BMC Primary Care

RESEARCH

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The effect of family physician team processes on chronic disease management performance from a structural network perspective

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Abstract

Objective The family physician team has become the core carrier for delivery primary health care in China. This study aimed to measure the effect of the network structural characteristics of family physician team processes on health performance. Strategic recommendations for optimizing the family physician team processes with a view to improving performance were presented.

Methods A cross-sectional survey was conducted from October to December 2021 in Qianjiang in Hubei Province and Changsha in Hunan Province. Task performance, contextual performance, social networks, and sociodemographic characteristics were collected. Social network analysis was conducted to calculate density and centralization, then hierarchical linear regression analysis was employed to explore the relationship between the network structural characteristics of family physician team processes and performance.

Results In total, 88 family physician teams attended in this investigation. The transition processes of family physician team showed a distinctive low density (0.272 ± 0.112), high centralization (0.866 ± 0.197) network structure. For family physician team, the density of action processes significantly and positively affected task performance ($B = 0.600$, $P < 0.05$); the centralization of action processes positively affected task performance ($B = 0.604$, $P < 0.01$); the density of action processes positively affected contextual performance ($B = 0.545$, $P < 0.01$); the density of interpersonal processes significantly and positively affected contextual performance ($B = 0.326$, $P < 0.05$).

Conclusion The network density and centralization of family physician team processes have positive effects on chronic disease management performance. The results from this study help to enhance our conceptual understanding of social network and its implications for team-dynamics. Optimizing family physician team processes is an effective way to strengthen the construction of family physician team and promote the quality and efficiency of family physician-contracted service. It is recommended to strengthen the management of team processes, enhance the internal collaboration mechanism, and optimize the centralized network structure of family physician team.

Keywords Family physician, Team process, Social network, Chronic disease, Performance

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Introduction

By the close of 2022, the proportion of individuals aged 65 and over in China's population had escalated to 14.9%. As China transitions into a deeply aging society, a multitude of issues, such as the surge in chronic disease patients, the sluggish development of home services, and the imbalance in the distribution of medical resources, have been thrust into the spotlight [1, 2]. These challenges complicate the achievement of comprehensive and full-cycle health management from the supply side. However, the implementation of the family physician-contracted service (FPCS) provides a promising solution. The family physician (FP) team is an effective health management model that has been widely adopted around the world. At present, more than 50 countries and regions have implemented the FPCS, including the United States, Germany, the United Kingdom, Australia and Cuba. The vital role of the FP team has been confirmed by practice and research in promoting the construction of a hierarchical diagnosis and treatment system, altering the model of medical and health care services, enhancing health equity, and preserving public health [3–5]. In 2022, against the backdrop of more than 420,000 FP teams having been formed, the Chinese government proposed an orderly expansion of the sources of the FP workforce. While FP teams play a pivotal role in delivering medical care and public health services to patients with chronic disease, there is a knowledge gap regarding how to fortify their structure and boost their performance.

Optimizing FP team performance is anticipated to be correlated with an enhancement in the quality and outcomes of healthcare delivery [3, 4, 6]. A team constitutes a group of two or more individuals who collaborate to accomplish organizational tasks and depend on one another to realize a shared value goal [7]. FP teams uphold the general attributes of teams, and team-related theories are applicable. Based on team effectiveness theory, team performance as an output is influenced by both input and process elements. The input elements primarily encompass the individual attributes of team members and the collective characteristics of the team, while the process elements are manifested as diverse team processes [8–10]. A team process signifies the ensemble of interactive behaviors among team members that metamorphosize inputs into output results through cognition, language, and activities tailored towards accomplishing a shared objective, which substantiates the kernel of the team's operation mechanism [11]. Past studies on FP teams have prioritized staffing and performance management [3, 12], which corresponds to a focus on the team's input elements and output outcomes. However, the effect of the process of the FP team was explored insufficient in the worldwide [13, 14]. Thus, apprehending how to describe the FP team processes, determining which team processes can effectively boost chronic disease management performance, and understanding how to optimize FP team processes are pivotal questions. This spectrum of inquiries demands resolution.

