



Home-Based Medical Care Service Motivation Among Medical Staff in Beijing, China: the Role of Institutional Support

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Background: Home-based medical care services (HMCS) play a crucial role in China's response to an aging population. Given the scarcity of quantitative research on motivating medical staff in relevant institutions, this study aimed to explore the impact of institutional support on motivating the provision of HMCS.

Methods: The medical staff involved in this study originated from seven community health service centers in Beijing. We utilized a self-designed questionnaire to conduct the survey, gathering socioeconomic information, institutional support for service delivery, as well as the frequency and types of services the respondents provided. Statistical analysis involved the one-way tests and multivariate regressions, and structural equation modeling (SEM) was employed to enhance the results obtained from the regression analysis.

Results: A total of 673 valid questionnaires were considered, with 66.12% of respondents indicating their involvement in offering HMCS services and 51.86% reporting the provision of home-based treatment and care services. Upon adjusting for all covariates, multiple regression results highlighted that the establishment of a clear service pathway significantly influenced the motivation to provide services. Furthermore, the results obtained from SEM validated the findings derived from the regression analysis.

Conclusion: Standardized institutional support is an essential means of bolstering the motivation of medical staff to provide HMCS and deserves heightened attention from health administrators.

Keywords: home-based medical care services, motivation, medical staff, institutional support

Introduction

Population of China is undergoing an ongoing and intensified aging process. The seventh national population census indicates that the elderly population aged over 60 years has reached 264 million, representing close to 20% of the total population,¹ and prediction suggests that by 2035, the per capita life expectancy will reach 81.3 years.² In the past, elderly care in China relied mainly on informal care provided by family members due to filial piety.³ However, in recent years, factors such as the declining fertility due to the long-term implementation of the family planning policy have weakened families' capacity to provide care.^{4,5} Consequently, there is an urgent need to develop socialized care services for the elderly and establish a new type of elderly care system. "Aging in place" is generally welcomed by older people, and show an advantage that allows elderly adults to be cared in their familiar places.⁶ In 2019, China continued to enhance the policy of integrating medical and nursing care, emphasizing the importance of home-based medical care services (HMCS) in addressing the challenges posed by aging.^{7,8} Unlike other pension methods that necessitate leaving the familiar living environment, HMCS enable older adults to realize their desire to stay within their community and family.⁹ These policies are in line with the World Health Organization's recommendation to enhance the intrinsic capacity of older people within their communities.¹⁰

The beneficial health outcomes of implementing HMCS have been confirmed by numerous studies. Reported by a cohort study in Canada, elderly patients receiving more frequent HMCS from physicians tend to have lower rates of

emergency visits and hospitalizations compared with patients whose physician did not offer HMCS.¹¹ Comparatively, follow-up findings from Japan demonstrated that older adults receiving physician-led home medical care experienced reduced mortality rates.¹² For frail older people, HMCS have been evaluated as effective therapy helping improve daily living activities in a previous systematic review.¹³ While acknowledging the advantages of HMCS, there remain gaps in the implementation of current services. Cross-sectional research conducted in Hunan province, China, indicated that approximately 80% of the elderly were willing to receive HMCS.¹⁴ However, in a qualitative research, family members reported that elderly individuals in their households were unable to access HMCS from community health centers promptly due to a shortage of home care medical staff within these institutions.¹⁵ And the high turnover rate of home care professionals may contribute to the shortage of manpower for delivering HMCS.¹⁶ Thus, further study is needed to understand how to ensure the motivation of medical personnel engaged in providing HMCS.

There has been extensive exploration into the factors that influence the motivation of HMCS before—compensation and benefits, professional development support, and workload management are interconnected facilitators in this regard.¹⁷ Similar to prior findings in Zhang et al's qualitative study with home-based palliative care nurses in Shandong, China,¹⁸ most of these factors can be attributed to the institutional level. Lack of career development opportunities and inadequate benefits were what nurses complain about.¹⁸ Nurses are the main providers of HMCS. And a study conducted in Taiwan also illustrated that support from institutions encourages nurses to opt for implementing home-based palliative care services.¹⁹ These studies imply that support from hosting institutions is advantageous for the advancement of HMCS. However, further elucidation is required to discern the specific aspects of support that effectively foster the participation of medical staff in these services.

