

Postprint: Family Doctor Team Collaboration Level and Influencing Factors in Integrated Medical-Preventive Services

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Abstract

Background With the intensification of population aging and the rising burden of non-communicable diseases, traditional healthcare service models have struggled to meet people's health needs. Therefore, promoting integrated medical and preventive services has become key to improving residents' health levels. Family doctor teams, as the main implementers of integrated medical and preventive services, play a crucial role. However, the current lack of effective multidisciplinary collaboration within family doctor teams seriously hinders the effective implementation and delivery of integrated medical and preventive services. **Objective** To investigate the collaboration status of family doctor teams in integrated medical and preventive services in Shandong Province, explore its influencing factors, and provide references for further improving the family doctor contract system and integrated medical and preventive services. **Methods** In August 2023, a multi-stage stratified random sampling method was used. Based on geographical location and economic development level, Yantai, Weifang, and Liaocheng were selected from the eastern, central, and western regions of Shandong Province, respectively. In each prefecture-level city, one district and one county/county-level city were randomly selected as sample areas, and 481 family doctors were surveyed. Based on extensive literature review and consultation with relevant experts, a specialized questionnaire for primary care physicians was designed. The questionnaire consisted of three parts: a general information survey form, a survey form on the provision of integrated medical and preventive services, and a questionnaire on the collaboration level of family doctor teams in integrated medical and preventive services. The questionnaire was used to survey the implementation of integrated medical and preventive services and the collaboration status of family doctor teams in integrated medical and preventive services. Binary logistic regression was used to analyze the influencing

factors of family doctor team collaboration in integrated medical and preventive services. Results 76.1% of family doctors had a relatively high level of team collaboration in integrated medical and preventive services. The results of binary logistic regression analysis showed that family doctors with a bachelor's degree or above (OR=2.343), with junior professional title (OR=1.887) and intermediate or above professional title (OR=2.978), who understood the integrated medical and preventive service system (OR=6.618), who believed their institution attached importance to integrated medical and preventive services (OR=2.861), and who participated in training once (OR=2.561) and twice or more (OR=3.833) within six months had higher levels of team collaboration in integrated medical and preventive services ($P<0.05$). Conclusion At the current stage, there remains considerable room for improvement in the collaboration level of family doctor teams in integrated medical and preventive services. Efforts should continue to enhance family doctors' awareness of integrated medical and preventive services, improve institutional systems for providing integrated medical and preventive services, provide reasonable financial subsidies and policy incentives for family doctors, strengthen training, and further improve the collaboration level of family doctor teams.

Full Text

Preamble

Special Research on Integrated Medical and Preventive Care

Degree of Family Doctor Teamwork and Influencing Factors under the Program of Integration of Medical and Preventive Care

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Abstract

Background: As population aging intensifies and the burden of non-communicable diseases continues to rise, traditional health service models have

become insufficient to meet people' s health needs. Promoting the integration of medical and preventive care has therefore become crucial for improving residents' health levels. Family doctor teams, as the main implementers of these integrated services, play a pivotal role. However, current deficiencies in effective multidisciplinary collaboration among family doctor teams have severely hindered the implementation and provision of integrated medical and preventive care.

Objective: To investigate the teamwork status of family doctors in integrated medical and preventive care services in Shandong Province and explore its influencing factors, so as to provide reference for further improving the family doctor contract service system and integrated medical and preventive care.

Methods: In August 2023, we employed a multi-stage stratified random sampling method. Considering geographical location and economic development levels, we selected Yantai City (eastern region), Weifang City (central region), and Liaocheng City (western region) in Shandong Province. Within each city, one district and one county/county-level city were randomly selected as sample areas. A total of 481 family doctors were surveyed. Based on extensive review of domestic and international literature and expert consultations, we designed a specialized questionnaire for primary care doctors. The questionnaire comprised three sections: a general information survey form, a survey on the provision of integrated medical and preventive care services, and an evaluation of family doctor team collaboration levels in integrated care. Binary logistic regression analysis was used to examine factors influencing family doctor teamwork in integrated medical and preventive care services.

Results: Overall, 76.1% of family doctors demonstrated high levels of teamwork in integrated medical and preventive care services. Binary logistic regression analysis revealed that family doctors with bachelor' s degree or above (OR=2.343), primary professional title (OR=1.887) and intermediate or above professional title (OR=2.978), understanding of the integrated medical and preventive care system (OR=6.618), perception that their institution attached importance to integrated services (OR=2.861), and participation in training once (OR=2.561) or twice or more (OR=3.833) within six months had significantly higher teamwork levels ($P<0.05$).

Conclusion: There remains substantial room for improvement in family doctor teamwork levels in integrated medical and preventive care services. Efforts should continue to enhance family doctors' awareness of integrated services, improve institutional service provision systems, provide reasonable economic subsidies and policy incentives, and strengthen training to further elevate teamwork levels.