Advantageously, the team processes theory offers a lens through which we can scrutinize the research questions outlined above. This theory, divided into transition processes, action processes, and interpersonal processes based on a temporally conceptual framework, offers a granular understanding of group dynamics [11]. There is ample evidence suggesting that elements within the team process framework show significant positive correlations with indicators of effective teamwork such as team performance, member satisfaction, cohesion, and potency [15]. Such findings are not confined to academics, as in the field of clinical medicine, team process behaviors also influence performance [16]. The interaction between team members gives the team processes the structural characteristics of a relational network. However, one key limitation is that the traditional team processes theory largely focuses on the content of the procedures without much attention to its structure. Aiming to mitigate this gap, the configural theory of team processes utilizes the tools of social network theory and analytical methods. This enables the study of the network structure of team processes, advancing our grasp on how team processes can impact team effectiveness more comprehensively [17]. The structure inherent in these team processes should be seen as a crucial aspect when attempting to understand team effectiveness. In fact, it can provide a novel perspective for quantitatively studying team processes [18]. Under the imperatives of the current situation, [19, 20], marked by a relative shortage of primary health care workers, there arises an apparent need to explore and optimize the FP team processes. This optimization can serve as a conduit to improve team building and performance, and ultimately, the functioning of the hierarchical diagnosis and treatment system. This present study, responding to both theoretical extension and practical exigencies, delves into the FP team processes from the vantage point of the configural theory of team processes. Building upon this empirical research in the context of FP teams, this study enhances the configural theory of team processes, and in doing so, enriches the repertoire of health human resource management research. Furthermore, it probes into their relationship with chronic disease management performance, to furnish suggestions for strategies that can enhance the FP team processes.

Methods

Data source and study procedures

A comprehensive cross-sectional survey was carried out during October to December 2021, using a mix of

convenience and cluster sampling approaches. Our first step involved selecting the sample areas, which hinged upon the premise of an existing cooperative relationship with the research group. Accordingly, two counties, specifically Qianjiang in Hubei Province and Changsha in Hunan Province, were chosen. As the National Chronic Disease Comprehensive Prevention and Control Demonstration Area in China, the two counties have been providing chronic disease prevention, treatment and management services for the entire population throughout their life cycle, leading and driving the national comprehensive chronic disease prevention and control efforts, which can represent our target demographic. In the subsequent step, we randomly selected six township-level administrative divisions, spanning both communities and townships from each of the chosen sample areas. We established contact with local health care providers in these regions to confirm the total number of FP teams and acquire the names and contact details of team members. As a final preparatory step, we determined our sample populations through preliminary examination of the personnel rosters of the selected FP teams. Inclusion criteria for the survey respondents were current service and active participation in the FPCS.

Participants were requested to complete questionnaires, the objectives, content, and response options of which were explained in detail prior to their engagement. In order to ensure a smooth progression of the study, we enlisted the support of relevant staff from local health commissions to assist with coordination and organization. The participants' responses helped identify who they frequently interacted within their FP team. A relationship was marked as present if a team member's name was mentioned by the respondent. This data materialized in the form of a squared data-matrix, having rows and columns filled with the names of FP team members, with cell values indicating relationship status (1 for presence and 0 for absence). It should be noted that FP team members could associate with more than one FP team, based on how they answered the team membership question. For instance, community nurses, primary care physicians, or medical assistants might reveal affiliation with more than one family physician-led team, leading to overlaps in FP team membership. In these analyses, interactions with off-team members were not calculated into the team process network variables.

Data measures and hypotheses

The focus of our examination was the chronic disease management performance of family physician (FP) teams - our defined dependent variable. Performance, in this context, represents the aggregate contribution of each team member, both directly and indirectly, towards achieving team goals [21]. Given the multicultural nuances of our analysis, it's crucial that performance is assessed using a highly applicable framework [22]. We employed a two-factor model of performance, evaluating the performance of FP teams across two distinct but interrelated dimensions: task and contextual performance [23]. Task performance revolves around the principal behaviors of the FP team in offering contracted services that align with relevant policies. In contrast, contextual performance concerns the behavior of FP team members that nurtures collaboration, assists teammates, and strengthens relationships. To gauge the collective performance of each team, we employed leader ratings on a 5-point scale, where 1 indicates performance significantly below requirements and 5 significantly exceeding them. Data on teamwork performance were obtained by subjective assessment by the FP team leader. All teams' evaluations revolved around a six-dimension measure of performance, referring to the teamwork performance scale developed by Barrick et al. [24]. The task performance facets included initiative, workload, and work quality, while contextual performance facets encompassed helpfulness, cooperation, and interpersonal prowess. For these two performance scales, Cronbach's alpha values were 0.858 and 0.915, respectively, indicating high reliability.

