ORIGINAL RESEARCH

Analysis of Influencing Factors of Organizational Health Literacy in Healthcare Institutions in Beijing, China: A Cross-Sectional Study

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Objective: This study aimed to evaluate the organizational health literacy of healthcare institutions in Beijing and to analyse its influencing factors to provide suggestions for the construction of health-promoting medical institutions.

Methods: This study used multi-stage cluster sampling and conducted an online survey of medical staff in the sampled healthcare institutions in Beijing from May to July 2023. The Chinese version of the Health Literate Health Care Organization 10-item Questionnaire (HLHO-10-C) was used to assess the organizational health literacy of healthcare institutions. Univariate analysis and generalized linear models (GLM) were used to analyze the influencing factors.

Results: Finally, 2527 participants were included. The majority of participants were female (87.6%). More than half of the participants indicated that they had engaged in outpatient or inpatient health education work. The respondents' score for HLHO-10-C was 6.170±1.056. The score of the respondents from tertiary hospitals (6.003±1.167) was slightly lower than those from secondary hospitals (6.328±0.747) and primary healthcare centers (6.418±0.864). All healthcare institutions scored relatively high on institutional environmental construction support (6.284±1.034). The results of the GLM showed that educational level, healthcare institution level, and engagement in health education work were factors influencing HLHO-10-C ($P<0.05$).

Conclusion: Overall, the organizational health literacy of healthcare institutions in Beijing was relatively good. However, there is room for improvement in tertiary hospitals. In the future, to promote the construction of health-literate hospitals, targeted measures should be taken to encourage healthcare workers to engage in health education.

Keywords: health literate health care organization, Health literate, health education, hospitals

Introduction

The concept of health literacy was originally proposed by the American scholar Simonds at the International Conference on Health Education in 1974. Since then, research on health literacy has continued to increase. The World Health Organization has defined health literacy as "the ability of people to access, understand, and practice health information and services, using them to make appropriate decisions to promote their health". Research has shown that individuals with low health literacy are more vulnerable to diseases and are unable to make choices within complex healthcare services than those with good health literacy.[1] Health literacy has become a crucial concern for healthcare institutions and is closely related to the effectiveness and efficiency of health services and control of service costs.[2]

With the further study of health literacy, it has become clear that health literacy depends not only on the individual but also on the healthcare environment. Therefore, the United States Institute of Medicine Roundtable proposed a definition of health literate healthcare organization (HLHO) as "an organization that makes it easier for people to navigate, understand, and use information and services to take care of their health".[3] In addition, the conference discussed and

proposed 10 attributes that health literate healthcare organizations should possess.[4] Studies have revealed that most healthcare organizations lack patient engagement and have difficulties with doctor-patient communication, and patient compliance.[5] Health literacy promotion activities alone are not insufficient to improve patients' health literacy. The provision of high-quality healthcare services should align with patients' needs and expectations.[6] Therefore, healthcare organizations should prioritize the construction of HLHO to better serve the population.

Based on the 10 attributes of HLHO, scholars in various countries, including Austria, Australia, and New Zealand,[7] have developed concepts, theories, and measurement tools tailored to their national contexts. Trezona et al constructed a theoretical framework for describing a health literate healthcare organization in 2017[8] and used it as a measurement tool that was tested and refined in 2020.[9] Beyond conceptual and attribute studies, some scholars have also explored the promotion and hindrance of HLHO. Farmanova[5] reviewed previous theories, frameworks, guidelines, and issues of HLHO by analyzing the state of health literacy promotion carried out by healthcare organizations and HLHO construction.

To improve national health policies to meet people's growing need for well-being during the 14th Five-Year Plan period (2021–2025) in China, the General Office of the State Council has issued a plan that clearly stated the need to further promote the construction of health promoting hospitals. In addition, scholars have evaluated health literacy among the medical staff and patients. However, there are few studies on HLHO, mostly focusing on concepts and evaluation tools, with a scarcity of evaluation studies on the construction of HLHO. Tong Yingge et al published six related papers that initially studied evaluation tools for HLHO in the United States, including the Health Literacy Environment of Hospitals and Health Centers (HLEHHC), the Pharmacy Health Literacy Evaluation Tool, the Communication Climate Evaluation Toolkit (CCET), and the Health Literacy Assessment Toolkit (HLAT), and the Health Literacy Assessment Toolkit (HLAT). Assessment Toolkit (C-CAT) and HLHO-10 were analyzed for their applicability, reliability, and limitations.[10] Guidelines and suggestions were provided for the developing tools suitable for evaluating the construction of HLHO in China. Subsequently, they selected the American Health Literate Health Care Organization 10-item questionnaire (HLHO-10), translating and verifying its reliability and differentiation to assess the health education and promotion diligence of medical institutions and medical personnel in China.[11]