In urban areas of China, HMCS are mainly provided by community health service institutions.²⁰ Beijing, one of the most aging mega-cities in China,² implemented a policy aimed at enhancing the execution of HMCS through community health service institutions. This policy mandates these institutions to offer training, standardize processes, risk management, and provide other forms of support for HMCS staff.²¹ However, there exists significant heterogeneity in the level of support across different institutions. Additionally, most of previous studies are qualitative in nature, lacking quantitative evidence. Hence, our intention is to conduct a questionnaire survey in Beijing to quantitatively explore the relationship between institutional support and the motivation of primary care medical staff to engage in HMCS services. This study aims to offer theoretical references for optimizing policies in this domain.

Methods

Study Design and Participants

A cross-sectional online survey was conducted to determine the prevalence of HMCS provided by medical staff and relative factors in Beijing, China. Participants could fill out the questionnaire by scanning a QR code on WeChat platform. We used a convenient sampling method to recruit respondents. The calculation formula and process are as formula 1:

$$n = \frac{\mu_{\alpha}^2 p(1-p)}{\delta^2} = \frac{1.96^2 \times 0.691 \times 0.309}{0.05^2} \approx 328 \quad (1)$$

The HMCS provided prevalence in the previous investigation in other country was 69.1%.¹¹ $\delta = \pm 5\%$, $\alpha = 0.05$, $\mu_{\alpha} = 1.96$. Considering the proportion of invalid questionnaires, the estimated sample size should be increased by 20% according to the calculation. Therefore, at least 394 participants need to be surveyed.

The sampling procedure included two steps. First, we selected five districts—Xicheng, Haidian, Chaoyang, Tongzhou, and Fangshan. The government has divided Beijing into four main functional zones, with districts within each zone undertaking similar development goals and tasks.²² However, there are significant disparities in healthcare resources and levels among these functional zones. Based on this, the five districts we chose belong to different functional zones, respectively. Within these five districts, we selected 8 community health service centers. Second, employees worked within these eight community health service centers were selected as the respondents for this study. We fully communicated with the heads of the local community health service centers, ensuring they understood the survey's purpose and sought their cooperation. Coordinators of each center received training on survey precautions and

standardizing survey specifications. They then distributed electronic questionnaires accordingly. Each center was required to complete more than 50 questionnaires, based on the calculated sample size. More details were showed in [Table S1](#). Inclusion criteria were as follows: (1) Individuals who willingly participated in the study, (2) who used smartphones and WeChat application, and (3) who worked in the specific 8 community health service institutions in Beijing. Conversely, the exclusion criteria comprised individuals who did not complete the questionnaire, refused to participate, and employees whose roles did not involve HMCS. Data was collected in June 2023, and informed consents were obtained from all subjects before the investigation. Ultimately, 194 invalid questionnaires were removed based on these criteria, and 673 valid questionnaires were collected and analyzed.

HMCS Motivation Assessment

There is no criteria for determining motivation to implement, thus we assessed the medical staff's inclination to perform HMCS at their workplace using self-designed questions. The first question, "Have you previously provided home-based medical care services?" was designed to ascertain the prevalence of HMCS delivery. The second question, "How many times in the past month have you provided home-based medical care service?" aimed to gauge the frequency of service within a one-month period. The third question, "What are the types of home-based medical care service you have provided?" was crafted to articulate the diversity in service programs offered.