Our independent variable constituted the degrees of density and centralization exhibited by FP team processes, which we posited impacts performance. We delineated the multiple social networks within the FP team into three categories: transition processes, action processes, and interpersonal processes. We deployed social network analysis - an empirically robust technique that quantitatively elucidates relationships within a social network - to delineate the network structural characteristics of FP team processes. Both density and centralization factors were predicted to influence performance positively. Density, which quantifies the overall level of interaction within teams, can foster positive intentions among team members to implement acquired information in their work [25, 26]. Density is computed by taking the proportion of actual network ties over the total potential network ties. High-density networks typically harbor abundant interactions among FP team members, potentially driving up task dependency through efficient team processes. Centralization aptly represents the concentration of interactions within a single unit, pertinent to team results [25, 27]. Centralization is calculated as the collective disparity in the nominations of in-degree between the highest in-degree node in the network and all other nodes, divided by the maximum sum of differences feasible in any network of identical size. In a centralized network, certain members can act as information brokers across unconnected actors, which could augment the functioning of the FP team.

Table 1 Sociodemographic characteristics of FP team members ($n=473$)

Characteristics	Frequency	Percentage (%)
Gender		
Male	180	38.05
Female	293	61.95
Educational Background		
High School and Below	108	22.83
College Degree	201	42.49
Undergraduate Degree	164	34.67
Position		
Physician	225	47.57
Nurse	96	20.30
Public Health Worker	93	19.66
Other	59	12.47
Age		
< 30	81	17.12
30–39	157	33.19
40–49	183	38.69
≥ 50	52	10.99
Work Experience (in years)		
< 10	124	26.22
10–19	133	28.12
20–29	166	35.10
≥ 30	50	10.57

Finally, the control variable factored into our study was the size of the FP team, reflecting the total number of team members. The team size can potentially determine the ease or frequency of communication between individual members [28]. Typically, smaller teams foster more frequent communication among members. Therefore, team size may substantially influence the outcome of team processes linked to performance [29]. Due to this predicted influence, we incorporated team size as a control variable in the study. The questionnaire used to collect data for this study is available in Additional File 1.

Statistical analysis

Data management and storage were executed using Excel, while UCINET 6 was utilized for devising networks and deriving network parameters. All remaining analyses were conducted with the use of SPSS 26. FP team and member characteristics were portrayed as frequency distributions and percentages for clarity. In parallel, the network structural traits of team processes and the performance of the FP team were expressed in the form of minimums, maximums, means, and standard deviations. Verifying the influence that FP team processes exert on performance required the utilization of correlation analysis and hierarchical linear regression analysis. If the P-value was less than 0.05, it implied statistical significance of the tested relationships.

Table 2 Network Structural Characteristics of Team Processes and performance of FP team

Variables	Min	Max	Mean	SD
Density of Transition Processes	0.111	0.612	0.272	0.112
Density of Action Processes	0.125	1.000	0.412	0.176
Density of Interpersonal Processes	0.143	1.000	0.414	0.174
Centralization of Transition Processes	0.333	1.000	0.866	0.197
Centralization of Action Processes	0.000	1.000	0.538	0.287
Centralization of Interpersonal Processes	0.000	1.000	0.451	0.244
Task Performance	2.000	5.000	3.572	0.720
Contextual Performance	2.000	5.000	3.432	0.734

Results

A total of 593 FP team members from 12 primary care facilities were invited to participate, and 580 completed valid questionnaires. Given that the social network analysis requires the calculation of centralization, a criterion of a minimum of 4 team members is required. Therefore, after eliminating 107 questionnaires that did not meet this criterion, the team size of the surviving 88 FP teams met the requirement. This elimination left a total of 473 valid questionnaires, with a valid response rate of 79.76%.