Above all, there was a wealth of international research on theoretical frameworks related to health literacy-promoting healthcare organizations, which provides the theoretical foundation for this study. And domestic scholars have primarily conducted theoretical studies, and few have assessed the construction of HLHO in China. Beijing, the capital of China, boasts of good healthcare resources and plays a pivotal role as a model for improving residents' health literacy. Therefore, the research question were what is the level of health literacy in Beijing's medical institutions and what factors affect the level of health literacy in the institutions. This study used the Chinese version of HLHO-10 (HLHO-10-C) to survey medical and nursing staff at all levels of healthcare institutions in Beijing to understand the construction of HLHO and analyze its influencing factors. This study could provide references and suggestions for improving the existing deficiencies of medical organizations and constructing high-quality health promoting medical institutions.

Materials and Methods

From May to June 2023, this study conducted an online survey of healthcare workers at all levels of healthcare institutions in the sampled Beijing municipalities using the Tencent questionnaire. Multistage cluster sampling was used to obtain representative samples. First, based on the division of functional areas, five districts were selected from the 16 municipal districts in Beijing, representing the Capital Functional Core Area (Dongcheng and Xicheng Districts), Urban Functional Expansion Area (Haidian District), New Urban Development Area (Tongzhou District), and Ecologically Enriching and Developing Area (Pinggu District). Then, simple random sampling was performed using Excel to select one tertiary and one secondary hospital from all healthcare institutions in each selected municipal district. Finally, using the department as the sampling unit, the entire cluster of personnel in healthcare institutions who met the inclusion criteria was selected as participants. In addition, eight community healthcare centers in Beijing were surveyed using convenience sampling.

The inclusion criteria were internal and surgical healthcare personnel in healthcare institutions. The internal included: gastroenterology, respiratory medicine, nephrology, neurology, endocrinology, and traditional Chinese medicine; the

surgical included: general surgery, urology, orthopedics, dentistry, ophthalmology, otolaryngology, obstetrics and gynecology, and vascular surgery. All participants should have at least 1 year of experience in the field of their specialty.

After identifying the healthcare institutions to be surveyed, the Beijing Patriotic Health Campaign Committee of the Beijing Municipal Health Commission issued "the Notice on the Training Meeting on the Questionnaire Survey on Health Education in Medical Institutions", inviting the person in charge of the health education work of the health commission of the sampling district, and the person in charge of the health education of healthcare institutions to participate in the meeting. The training meeting was held on May 19, 2023, during which the project leader introduced the survey programme (including the purpose, content, method, division of tasks, and work requirements, etc.) to the participants. A WeChat workgroup was established to facilitate the follow-up communication. The person in charge of each medical institution sent the QR code of the electronic questionnaire to the relevant department and completed data collection.

Sample

The required sample size for this study was calculated based on the sample size formula for a cross-sectional survey:[12] $n_1 = \left(\frac{\mu_{\alpha/2} \times \sigma}{\delta}\right)^2$. In this study, we used test level $\alpha=0.05$, $\mu_{\alpha/2}=1.96$, and permissible error $\delta=0.1$. According to the literature,[11] the standard deviation of the overall mean $\sigma=1.04$. Initially, we calculated the sample size $n_1 \approx 416$. Considering that the study population was a finite total, the sample size was corrected using the formula $n_2 = \frac{n \times N}{n+N}$, with N indicating the number of people included in the study total. According to "the Statistical Bulletin of Health Care Development in Beijing in 2021", the number of all health care workers in primary healthcare centers (PHC), secondary hospitals, and tertiary hospitals in Beijing in 2021 was N=192,860, so $n_2=415$. This study used multistage cluster sampling, with a final sample size $n_3=\text{deff} \times n_2$. We assumed deff=3, resulting in a sample size of 1245. In addition, the study collected at least 50 data from each PHC, for a total of 400 cases in eight PHCs. Considering the effect of invalid data, the sample size was increased by 20% and the final sample size should be at least 1974.