Institutional Support

To evaluate institutional support, we formulated four items. The identification of the four questionnaire items was based on a review of recent national and Beijing-specific home-based care policy documents.^{21,23,24} Expert consultation was conducted before distributing the questionnaire to ensure its content was reasonable. Respondents were requested to score each item on a scale of 1 to 7, with 1 being the minimum score. Higher scores indicate greater alignment of the institution with the characteristic of the respective item. Detailed description of each item is outlined below:

IS-1: The institution can consistently arrange training related to HMCS; IS-2: The institution possesses a detailed and clear incentive system for HMCS remuneration and performance; IS-3: The institution maintains a detailed and clear pathway for implementing HMCS; IS-4: The institution adheres to detailed and clear safety regulations for HMCS.

Covariates

The covariates primarily comprised socio-economic information of the respondents, which included: gender (0 = male, 1 = female), position (0 = regular staff, 1 = unregular staff), marital status (0 = married, 1 = other), age (1 = 35 years and below, 2 = 36 to 45 years, 3 = higher than 45 years), occupation type (1 = clinic physician, 2 = clinical Chinese physician, 3 = preventive health practitioner, 4 = nurse, 5 = general practitioner, 6 = other), education level (1 = college and below, 2 = undergraduate, 3 = graduate), monthly income (1 = lower than 5000 RMB, 2 = 5000 to 10,000, 3 = higher than 10,000), job title (1 = primary, 2 = middle, 3 = high), and working experience (1 = 10 years and below, 2 = 11 to 20 years, 3 = higher than 20 years).

Statistical Analysis

The data we collected were imported into R statistical software (version 4.2.1) for processing and analysis. All categorical characteristics were described using frequencies (n) and proportion (%). The quantitative variables (IS-1, IS-2, IS-3, and IS-4) obtained from the questionnaires were described using median and interquartile range. Tests of structural validity were conducted prior to formal analysis to ensure that the four items collectively reflect the dimension of institutional support. Bartlett's test of sphericity and factor analysis were employed. In the univariate analyses, Chi-square tests were employed to compare demographic information between two respondent groups: those who have never provided services and those who have provided services previously. Non-parametric tests (the Mann-Whitney *U*-test or the Kruskal-Wallis test) were employed to explore for diversity in quantitative variables between different groups. In the multivariate analyses, multiple stepwise regression was constructed to control the confounding bias, which adjusted for covariate and reported odds ratios (ORs) and confidence intervals (CIs). For a binary outcome variable, the Logistic regression method was employed, whereas for a count outcome variable, the Poisson regression method was utilized. Structural equation modeling (SEM) was constructed based on the study context and the investigated variables to merge

multiple different outcomes. The indices to assess goodness of model fit included: the ratio of chi-square test statistic and degree of freedom (χ^2/df) lower than 5, comparative fit index (CFI) higher than 0.95, root mean square error of approximation (RMSEA) lower than 0.1, and standardized root mean square residual (SRMR) lower than 0.1. The significant difference was considered for two-tailed $p < 0.05$.

Results

Structural Validity of the Self-Designed Institutional Support Questionnaire

Bartlett’s test of sphericity yielded a significant result ($\chi^2= 25.121, p<0.001$), indicating a strong correlation between the four items without redundancy. Eigenvalues and loadings are presented in [Table S2](#). One factor was extracted with an eigenvalue of 3.28, which explained about 82% of the variance. The first factor showed a strong correlation with all four items (standardized loadings>0.8).

Characteristics of the Respondents

A descriptive summary of the respondents’ socio-demographic characteristics is presented in [Table 1](#). Among all 673 respondents, over 88% were women and 80% were married. Around three out of five respondents had undergraduate

Table 1 Socio-Demographic Information on Respondents Who Have Never Provided HMCS versus Those Who Have Provided (n, %)