Table 1 shows the characteristics of the sample members. Females and males represented 61.95% and 38.05% of the respondents, respectively. Most participants have an education level of a college degree or higher (77.17%). The proportion of physicians is close to half (47.57%), a factor which may be related to the role of nurses, public health workers, and others, who mainly assume a supporting role in the FPCS. The ratio of positions aligns with the need for FP teams to provide primary and public health services to contracted residents. The age distribution of respondents is predominantly between 30 and 49 years old (71.88%), and the majority also share a concentration of 10 to 29 years of work experience (63.21%). To afford a better understanding of the career commencement age, we calculate the difference between age and years of experience as an estimate of age at start of career (excluding factors such as non-employment). This reveals that respondents, overall, commenced their careers at younger ages, such as physicians (mean=21.764). The total sample comprises 88 FP teams, 57 in Qianjiang and 31 in Changsha. The team sizes range from 4 to 7 members (95.45%), with a maximum size of 9 members. Female-dominated teams form a notable proportion (71.59%). The number of work types within the team predominantly falls between 3 and 4 (76.14%). The characteristics of the sample appropriately reflect the general situation of primary health care in China.

Table 2 presents the minimums, maximums, means, and standard deviations of calculated team social network variables and performance metrics. Our findings show that the FP teams exhibited a higher density of action processes (mean=0.412) as well as interpersonal

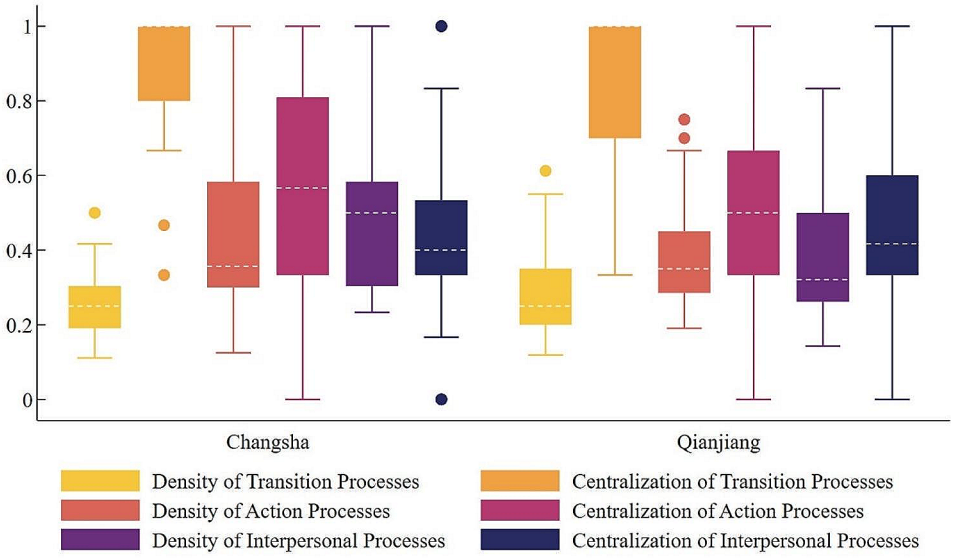

Fig. 1 Box plot of density and centralization of the FP Team Processes in Qianjiang and Changsha

Table 3 Correlations of variables

	Variables	1	2	3	4	5	6	7	8
1	Density of Transition Processes	-							
2	Centralization of Transition Processes	-0.308**	-						
3	Density of Action Processes	0.467**	-0.195	-					
4	Centralization of Action Processes	-0.038	0.499**	-0.576**	-				
5	Density of Interpersonal Processes	0.314**	-0.135	0.806**	-0.431**	-			
6	Centralization of Interpersonal Processes	-0.042	0.262*	-0.367**	0.537**	-0.510**	-		
7	Task Performance	0.156	-0.087	0.282**	0.052	0.322**	-0.136	-	
8	Contextual Performance	0.289**	-0.184	0.711**	-0.370**	0.714**	-0.358**	0.460**	-

*$P<0.05$ **$P<0.01$

processes (mean=0.414). However, the mean density of the transition processes appeared relatively low, at 0.272. This lower density suggests that FP teams were less connected and seemingly more divergent during the processes of assessing and planning the goals of the FPCS. Previous studies have concluded that high variance value reflects low network centralization, while low variance value reflects high network centralization [30, 31]. We also observed lower centralization of action processes (mean=0.538) and interpersonal processes (mean=0.451) within the FP teams. In contrast, the mean centralization of the transition processes was relatively high at 0.866, indicating a more concentrated network relationship during the phases of goal assessment and strategic planning for the FPCS. Regarding performance comparison, team task performance was observed to slightly surpass contextual performance.

