699)	0.6057** (0.2916)
Articles' Number	0.0893 (0.0642)	0.2699 (0.2334)	0.0558 (0.0709)	0.2754*** (0.1010)
Gifts' Number	0.0856 (0.0921)	0.3028 (0.2967)	0.0942 (0.1054)	0.1182 (0.1486)
Constant Term	1.1237	1.7613	-0.3893	6.0976
R^2	0.4424	0.3048	0.4599	0.3914

Table 9. The Impact of Hospital Traits on PMN

	PMN			
	Tertiary Hospital	Non-tertiary Hospital	General Hospital	Specialty Hospital
Online Evaluations	1.2109*** (0.1417)	0.9895*** (0.3669)	1.1790*** (0.1696)	1.2644*** (0.2055)
Offline Evaluations	0.8995*** (0.1088)	0.3263 (0.2513)	0.7891*** (0.1012)	1.1164*** (0.2789)
Online Satisfaction	2.4236**	-0.0267	2.3120*	2.1016

	(1.1955)	(3.1862)	(1.3678)	(2.1052)
Offline Satisfaction	0.6385 (0.4525)	0.6395 (1.1353)	0.2047 (0.4155)	1.2771 (0.9014)
Articles' Number	-0.0121 (0.0330)	0.2537 (0.2569)	-0.0002 (0.0352)	-0.0312 (0.0715)
Gifts' Number	0.7503*** (0.2327)	0.5332* (0.3143)	0.8720*** (0.2837)	0.4157 (0.3633)
Constant Term	5.8196	10.3879	7.3665	4.7692
R^2	0.3178	0.2786	0.3073	0.3457

To summarize, patients are more likely to select non-tertiary and specialty hospitals during treatment, as well as physicians with senior titles who can verify diagnosis and appointment. Patients are sometimes constrained by the realities of regional disparities in medical resources and personal wealth levels, even though they often desire specialized therapy and hope to acquire higher quality medical resources. In contrast, patients are more likely to turn to physicians who open multidisciplinary consultation and general hospitals at the post-diagnosis management stage because they anticipate receiving more thorough and organized medical care.

4.4 Robustness Test

This paper replaces the variables, measurement techniques, and data sources in a robustness test to increase the generalizability and persuasiveness of the research conclusions. The results are displayed in Table 10. (See Table 10) Initially, this research uses regression analysis to examine the data from the 3872 remaining physicians. The findings in Table 2 are largely supported by columns (1), (2), and (3). Second, the dependent variable is the number of effective post-diagnosis management, that is, records containing three or more physician-patient calls are considered effective. The results of Column (4) have been determined to be consistent with the original model through re-estimating the model. Thirdly, this paper runs a Poisson regression on OIN and column (5) is consistent with the results in Table 2.

Table 10. Robustness Test Results

	(1)	(2)	(3)	(4)	(5)
	OIN	OCN	PMN	EPMN	OIN
	New Sample Data			Original Sample Data	Poisson Regression
Online Evaluations	2.4855*** (0.2380)	1.1476*** (0.1812)	0.8225*** (0.0997)	0.8682*** (0.1123)	0.0193*** (0.0002)
Offline Evaluations	1.1417*** (1.1095)	-0.0194 (0.0386)	1.0015*** (0.0906)	0.4539*** (0.0731)	0.0078*** (0.0002)
Online Satisfaction	5.6764*** (1.4805)	3.1183*** (0.8370)	1.7009** (0.8422)	1.4433** (0.6511)	0.5561*** (0.0188)
Offline Satisfaction	3.1432** (1.4086)	1.1468 (0.7281)	0.2074 (0.4915)	0.2137 (0.2289)	0.1902*** (0.0087)
Articles' Number	0.1011 (0.0866)	0.0185** (0.0088)	0.0085 (0.0287)	0.0153 (0.0228)	-0.0002 (0.0001)
Gifts' Number	0.1210 (0.1587)	-0.1269 (0.0779)	0.3483*** (0.1158)	0.5756*** (0.2051)	0.0124*** (0.0004)
Constant Term	4.2280	-0.6990	9.1635	4.1666	
R^2	0.3652	0.3425	0.2295	0.3138	

5. Conclusions

This paper designs a two-way fixed model to investigate the heterogeneity and influencing factors of physician performance in OHCs, and it provides some theoretical contributions based on data from the Good physician Online. This paper first proposes a multilevel approach to physician performance research, utilizing two-level indicators to investigate the effects of independent variables on both the total and partial online inquiries. Second, this paper examines the factors that effect physician performance in OHCs from a

variety of angles. It discovers that while the number of gifts, online and offline evaluations, and online and offline satisfaction all significantly improve performance, the number of articles has no discernible effect. Lastly, this paper addresses if there are distinct processes of their effects on physician performance from the viewpoint of physicians and hospitals with varying features.

The goal of this paper is to offer beneficial guidance for the enhancement of physician performance and the steady growth of OHCs. First, physicians should concentrate on aspects that could boost their own performance in addition to raising the standard and caliber of self-service. Second, hospitals should make the best use of their unique characteristics and take appropriate action to raise the general caliber of their services. To be able to better address patients' urgent demands for online medical care, OHCs should subsequently give information about hospitals and physicians as thoroughly as possible, eliminating information asymmetry between patients and physicians to the maximum extent possible.

On top of that, this paper includes the following flaws. Firstly, the results can be spontaneous in that the decision of whether or not to choose multidisciplinary consultations by physicians is not randomized. Further research can take more detailed and in-depth measures to solve this problem. Secondly, the study solely takes into account the quantity of patient assessments; it ignores their emotional content. Follow-up studies can use sentiment analysis and other methods to study the impact of the emotional orientation of patient comments (positive and negative reviews) on physician performance. Third, as there was just one online health community from which the data for this article was gathered, more thought must be given to the conclusions' generalizability. Subsequent studies can enhance the universality of the conclusions by collecting more data from OHCs.

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