Characteristics	Overall	Never provided	Have provided	p-value*
n	673	228	445	
Gender, female	593 (88.1)	190 (83.3)	403 (90.6)	0.009
Position, unregular staff	223 (33.1)	89 (39.0)	134 (30.1)	0.025
Age (year)				0.500
~35	283 (42.1)	100 (43.9)	183 (41.1)	
36–45	252 (37.4)	87 (38.2)	165 (37.1)	
>45	138 (20.5)	41 (18.0)	97 (21.8)	
Marital state, other	115 (17.1)	46 (20.2)	69 (15.5)	0.157
Occupation type				<0.001
Clinic physician	69 (10.3)	20 (8.8)	49 (11.0)	
Chinese medicine practitioner	83 (12.3)	36 (15.8)	47 (10.6)	
Preventive health practitioner	63 (9.4)	25 (11.0)	38 (8.5)	
Nurse	289 (42.9)	75 (32.9)	214 (48.1)	
General practitioner	94 (14.0)	27 (11.8)	67 (15.1)	
Other	75 (11.1)	45 (19.7)	30 (6.7)	
Education level				0.844
College and below	171 (25.4)	61 (26.8)	110 (24.7)	
Undergraduate	410 (60.9)	136 (59.6)	274 (61.6)	
Graduate	92 (13.7)	31 (13.6)	61 (13.7)	
Monthly income (RMB)				0.896
<5000	170 (25.3)	60 (26.3)	110 (24.7)	
5000~10,000	373 (55.4)	124 (54.4)	249 (56.0)	
10,001~	130 (19.3)	44 (19.3)	86 (19.3)	
Title				0.010
Primary	296 (44.0)	118 (51.8)	178 (40.0)	
Middle	298 (44.3)	90 (39.5)	208 (46.7)	
High	79 (11.7)	20 (8.8)	59 (13.3)	
Working experience (year)				0.023
~10	228 (33.9)	93 (40.8)	135 (30.3)	
11~20	254 (37.7)	75 (32.9)	179 (40.2)	
>20	191 (28.4)	60 (26.3)	131 (29.4)	

Note: *The statistical differences were evaluated using the Chi-square test.

education level. More over one-half of respondents earned between 5000 and 10,000 RMB per month. Close to 90% of respondents had a primary or middle title. Nurses were nearly half of the respondents who had provided HMCS, followed by general practitioners (15.1%). The results of the univariate analysis showed that gender, position, type of occupation, job title, and years of working experience were significantly associated with the provision of HMCS.

The percentage of respondents who have provided HMCS was 66.12%. Notably, 47% indicated a lack of activity in providing HMCS within the past month, while fewer than 10% reported delivering HMCS more than five times during the same period. Among medical staff in community health service institutions, a majority (51.86%) indicated involvement in providing home-based treatment or nursing care to patients. Conversely, the delivery of home-based rehabilitation services (22.14%) and palliative care (22.44%) by medical staff was less prevalent. Furthermore, a substantial portion of respondents engaged in HMCS reported offering only one or two specific services to their patients, accounting for 19% and 17%, respectively (Table 2).

The univariate analyses examining the relationship between institutional support and the motivation to provide HMCS are showed in Table S3. We calculated the Cronbach's alpha of 0.94 for the set of four items. A potential correlation was observed between IS-3 and staff engagement in delivering HMCS ($p = 0.053$). Noteworthy was the statistically significant association ($p = 0.016$) discovered in relation to the reported frequency of service provision. Additionally, a statistically significant relationship was established between IS-2 and the frequency of HMCS delivery ($p = 0.046$). However, it is imperative to underscore that while institutional support displayed influences, it did not yield statistically significant impact on the types of services provided by medical staff (all $p > 0.05$).