Keywords: Physicians, family; Integration of medical and preventive care; Teamwork; Service provision

Introduction

As population aging and the burden of chronic non-communicable diseases intensify, the “disease-centered” health service model can no longer meet the growing health needs of individuals and populations. To satisfy the demand for high-quality health services, comprehensive and integrated services that provide full-lifecycle health maintenance are needed [1-2]. “Integration of medical and preventive care” refers to breaking institutional and systemic barriers between medical service and public health systems across multiple dimensions including organizational management, resource allocation, information sharing, and workforce development, with the goal of disease prevention and improved population health [3]. The National Health Commission’s “Notice on Doing a Good Job in Family Doctor Contract Services in 2019” explicitly states that family doctor teams should serve as the vehicle, with chronic disease management (e.g., hypertension, diabetes) as the breakthrough point, to strengthen primary care integration of medical and preventive services. Family doctors should integrate public health services such as health record management, chronic disease follow-up, and health education with clinical treatment services [4]. Family doctor teams can fully integrate medical resources and play an important role in providing integrated medical and preventive care services. Previous research on family doctor teams providing integrated services has focused on service models [5] and implementation effectiveness [6]. However, current family doctor teams in China suffer from insufficient quantity and capacity, and lack multi-disciplinary and multi-professional collaboration, which hinders the provision of integrated medical and preventive care services [7]. This study aims to explore the teamwork levels and influencing factors among family doctor teams during the provision of integrated medical and preventive care services, providing reference for improving family doctor contract services and integrated care delivery.

Methods

Study Design and Setting

In August 2023, we conducted a multi-stage stratified random sampling based on geographical location and economic development levels. We selected Yantai City from eastern Shandong, Weifang City from central Shandong, and Liaocheng City from western Shandong. Within each city, one district and one county/county-level city were randomly selected as sample areas. From each district, we randomly selected three street community health service centers or township health centers, and from each county/county-level city, we randomly selected four township health centers or street community health service centers as sample units. Primary care doctors on duty at these facilities on the survey day were gathered, and approximately 15 village doctors/community doctors from their jurisdictions were randomly selected to complete the questionnaire.

A total of 537 questionnaires were distributed, and after excluding unreturned and incomplete questionnaires, 481 valid questionnaires were collected, yielding an effective response rate of 89.6%. This study complied with the regulations of the Ethics Committee of the School of Public Health, Shandong University, obtained ethical approval (LL20221120), and all participants provided informed consent.

Participants

This study targeted primary care clinicians with the following inclusion criteria: (1) clinical doctors on duty during the survey period; (2) understanding of and voluntary participation in the survey. Exclusion criteria were: (1) unwillingness to sign the informed consent form; (2) omission of key information or logical errors in questionnaire responses.

Survey Instrument

Based on extensive review of domestic and international literature and expert consultation, we designed a specialized questionnaire for primary care doctors comprising three sections: (1) General information survey including gender, age, marital status, education level, years of practice, professional title, and income; (2) Survey on provision of integrated medical and preventive care services including awareness of integrated services and implementation status at their institutions; (3) Family doctor team collaboration level questionnaire in integrated care, which we developed based on D'Amour's teamwork model [8]. This model conceptualizes multi-professional collaboration processes and actions in primary healthcare systems, encompassing four dimensions: shared goals and vision, internalization, governance, and formalization. Our questionnaire included five dimensions: shared goals and vision, internalization, governance, formalization, and incentives. All items used a 5-point Likert scale ranging from "strongly disagree" to "strongly agree" (scored 1-5). The shared goals and vision dimension comprised 4 items (total score 20); internalization comprised 7 items (total score 35); governance comprised 9 items (total score 45); formalization comprised 4 items (total score 20); and incentives comprised 6 items (total score 30). The overall teamwork level scale included 30 items with a total possible score of 150. We used 70% as the cutoff standard for determining high versus low levels across dimensions and overall scale. The questionnaire demonstrated good reliability and validity with a Cronbach's α coefficient of 0.978 and KMO value of 0.968.

Statistical Analysis

We used SPSS 17.0 software for statistical analysis. Categorical data were expressed as relative frequencies, and inter-group comparisons were performed using χ^2 tests. Binary logistic regression analysis was employed to identify influencing factors of family doctor teamwork in integrated medical and preventive care services. Statistical significance was set at $P < 0.05$.