In total, 2824 questionnaires were collected for this study. The data were then cleaned to eliminate invalid data, including response times of less than 200 seconds[13,] and data with multiple missing items. Finally, 2527 valid questionnaires were included with a validity rate of 89.5%.

Measures

The questionnaire mainly included sociodemographic information and the HLHO-10-C. German scholars Kowalski et al[14] developed the HLHO-10 questionnaire in 2015, based on the HLHO 10 characteristics, to evaluate the construction of health literate healthcare organizations in terms of leadership support (items 1, 2, and 10), employee support (items 3, 4, 7, 8, and 9), and support for building the institutional environment (items 5 and 6). In 2021, Tong Yingge et al[11] adapted and validated the questionnaire to form the HLHO-10-C, and confirmed its reliability and validity. In this study, the KMO value of HLHO-10-C was 0.947, the result of Bartlett's spherical test was $P < 0.001$, and the Cronbach's alpha coefficient was 0.964, indicating that the questionnaire was suitable for factor analysis and had good internal consistency. The HLHO-10-C contains a total of 10 items, and the Likert 7-point scale from 1 (absolutely not) to 7 (very large extent). The sum of the scores of each item indicates the overall score of the questionnaire; the higher the score, the better the healthcare workers think their organization is doing in the construction of health literate health care institutions.

Statistical Analysis

Statistical analysis was performed using the JMP Pro software, version 16 (Copyright 2021 SAS Institute Inc., Cary, NC, USA). Percentage or mean ± standard deviation (SD) was used for statistical descriptions. As the HLHO-10-C scores did not satisfy a normal distribution, the Wilcoxon rank-sum test (two groups) or Kruskal–Wallis H-test (multiple groups) was used for group comparisons. Multifactorial analysis was performed using a generalized linear model (GLM) with Gamma distribution and maximum likelihood estimation. Statistical significance was set at $P<0.05$.
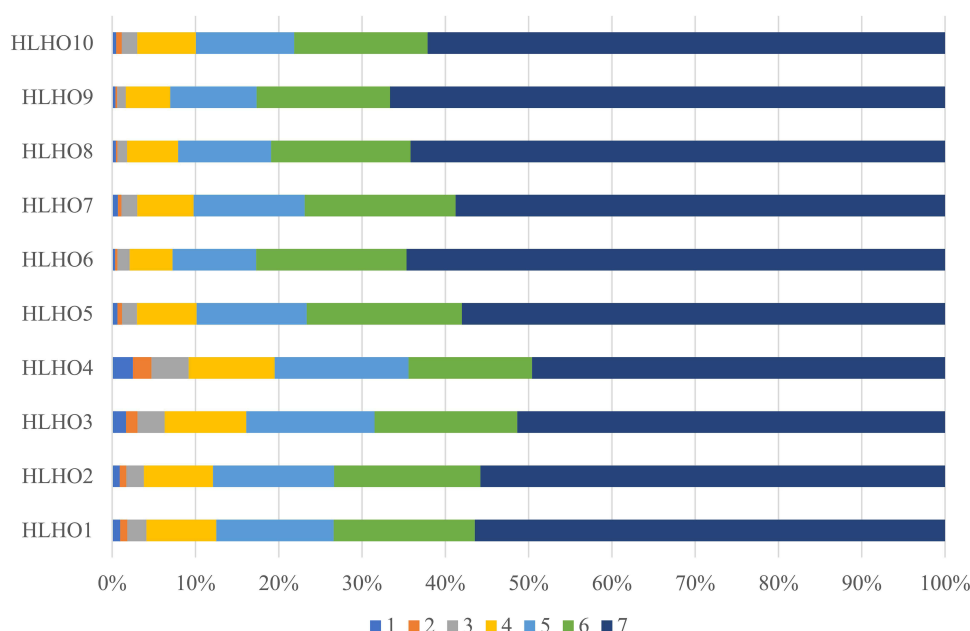
Figure 1 HLHO-10-C score for each item.

Results

Construction of HLHO in Beijing

As shown in Figure 1, the respondents rated most of the ten HLHO-10-C items as 6 or higher. Among the ten items in the questionnaire, the top three items with the highest percentage of ratings of 6 or less were HLHO4, HLHO3, and HLHO1. The item with the highest percentage of ratings of 1 was HLHO4 and the item with the highest percentage of ratings of 7 was HLHO9.