Multivariate Analysis

The results of the multivariate analysis of the factors related to the influence of the motivation of medical staff to engage in HMCS delivery are displayed in Figure 1. After adjusting for socio-demographic variables, the variable IS-3 was significantly and positively associated with whether or not respondents provided HMCS, the frequency of services, and

Table 2 Motivation to Provide HMCS by Medical Staffs of Community Health Service Institutions (n, %)

Questions	Number	Proportion
1. Have you provided home-based medical care service in the past?		
0 = No	228	33.88
1 = Yes	445	66.12
2. How many times in the past month have you provided home-based medical care service?		
0	318	47.25
1	118	17.53
2	114	16.94
3-5	68	10.10
>5	55	8.17
3.1. What are the types of home-based medical care service you have provided?		
Home-based treatment or nursing care	349	51.86
Home-based rehabilitation services for discharged patients	149	22.14
Palliative care for people with severe functional disabilities	151	22.44
Home-based health education or guidance	260	38.63
Home-based medical examination and other services	263	39.08
3.2. How many types of home-based medical care services have a staff provided?*		
0	228	33.88
1	127	18.87
2	116	17.24
3	74	11.00
4	49	7.28
5	79	11.74

Notes: *Question 3.2 was not in the questionnaire, but was obtained by combining the results of question 3.1.