To better illustrate these findings, we visually compared the process network dynamics within FP teams across both Qianjiang and Changsha regions. We calculated their densities and centralization values pertaining to transition processes, action processes, and interpersonal processes, respectively. This information is represented via box plots, constructed based on corresponding median, upper quartile, lower quartile, and extremum values, as shown in Fig. 1. The comparison revealed that there exists substantial potential to augment the density of all six observed processes when considering the theoretical maximum. The mean density of the action and interpersonal processes in Changsha marginally exceed those in Qianjiang. Additionally, the centralization of the FP teams' action processes, and interpersonal processes, in both Qianjiang and Changsha, present ample opportunities for optimization when contrasted with the theoretical maxima. In comparing the centralization mean values, those for transition and action processes in Changsha were found to surpass their counterparts in Qianjiang.

The correlation coefficients, as outlined in Table 3, indicated that task performance exhibited a strong positive correlation with the density of both the action and interpersonal processes. Similarly, contextual performance was found to be positively correlated with the density of all observed processes: transition processes, action

Table 4 Results of hierarchical Linear Regression Analysis Predicting Task Performance

	Model 1		Model 2	
	B	t	B	t
Team Size	-0.041	-0.381	0.225	1.576
Density of Transition Processes			-0.090	-0.583
Centralization of Transition Processes			-0.242	-1.775
Density of Action Processes			0.600*	2.626
Centralization of Action Processes			0.604**	3.421
Density of Interpersonal Processes			0.123	0.654
Centralization of Interpersonal Processes			-0.169	-1.306
F	0.146		4.036	
R^2	0.002		0.261	

*$P<0.05$ **$P<0.01$

Table 5 Results of hierarchical Linear Regression Analysis Predicting Contextual performance

	Model 3		Model 4	
	B	t	B	t
Team Size	-0.448*	-4.646	-0.092	-0.856
Density of Transition Processes			-0.171	-1.468
Centralization of Transition Processes			-0.180	-1.757
Density of Action Processes			0.545**	3.177
Centralization of Action Processes			0.215	1.622
Density of Interpersonal Processes			0.326*	2.311
Centralization of Interpersonal Processes			-0.046	-0.477
F	21.588		15.945	
R^2	0.201		0.582	

*$P<0.05$ **$P<0.01$

processes, and interpersonal processes. Conversely, there was a notable negative correlation between the contextual performance and the centralization of both action and interpersonal processes.

Table 4 provides the results of a hierarchical linear regression analysis predicting task performance. The density and centralization of action processes, when controlled for the covariate, showed a strong positive relationship with task performance (with *B* values of 0.600 and 0.604, respectively, and $P<0.05$ and $P<0.01$ correspondingly).

Lastly, the results of the hierarchical linear regression analysis predicting contextual performance are presented in Table 5. Once again controlling for the covariate, the density of action processes and interpersonal processes showed a positive relationship with contextual performance (with *B* values of 0.545 and 0.326, respectively, and $P<0.01$ and $P<0.05$ correspondingly).

Discussion

The FP team is a multidisciplinary collaborative healthcare team with its own unique characteristics, including multiple social networks. This study aimed to analyze the effect of FP team processes on their task performance and contextual performance in terms of three dimensions: transition processes, action processes and interpersonal processes. The FP team is generally similar to FP- oriented primary care models in other countries. The application of network analysis to FP team processes provides a novel perspective for examining the organization of primary health care. There is significant potential to ameliorate the overall interaction and cohesion within FP team processes. FP teams exhibit different network structure characteristics in transition processes, action processes and interpersonal processes. Only the centralization of transition processes scores high, leaving room for augmentation within the density of transition processes, the density and centralization of action processes and interpersonal processes. Compared to their hospital-working counterparts, primary health care professionals recorded lower values in most network measures [32]. The overall density of the FP team fared worse than that of the primary care team [33]. This could be due to some FP team members being part-time, hence maintaining weaker connections to each other [3]. The organizational framework of FP teams was mainly designed and established by health administration departments and primary health care institutions [34]. Although FP team members hailing from diverse professional backgrounds boost the delivery of intricate primary care, public health, and health management services, differing professional knowledge reservoirs may hamper effective internal communication. In general, the centralization of FP teams trumps that of primary care teams [33], but there still lurks a gap with the ideal ceiling. This gap implies that certain team leaders are not fully leveraging their leadership capabilities. With the FP's expertise and resources holding more weight than those of other team members [35, 36], the role of the leader needs to be fully utilized. The mean density of the FP team's action processes and interpersonal processes outstripped that of the transition process, diverging from prior studies that scrutinized the social network in health care teams. Health care teams typically demonstrate a higher density in friendship networks than consultation networks [37]. Whether it is consultation and friendship networks, or action, transition, and interpersonal processes, they are all based on social interaction. While friendship networks focus on emotional exchange, support, and companionship, interpersonal processes focus more broadly on the interaction, communication, and relationship development of individuals in interpersonal interactions. The consultation networks, as an instrumental network, represent the extent to which members of the FP team interact with each other to solve problems encountered in their work, covering the action and transition processes of this study. Although the density of the interpersonal processes in this study markedly outshone that of the transition processes, it paralleled that of the action processes. The dimensional segmentation