Overall, healthcare workers in the surveyed organizations scored 6.170±1.056 for HLHO-10-C, with tertiary hospitals' scores being lower than those of secondary hospitals and PHCs. For each item, the higher scores were for items 9 and 6, and the lower ones were for items 4 and 3. Higher scores were obtained for items 9 and 8 in tertiary hospitals, higher scores were obtained for items 9 and 10 in secondary hospitals, and lower scores were obtained for items 4 and 3 in both tertiary and secondary hospitals, as shown in Table 1.

Table 1 HLHO-10 Scores for Sample Healthcare Organizations ($\bar{x} \pm SD$)

No.	Items	Overall	Tertiary hospitals	Secondary hospital	Community Health Centers
HLHO1	Is the management at your hospital explicitly dedicated to the subject of health literacy (eg, mission statement, human resources planning)?	6.105±1.270	5.905±1.407	6.262±0.951	6.416±1.015
HLHO2	Is the topic of health literacy considered in quality management measures at your hospital?	6.106±1.252	5.921±1.378	6.311±0.913	6.372±1.044
HLHO3	Is health information at your hospital developed by involving patients?	5.928±1.409	5.704±1.546	6.136±1.090	6.263±1.149
HLHO4	Is individualized health information used at your hospital (eg, different languages, print sizes, braille)?	5.781±1.550	5.612±1.636	5.752±1.431	6.108±1.369
HLHO5	Are there communication standards at your hospital which ensure that patients truly understand the necessary information (eg, translators, allowing pauses for reflection, calling for further queries)?	6.197±1.169	6.037±1.285	6.358±0.858	6.435±0.986
HLHO6	Are efforts made to ensure that patients can find their way at your hospital without any problems (eg, direction signs, information staff)?	6.370±1.040	6.229±1.150	6.540±0.722	6.568±0.874
HLHO7	Is information made available to different patients via different media at your hospital (eg, three-dimensional models, DVDs, picture stories)?	6.211±1.165	6.056±1.278	6.341±0.878	6.449±0.981
HLHO8	Is it ensured that the patients have truly understood everything, particularly in critical situations (eg, medication, surgical consent), at your hospital?	6.343±1.061	6.232±1.160	6.483±0.793	6.497±0.924
HLHO9	Do you communicate openly and comprehensibly at your hospital to your patients in advance about the costs which they themselves have to pay for treatment (eg, out-of-pocket payments)?	6.397±1.024	6.277±1.118	6.553±0.787	6.561±0.883
HLHO10	Are employees at your hospital trained on the topic of health literacy?	6.256±1.162	6.055±1.301	6.550±0.771	6.516±0.911
	HLHO-10-C score	6.170±1.056	6.003±1.167	6.328±0.747	6.418±0.864

In terms of the dimensions of the HLHO-10-C, healthcare institutions scored relatively high (6.284±1.034) in the area of support for institutional environment-building. In terms of the scores of different levels of healthcare organizations, the PHCs scored higher in all dimensions, and there was a statistical difference in the scores of different levels of organizations in all dimensions ($P<0.001$), as shown in Table 2.

Univariate Analysis of Characteristics of Respondents and HLHO-10-C Scores

In terms of the basic characteristics of the respondents, the majority of the respondents were female (87.6%), their age was mainly concentrated between 31 and 50 years (64.2%), and about two-thirds of the respondents had a bachelor's degree. Regarding work-related characteristics, only 84 respondents had no professional or technical titles, more than half (64.1%) had more than 10 years of work experience, and 69.3% had official budgeted posts. More than half of the personnel indicated that they had carried out outpatient health education work or inpatient health education work. Please see Table 3.

As shown in Table 3, the results of the univariate analysis of HLHO-10-C scores showed that the differences in HLHO-10-C scores among respondents of different ages, educational levels, monthly personal income, titles, working years, major, departments, levels of healthcare institutions, and whether they carried out health education work were all statistically significant ($P<0.001$). Specifically, participants with higher levels of health care institutions had relatively

Table 2 Scores on Different Dimensions of HLHO-10-C

Dimension	Overall	Tertiary Hospitals	Secondary Hospital	Community Health Centers	χ^2	P
Leadership support	6.156±1.164	5.961±1.295	6.374±0.821	6.435±0.924	82.412	<0.001
Staff support	6.132±1.075	5.976±1.178	6.253±0.805	6.376±0.904	66.493	<0.001
Environmental support	6.284±1.034	6.133±1.143	6.449±0.730	6.501±0.856	67.665	<0.001