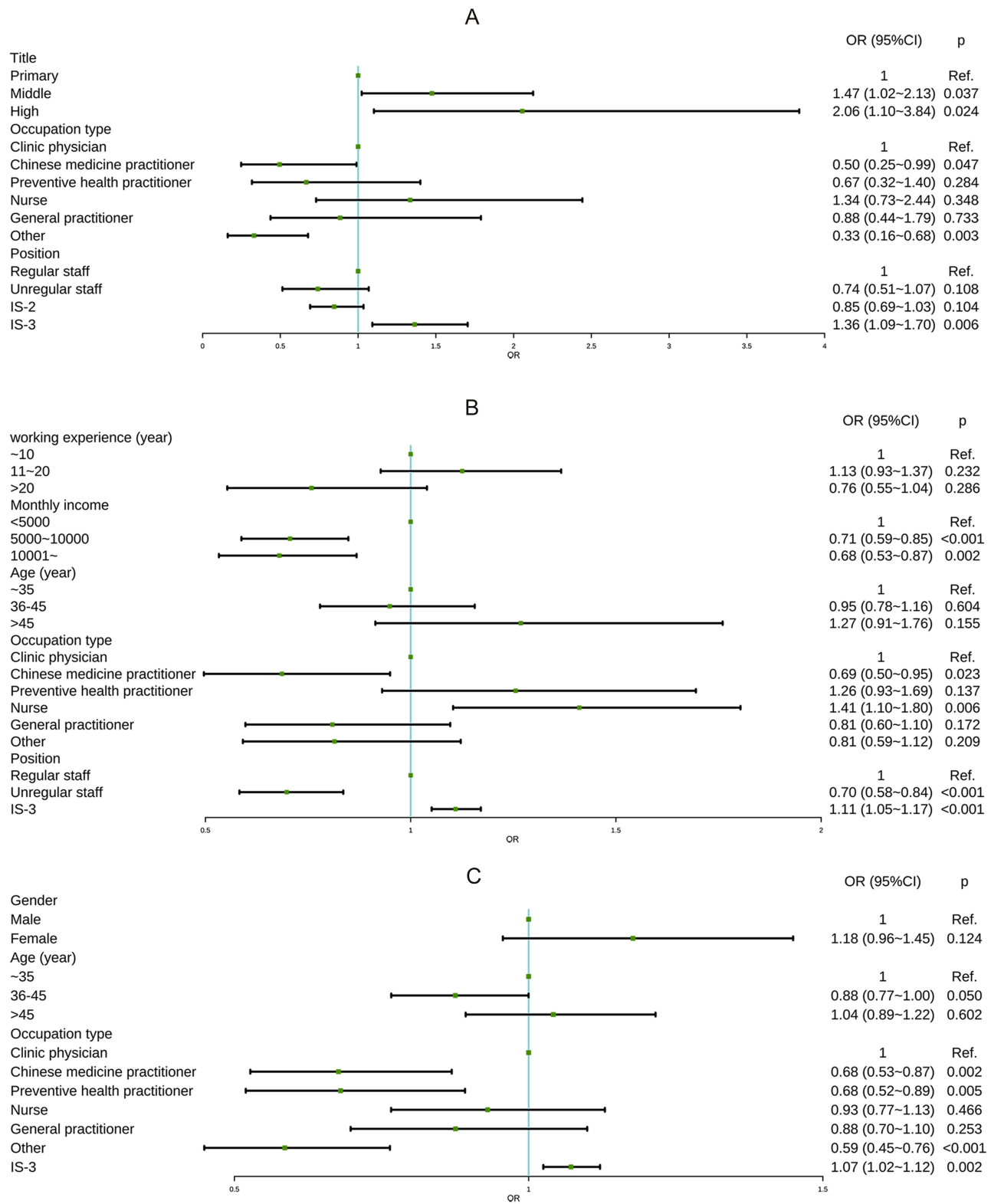


Figure 1 Multivariate analysis of potential factors influencing the motivation of respondents to implement HMCS (N = 673). The analysis examines three dependent variables: **(A)** provision of HMCS (question 1), **(B)** frequency of HMCS (question 2), and **(C)** types of HMCS provided (question 3.2). Model **(A)** was constructed by binary logistic regression. Model **(B)** and **(C)** were constructed by Poisson regression.

type of services (OR = 1.36; $p = 0.006$, OR = 1.11; $p < 0.001$, and OR = 1.07; $p = 0.002$, respectively). The respondents' occupation significantly influenced their service delivery, with Chinese medicine practitioner being less motivated than clinic physician (OR: 0.50; $p = 0.047$, OR: 0.69; $p = 0.023$, and OR: 0.68; $p = 0.002$, respectively). Additionally, nurse provided services more frequently than clinic physician (OR: 1.41, CI: 1.10~1.80, $p = 0.006$).

Structural Equation Model

A structural equation model was used to supplement the multivariate regression analysis. The estimates for the fit indices suggested an acceptable final model fit: $\chi^2/df = 3.174$, CFI=0.978, RMSEA= 0.057, SRMR=0.039.

Institutional support was explained by IS-1 ($\beta = 0.85$, as reference), IS-2 ($\beta = 0.82$, $p < 0.001$), IS-3 ($\beta = 0.97$, $p < 0.001$), and IS-4 ($\beta = 0.94$, $p < 0.001$). Personal socio-economic status was explained by monthly income ($\beta = 0.75$, as reference), education level ($\beta = 0.48$, $p < 0.001$), position ($\beta = 0.65$, $p < 0.001$), and job title ($\beta = 0.46$, $p < 0.001$). HMCS motivation was explained by service ever provided or not ($\beta = 0.89$, as reference), frequency of service delivery ($\beta = 0.64$, $p < 0.001$), and types of service delivery ($\beta = 0.82$, $p < 0.001$). Institutional support had a significant association with HMCS motivation ($\beta = 0.10$, $p = 0.024$), whereas personal socio-economic status was not directly associated with HMCS motivation ($\beta = 0.02$, $p = 0.656$). The results of the structural equation model are shown in Figure 2.

Discussion

According to Jones et al's survey of primary care physicians in Canada, 69.1% of them conducted at least one home visit during the year, a finding that aligns quite closely with the result (66.12%) obtained from our sample analysis.¹¹ Nonetheless, majority of respondents in our study indicated providing HMCS less frequently, implying a persisting challenge in finding effective methods to enhance motivation for service provision. A survey study by Jeong et al showed