Results

Participant Characteristics

Among the 481 family doctors surveyed, 264 (54.89%) worked in township institutions; 271 (56.3%) were female; 178 (37.0%) were aged 40-49 years; 419 (87.1%) were married; 216 (44.9%) had bachelor's degree or higher education; 152 (31.6%) had 20-29 years of practice experience; 196 (40.7%) held primary professional titles; 245 (50.9%) had middle income (2,500-4,999 yuan); 249 (51.8%) did not understand integrated medical and preventive care policies; 422 (87.7%) believed their institution attached importance to integrated services; 426 (88.6%) reported their institution provided economic subsidies for integrated services; and 264 (54.9%) had participated in integrated care training once within six months. See Table 1 .

Teamwork Levels in Integrated Medical and Preventive Care

Overall, 76.1% of family doctors demonstrated high teamwork levels in integrated medical and preventive care services. At the dimensional level, 83.2% scored high on shared goals and vision; 70.5% on internalization; 76.9% on governance; 81.7% on formalization; and 73.8% on incentives. See Table 2 .

Univariate Analysis of Influencing Factors

Univariate analysis revealed statistically significant differences in teamwork levels across categories of institution location, education level, professional title, policy understanding, perceived institutional importance of integrated services, perceived availability of economic subsidies, and training participation frequency within six months ($P < 0.05$). See Table 3 .

Regression Analysis of Influencing Factors

Using family doctor teamwork level as the dependent variable (low level=0, high level=1) and personal characteristics, policy understanding, perceived institutional importance, perceived economic subsidies, and training frequency as independent variables, binary logistic regression analysis showed: family doctors with bachelor's degree or higher had higher teamwork levels than those with high school/technical secondary education or below [OR (95%CI)=2.343 (1.019-5.388)]; those with primary [OR (95%CI)=1.887 (1.041-3.421)] and intermediate or above professional titles [OR (95%CI)=2.978 (1.176-7.541)] had higher levels than those without titles; those who understood integrated care policies had higher levels than those who did not [OR (95%CI)=6.618 (3.562-12.295)]; those whose institutions emphasized integrated services had higher levels than those whose institutions did not [OR (95%CI)=2.861 (1.484-5.513)]; and those who participated in training once [OR (95%CI)=2.561 (1.114-5.891)] or twice

or more [OR (95%CI)=3.833 (1.568-9.370)] within six months had higher levels than those with no training ($P<0.05$). See Table 4 .

Discussion

Substantial Room for Improvement in Family Doctor Teamwork

Our findings indicate considerable room for improvement in family doctor teamwork levels within integrated medical and preventive care services. Notably, the shared goals and vision dimension showed the highest proportion of high-scoring family doctors, suggesting that team members can mutually understand and establish common work objectives, maintain patient-centered approaches, monitor patient conditions timely, and encourage patient participation in treatment decision-making. When constructing team goals, family doctor teams should align team objectives with individual members' goals to stimulate intrinsic motivation and enhance belongingness and responsibility. The internalization dimension showed the lowest proportion of high-scoring family doctors, indicating insufficient internal team communication and training opportunities, and relatively low recognition of team members' competence and reliability. Institutions should provide integrated care-related training for team members, strengthen inter-member communication, and enhance trust to deepen mutual understanding [9].

Enhancing Policy Awareness and Training to Improve Teamwork

Our study identified education level, professional title, understanding of integrated care systems, and training participation as key influencing factors. Family doctors with higher education and senior titles have more exposure to integrated care and better recognize its purpose and importance [10]. Deepening understanding of integrated services can improve clinical competence and is significant for enhancing population health and alleviating medical difficulties. Fundamentally, medical education models should be reformed to transform healthcare professionals' perspectives on preventive medicine, break professional boundaries, and integrate clinical and preventive services. Institutions should regularly organize integrated care training and seminars, and develop competency-building programs focused on different diseases and population groups based on family doctor competency standards [11] to improve awareness and capability.

Strengthening Institutional Support and Management to Improve Teamwork

Family doctors' perception of whether their institution values integrated services significantly influences teamwork levels. Previous research also shows that China's current integrated medical and preventive care mechanisms are inadequate, with poor integration between medical and preventive services [12]. First,

primary care institutions should strengthen their focus on integrated services, improve talent cultivation and management systems, and promote better personnel allocation systems. Second, institutions need to establish collaborative working mechanisms, including internal collaboration among departments and external collaboration with other organizations, to improve overall operational efficiency and service quality.

Improving Economic Incentives and Performance Evaluation

Our results indicate that provision of economic subsidies for integrated services also affects teamwork. Research shows that after performance-based salary reforms in primary care institutions, income from public health work is lower than from clinical work, leading some clinicians to avoid public health tasks and hindering integrated care implementation [13]. We recommend establishing diversified funding mechanisms including government leadership with social donations and support to reasonably increase operational funds [14]. Additionally, innovative assessment and incentive mechanisms should be developed, creating team-based performance evaluation methods based on both medical and public health service quantity and quality, with performance-based salary distribution to motivate team members. Strengthening performance management through scientific evaluation mechanisms and indicator systems can provide comprehensive, objective assessments of team members' integrated service delivery and promote deeper implementation.