Table 3 Univariate Analysis of Respondents' Basic Characteristics and HLHO-10-C Questionnaire Scores

Characteristics	n	%	Mean	SD	χ^2	P
Gender					−1.184	0.237
Male	313	12.4	6.132	1.016		
Female	2214	87.6	6.175	1.061		
Age(years)					28.425	<0.001
≤30	640	25.3	6.319	0.983		
31 ~40	1091	43.2	6.112	1.092		
41–50	530	21.0	6.088	1.043		
>50	266	10.5	6.209	1.065		
Education level					59.307	<0.001
Associate degree or below	504	19.9	6.326	1.047		
Bachelor degree	1640	64.9	6.184	1.039		
Graduate degree	383	15.2	5.901	1.089		
Marital status					4.368	0.113
Single	458	18.1	6.204	1.043		
Married	1964	77.7	6.172	1.054		
Others[a]	105	4.2	5.977	1.130		
Monthly personal income (Yuan[b])					17.577	<0.001
≤10,000	1408	55.7	6.227	1.045		
10,001–15,000	850	33.6	6.109	1.078		
>15,000	269	10.6	6.058	1.024		

(*Continued*)

Table 3 (Continued).

Characteristics	*n*	%	Mean	SD	χ^2	*P*
Titles					50.384	<0.001
None	84	3.3	6.443	0.980		
Junior	997	39.5	6.281	1.000		
Mediocre	1123	44.4	6.104	1.104		
Assistant senior and above	323	12.8	5.983	1.025		
Levels of healthcare institutions					73.454	<0.001
Tertiary	1448	57.3	6.003	1.167		
Secondary	302	12.0	6.328	0.747		
Primary	777	30.7	6.418	0.864		
Working years					13.303	0.021
≤5	381	15.1	6.248	1.003		
6–10	526	20.8	6.246	1.056		
11–15	598	23.7	6.130	1.054		
16–20	361	14.3	6.145	1.081		
21–25	230	9.1	6.043	1.060		
>25	431	17.1	6.149	1.073		
Officially budgeted posts					1.692	0.091
Yes	1751	69.3	6.162	1.038		
No	776	30.7	6.188	1.094		
Major					26.883	<0.001
Clinical	598	23.7	6.028	1.068		
Nursing	1498	59.3	6.168	1.087		
Others	431	17.1	6.369	0.882		
Department					80.241	<0.001
Surgical	422	16.7	6.222	1.013		
Internal	832	32.9	5.877	1.218		
Others	1273	50.4	6.344	0.904		
Health education for outpatients					−6.859	<0.001
Yes	1333	52.8	6.304	0.962		
No	1194	47.2	6.020	1.133		
Health education for inpatients					−2.030	0.043
Yes	1335	52.8	6.226	0.993		
No	1192	47.2	6.106	1.119		

Notes: [a]Other marital statuses include divorced, widowed, cohabitation, and remarriage. [b]10,000 Chinese Yuan≈1476 US dollars in 2023.

lower scores (*P*<0.001), and those who conducted outpatient or inpatient health education had higher scores than those who did not (*P*<0.001).

Regression Analysis of HLHO-10-C Scores

The variance inflation factor (VIF) of each variable was less than 10, which indicating that there was no multicollinearity among the independent variables. The GLM was developed using the HLHO-10-C score as the dependent variable, and the basic characteristics of the survey respondents as the independent variables. The results of the analysis showed that statistically significant factors included education level, level of the healthcare organization and department, whether outpatient health education was conducted, and whether inpatient health education was conducted. Please see Table 4.

Discussion

The HLHO-10-C questionnaire was used to survey medical staff across different levels of healthcare institutions in Beijing to understand the status of HLHO construction and identify issues. These findings could provide a basis for

Table 4 Results of Generalized Linear Model Regression Results for HLHO-10-C Scores