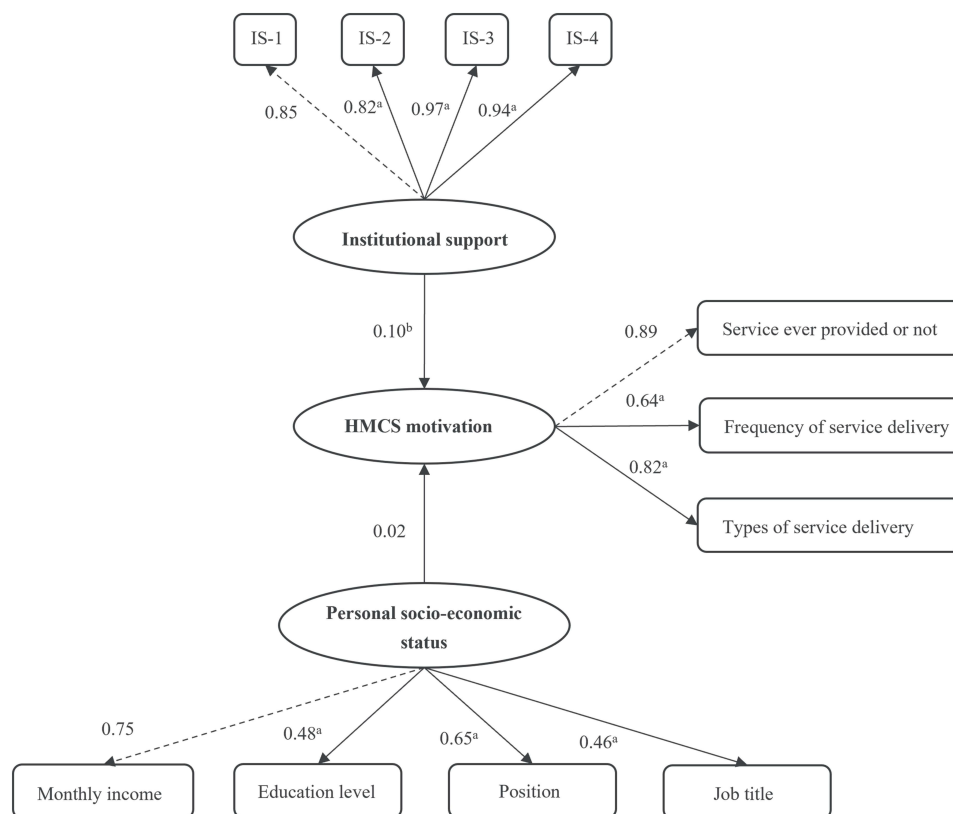


Figure 2 The structural model of the relationship between institution support, personal socio-economic status, and HMCS motivation in medical staff (N = 673). ^a $p < 0.01$. ^b $p < 0.05$. Standardized coefficients are reported. Observed variables are depicted as squares, latent variables as ovals. The observed variable pointed to by the dotted line is the reference. When constructing the SEM, "position" was encoded as 1 for "regular staff" and 0 for "unregular staff".

that more than 80% of Korean doctors considered HMCS to be very important, and most of them were willing to perform the service.²⁵ However, translation of medical staff's willingness into actual service delivery may be hindered by various additional factors. Our results did not reveal the significant impact of respondents' personal socio-economic status on their motivation for HMCS in our samples. Similarly, a previous study conducted in Germany have indicated that female and younger professionals are more inclined to offer services, while personal socio-economic characteristics were not significant in the results.²⁶ When factors at the level of the individual medical staff are not significant, working institutional support is more important to be emphasized.

In our study, institutional support in HMCS was interpreted as four items, including training arrangements, remuneration and performance incentives, service pathways, and safety regulations. In structural equation modeling, institutional support significantly and positively contributed to the motivation of medical staff to provide HMCS. When adjusting for other individual characteristic covariates, explicitly detailed and clear service pathways were the only one among the four items that significantly fostered motivation in HMCS.

Notably, the clear and detailed service pathway specified by the institution emerged as a potentially crucial factor influencing this motivation. Specific instructions on what to do, how to do it, and what not to do are critically important to medical staff. A qualitative study conducted in Shanghai revealed similar findings, with both managers and interviewed nurses pointing out the absence of standardized procedures and evaluation criteria in China, which could enhance their confidence in providing services.¹⁵ Previous review has summarized the competencies of nurses in home care, including "performance of nursing procedures".²⁷ And the successful implementation of these procedures is not solely the responsibility of the individual nurse but is intricately tied to the clear regulations established by the institution where they are employed. In response to this issue, Rusli et al have reported a quantitative result derived from personal interviews with 17 home care nurses highlights a strong imperative for bolstering support systems.²⁸ In practice, managers of community health service institutions should prioritize the needs of medical staff. Developing detailed and clear pathway regulations for HMCS could alleviate their worries, ultimately enhancing service motivation.