In summary, substantial room remains for improving family doctor teamwork in integrated medical and preventive care services. Primary care institutions should improve institutional arrangements for integrated services, refine performance evaluation and incentive mechanisms, provide economic subsidies, and enhance training to improve family doctors' awareness and teamwork levels.

Limitations

Research combining family doctor teams with integrated medical and preventive care practice remains limited. This study's innovation lies in integrating family doctor teamwork with specific integrated care content to enrich empirical research in this field. However, as a cross-sectional study, it cannot demonstrate changes over time or establish strong causal relationships, which may affect result accuracy. Future research should incorporate temporal dimensions to track changes in teamwork levels and improve result validity.

References

[1] Su Mingyang, Xu Jin, Liu Xiaoyun, et al. International experience and implications of integrating basic medical and public health services[J]. Chi-

nese Journal of Health Policy, 2021, 14(8): 67-73. DOI:10.3969/j.issn.1674-2982.2021.08.010.

[2] Zhao Linlin, Shao Shuang, Luo Qi, et al. Research on practice strategies for integration of medical and preventive care in domestic family doctor teams[J]. Chinese General Practice, 2023, 26(22): 2715-2719. DOI:10.12114/j.issn.1007-9572.2023.0246.

[3] Lei Tao, Yang Jinxia. The concept, theoretical basis, and implementation pathways of “integration of medical and preventive care” [J]. Anhui Journal of Preventive Medicine, 2023, 29(1): 1-3, 18. DOI:10.19837/j.cnki.ahyf.2023.01.001.

[4] Chen Jiaying, Hu Dan. Integration of medical and preventive care: connotation, barriers, and countermeasures[J]. Health Economics Research, 2021, 38(8): 3-5, 10.

[5] Li Jun, Jiang Yan, Bao Yuekui, et al. Analysis of implementation effects of the integrated model of medical and preventive care in family doctor teams[J]. Chinese Journal of Public Health Management, 2021, 37(5): 574-578. DOI:10.19568/j.cnki.23-1318.2021.05.0003.

[6] Liao Yujia, Chen Xiuxiang, Peng Xiaoping. Effectiveness evaluation of standardized management of hypertensive patients by family doctor teams[J]. Chinese Journal of Medicinal Guide, 2023, 25(2): 192-198. DOI:10.3969/j.issn.1009-0959.2023.02.014.

[7] Yu Menggen, Zhao Xuan, Li Huiwen, et al. Study on the integration behavior of medical and preventive care and its influencing factors among healthcare workers in primary care institutions in China[J]. Chinese General Practice, 2021, 24(1): 46-51. DOI:10.12114/j.issn.1007-9572.2021.00.037.

[8] D' AMOUR D, GOULET L, LABADIE J F, et al. A model and typology of collaboration between professionals in healthcare organizations[J]. BMC Health Serv Res, 2008, 8: 188. DOI:10.1186/1472-6963-8-188.

[9] Yi Lu, Liu Zhigang. Research on the construction of excellent teaching teams in universities based on team effectiveness[J]. Journal of Jiangxi University of Science and Technology, 2015, 36(6): 90-93. DOI:10.13265/j.cnki.jxlgdxxb.2015.06.018.

[10] Cao Junchen, Wang Wenting, Zhao Jimin, et al. Analysis of cognition evaluation and satisfaction of medical and preventive care integration among healthcare workers in Hangzhou public hospitals[J]. Modern Hospitals, 2023, 23(12): 1894-1897. DOI:10.3969/j.issn.1671-332X.2023.12.023.

[11] Yang Zhaohui, Liu Dongying. Implications of foreign general practitioner training in integrated medical and preventive care for medical education in China[J]. Continuing Medical Education, 2023, 37(11): 121-124. DOI:10.3969/j.issn.1004-6763.2023.11.031.

[12] Zhang Huanfang, Jin Tingting, Peng Lili, et al. Dilemmas and solutions

for integration of medical and preventive care in primary care institutions[J]. *China Rural Health*, 2022, 14(12): 33-37, 63. DOI:10.3969/j.issn.1674-361X.2022.12.012.

[13] Zheng Zhe, Guo Yan, Chen Hao, et al. Survey on the status quo and cognition of medical and preventive work in primary care institutions in China under the background of integration of medical and preventive care[J]. *Modern Preventive Medicine*, 2022, 49(21): 3932-3936, 3992. DOI:10.20043/j.cnki.MPM.202204419.

[14] Qu Wei, Chen Hao, Zheng Qi, et al. Construction and development of primary public health talent teams from the perspective of integration of medical and preventive care[J]. *Chinese Health Service Management*, 2021, 38(11): 839-843, 846.

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