Variables	β	SE	Z	P	95% CI	
Gender (Reference: Male)						
Female	0.060	0.067	0.900	0.370	−0.071	0.192
Age(years) (Reference: ≤30)						
31 ~40	−0.119	0.080	−1.490	0.137	−0.276	0.038
41–50	−0.072	0.122	−0.590	0.555	−0.310	0.166
>50	0.062	0.156	0.400	0.690	−0.243	0.367
Education level (Reference: Associate degree or below)						
Bachelor's degree	−0.065	0.056	−1.160	0.246	−0.174	0.045
Graduate degree	−0.341	0.091	−3.730	0.000	−0.520	−0.162
Marital status (Reference: Single)						
Married	0.092	0.066	1.390	0.164	−0.037	0.221
Others[a]	−0.030	0.118	−0.250	0.800	−0.261	0.202
Monthly personal income (Yuan[b]) (Reference: ≤10,000)						
10,001~15,000	0.093	0.049	1.900	0.057	−0.003	0.188
>15,000	0.146	0.075	1.950	0.052	−0.001	0.294
Titles (Reference: None)						
Junior	−0.044	0.118	−0.370	0.711	−0.274	0.187
Mediocre	−0.135	0.128	−1.050	0.293	−0.386	0.116
Assistant senior and above	−0.222	0.148	−1.510	0.132	−0.512	0.067
Levels of healthcare institutions (Reference: Tertiary)						
Secondary	0.274	0.069	3.960	<0.001	0.138	0.409
Primary	0.358	0.072	5.000	<0.001	0.218	0.498
Work years (Reference: ≤5)						
6–10	−0.037	0.078	−0.470	0.636	−0.191	0.117
11–15	−0.113	0.101	−1.120	0.264	−0.312	0.085
16–20	−0.144	0.116	−1.240	0.214	−0.372	0.083
21–25	−0.288	0.145	−1.990	0.047	−0.573	−0.004
>25	−0.298	0.154	−1.930	0.053	−0.601	0.004
Officially budgeted posts (Reference: Yes)						
No	−0.081	0.049	−1.640	0.102	−0.177	0.016
Major (Reference: Clinical)						
Nursing	0.020	0.067	0.300	0.763	−0.110	0.151
Others	0.022	0.076	0.290	0.768	−0.127	0.172
Department (Reference: Surgical)						
Internal	−0.334	0.061	−5.490	<0.001	−0.453	−0.214
Others	0.009	0.068	0.130	0.893	−0.125	0.143
Health education for outpatients (Reference: Yes)						
No	−0.189	0.044	−4.300	<0.001	−0.275	−0.103
Health education for inpatients (Reference: Yes)						
No	−0.284	0.046	−6.160	<0.001	−0.375	−0.194

Notes: [a]Other marital statuses include divorced, widowed, cohabitation, and remarriage. [b]10,000 Chinese Yuan≈1476 US dollars in 2023.

promoting the construction of HLHO, which is important for improving patients' experience and satisfaction with medical care.

This study revealed that PHCs had the highest HLHO-10-C scores, followed by secondary hospitals, while tertiary hospitals had the lowest scores. This may be related to the differences in the functions of healthcare institutions at different levels. PHCs mainly provide basic public health services and carry out more health promotion and health education work. Upon the analysis of each item, item 9 (regarding communication with patients about medical costs) scored the highest, which may be due to the payment model of "pay first, diagnose, and treat later" in China's healthcare institutions. Item 6 (related to setting up directional signs and arranging guides) scored higher, possibly reflecting China's

emphasis on the design and implementation of hospital guide signs. Beijing issued the "Guide to the Design of Guide Signs for Beijing Municipal Hospitals" in 2014, and with the digitization and intelligent construction of the healthcare industry, the smart hospital signage system has been introduced into healthcare institutions, and healthcare institutions are paying more attention to providing guide services for patients. In contrast, items 3 and 4 scored lower, indicating the insufficient patient involvement in developing health education information in medical institutions Additionally, the provided health information tends to favour the general public, neglecting the needs of special groups (including the elderly, the disabled, and people with low health literacy). Item 9 had the highest score for all three types of healthcare organizations. Notably, tertiary hospitals scored higher on item 8, which reflected the communication of key information with patients. Secondary hospitals scored higher on item 10, reflecting better health literacy training for medical staff. PHCs scored higher on item 6, demonstrating the availability of medical guidance equipment and services. This may be related to that tertiary hospitals in Beijing carry out more diagnostic and treatment activities (medication, surgery, etc)., and secondary hospitals are gradually transforming into rehabilitation and other specialty hospitals, which require more service and health literacy from medical staff. PHCs are more concerned with improving their equipment and facilities. The results of the scores across the three dimensions of leadership support, staff support, and support for environmental construction reflect that medical institutions at all levels in Beijing have the highest scores in environmental construction support, which may be associated with Beijing's higher economic level and increased investment in health resources.