While a clear service pathway might be the most crucial form of institutional support, training arrangements, remuneration and performance incentives, and safety regulations should not be overlooked. Several cross-sectional studies have demonstrated that regular error management training significantly reduces the incidence of home-based nursing and medication-related errors, thereby contributing to enhanced patient safety.^{29,30} Also, Japanese scholars Morioka et al discovered a favored association between training opportunities and the number of nurses within the home-visit nursing agencies,³¹ thereby contributing to increased workforce staffing. Researchers Larsson et al identified a positive relationship between the self-efficacy of home care nurses and the secure work environment, as evidenced by their investigation earlier.³² Hence, it is essential to recognize these factors as important supportive measures in the regulations and rules boosting HMCS. In addition, it is noteworthy that the private lives of medical staff might remain an important factor,³³ albeit unassessed in our study. Haaland et al's study identified nurses who experienced tensions between their responsibilities in home care service work and their family life, including concerns related to spending time with family and childcare.³⁴ Previous study has also observed a correlation between moral distress and burnout among home care nurses, indicating that burnout scores tend to increase by 0.25 points for every 1-point rise in moral distress scores.³⁵ The institutions should not overlook the emotional dilemmas arising from challenging ethical decisions encountered by medical staff in home care. Providing effective social support is crucial to address and cope with their emotional needs.

Various types of professionals are expected to different roles in HMCS. Consistent with previous study, nurses play a major role in HMCS since they had a higher frequency of service compared to other professions.¹⁹ A longitudinal study conducted in South Korea by Kim et al revealed a significant reduction in unmet health care needs among disabled patients following medical care provided by medical doctors and Korean medical doctors.³⁶ However, in our analysis, we observed that the motivation for providing HMCS among Chinese medicine practitioners was notably weaker compared to that of clinical doctors. The reasons might be complex. Patients may be skeptical and prejudiced against Chinese medicine due to conflicts with Western medicine concepts and practices, and some treatments in Chinese medicine (eg, acupuncture) lack strong clinical evidence.³⁷ Further research is needed to explore the positioning of Chinese medicine within HMCS, considering its significant role as a complementary and alternative

medicine. For institutions, it is important to recognize that different medical staff may have varying roles in HMCS. Therefore, exploring methods to differentiate their scopes of work and provide tailored support is an area that needs further study.

Strength and Limitation

The study utilized a cross-sectional design, lacking chronological order between correlates and HMCS motivation associations, thereby limiting causal inferences. Respondents completed the questionnaire in a self-administered online format, potentially introducing a degree of survey bias.

Conclusion

At the theoretical level, after quantifying institutional support across four items: training arrangements, remuneration and performance incentives, service pathways, and safety regulations, it becomes evident that institutional support plays a crucial role in influencing medical staff to engage in HMCS. Among these items, a well-defined clear service pathway stands out as the most influential factor in enhancing medical staff's motivation to provide services. At the practical level, we suggest that policy makers should focus on strengthening the planning and management of service pathways to ensure that medical staff can carry out HMCS smoothly. Government departments and healthcare institutions should work closely together to formulate and implement relevant policies and measures to support medical staff. Such collaboration can help to overcome possible barriers in the service procedures and increase the motivation of medical staff.

Data Sharing Statement

Data are available upon reasonable request from the corresponding author.

Ethics Approval and Informed Consent

Research ethics approval was obtained from the Medical Ethics Committee of Capital Medical University (2023SY124). Informed consents were obtained from all subjects before the investigation.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

The authors declare that they have no competing interests.

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