Comparing the results of the HLHO-10-C scores of the 24 medical institutions at all levels in Hangzhou,[11] the higher scores were for items 6 (related to setting up directional signs and arranging guides) and 9 (regarding communication with patients about medical costs), while the lowest scores were for items 3 (about patient participation in health information development) and 4 (Usage of personalized health information), which is consistent with the results of this study. However, the scores of Hangzhou Medical Institutions for each item and the overall score were lower than those in this study, indicating a better construction of the HLHO in Beijing. When comparing the results of this study with a study of HLHO in the Tuscany region of Italy,[15] it was found that the HLHO-10 scores in this study were higher, indicating that health literacy-promoting institutions at all levels of healthcare in Beijing are in better condition. Private hospitals in the Tuscany region of Italy had the highest scores for the use of personalized health information for the fourth entry of the HLHO, which contrasts with the results obtained in this study and is considered to be related to the type of healthcare institution and variations in healthcare systems across regions.

Regarding the factors influencing HLHO-10-C scores, it was found that there were differences in scores by educational level, with graduate-level scores being lower than undergraduate-level scores. This is similar to the findings of a foreign study[16] and maybe because those with higher degrees tend to be more aware of health literacy building in their organizations and can participate in related strategic planning and composition development. In addition, doctors in Chinese healthcare organizations generally have higher degrees than other personnel. They score lower may because they are more concerned with diagnosis and treatment and have a larger workload than nurses or medical technicians. They were unable to adequately conduct health education activities for their patients.[17] Second, the study revealed that among the different levels of healthcare organizations, the scores of secondary hospitals were higher than those of tertiary hospitals. This may be due to the transformation of secondary hospitals into rehabilitation hospitals and nursing homes.[18] The transformation of their institutional functions is more conducive to the development of health education activities, and specialty hospitals are more focused on service quality improvement and branding, resulting in higher HLHO scores. Third, the study identified differences in scores among different department types, with internal medicine staff scoring the lowest on the HLHO. This is likely because internal medical diseases are treated with medication and have a longer course of illness, requiring patients to participate in the self-management of their health. Therefore, the internal medicine staff engaged in more health education work and had higher expectations and requirements for HLHO. Fourth, the study observed that medical staff who carried out outpatient or inpatient health education work had higher ratings than those who did not participate in related work. This may be attributed to their involvement in frontline health education work and being more supportive of the popularization of health activities carried out by the institution. Considering that digital tools and platforms could significantly enhance health literacy and support the development of health-literate healthcare organizations, it is imperative to improve the access to personalized health information through patient portals and mobile apps, facilitate

better communication via telemedicine and AI-powered tools, and provide tailored health education through e-learning platforms and interactive content.

This study still has some limitations, as it currently only assesses the construction status of HLHO from the perspective of medical staff and lacks evaluation from the viewpoint of patients. In the future, a comprehensive analysis could be conducted by integrating patient' satisfaction, patient' health literacy level, and the health literacy evaluation of medical staff to explore the relationship between the construction of HLHO and the improvement of patients' health literacy and satisfaction in China.

Conclusion

Overall, the construction of health literacy-oriented healthcare institutions in Beijing is relatively good, with PHCs scoring the highest in HLHO-10-C. Various types of healthcare institutions perform well in building a supportive environment for health education, but need to strengthen employee support. In the future, targeted measures are required to encourage healthcare workers in tertiary hospitals to actively engage in health education activities, which could empower patients to better understand and manage their conditions, leading to improved health outcomes, ultimately contributing to healthier communities. Additionally, since this study only investigated the medical staff's HLHO-10-C scores and lacked data from the patient's perspective, further study should integrate data from multiple perspectives to provide more comprehensive and meaningful suggestions for supporting the construction of health literacy medical institutions.

Data Sharing Statement

The data supporting the findings of this study are available at *4TU. Research Data* at http://doi.org/10.4121/565e4c8d-f547-4ab0-b2b8-177d72fee5c9.

Ethical Approval

This study has been approved by the Medical Ethics Committee of Capital Medical University (Z2022SY018). All methods were performed in accordance with the relevant guidelines and regulations, and informed consent was obtained from the study subjects before the investigation.

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Disclosure

The author(s) report no conflicts of interest in this work.

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