of the team processes is sharper than the traditional bi-dimensional framework split between consultation and friendship networks. Partly, this study discloses that the disparity in density between consultation and friendship networks may spring from the transition processes, not necessarily from the action processes.

The density of the FP team's action processes shows a positive connection with both task performance and contextual performance. It is typically observed that teams with denser networks bear superior performance outcomes [25]. Coupled with the mandate for team members to collaboratively fulfill contracted services, this study contends that the proximity of the FP team's action processes somewhat encapsulates the task interdependence dotting various facets of contracted services. Task interdependence influences performance via team functionality [38]. The interdependence among team members for the valid consumption of team resources propels them to reap benefits from collaborative task handling. Those FP team members who gain advantages from collaboration tend to display more engagement in interactive behaviors with their fellow team members. The escalated frequency of such interactions in turn fuels FP team members to refine task cooperation further. The density of the FP team's interpersonal processes exerts a positive influence on contextual performance. Within a collaborative environment nurtured by familiarity and information exchange, FP team members manage to sketch a clearer roadmap towards goal realization. Such a scenario births a stronger belief across the team to succeed in delivering the contracted services and establishing robust interpersonal tie-ups.

The centralization of the FP team's action processes also bears a positive association with task performance. While centralized network structures are typically linked to negative performance outputs, the effect of centralization largely leans on the context and nature of the network [25]. A centralized authority structure offers a safe and predictable landscape for the team when the team structure navigates simplicity [39]. The degree of centralization usually stands in negative relation to team performance [40]. However, paradoxically, centralized network structures can facilitate robust information flow among team members who otherwise remain unconnected, thereby enhancing performance output [41]. A centralized network structure grants opportunities for effective information spreading, improved decision-making accuracy, thereby boosting team effectiveness [17]. FP team members can then redirect their focus onto their work tasks, bolster their professional prowess, while side-stepping the potential negative impacts of multiple leaders and intricate interpersonal liaisons. This centralized network structure stipulates FP teams to effectively propagate information, lessen duplicated efforts, and advance decision-making precision, thus ramping up team efficiency.

The FP team is still in the exploratory stage in China and has not been able to achieve the policy goal of community-based primary care well during the pilot process. At the very least, it still falls short of the desired policy effect. This is not because the policy itself is unreasonable or wrong, but because it has not been properly adapted to the medical culture and habits of the Chinese people in the process of "localization". The relationship between the responsibilities, rights and benefits of higher-level hospitals and the FP team has not been well clarified. Therefore, it is necessary to draw on the successful experience of other countries to achieve complementarity of advantages and improve deficiencies. The professional competence of a team forms the foundation for the delivery of quality services. The level of professional competence of the FP, being the central role within the team, is a critical factor in assessing the overall professional competence of the FP team. However, disregarding periods of unemployment, the average working age of the surveyed physicians was still less than 22 years. This implies that a certain proportion of the physicians in the FP team received on-the-job training, suggesting that their total time spent in general higher education was relatively brief. This observation is partially corroborated by previous studies [5]. There is a noted deficiency of qualified physicians in community health centers and township health centers [42]. In a scenario where health workers possess limited qualifications and expertise, the optimization of FP team processes, commencing with workforce reform and aimed at enhancing chronic disease management performance, becomes an indispensable aspect of human resource management within FP teams. We hope that through the study of the FP team processes, it can further promote the continuous improvement of hierarchical diagnosis and treatment systems, increase the availability and accessibility of health resources, improve the public health inequality, enable FP team to truly play their role as the "gatekeepers" of health, and thus contribute to the realization of the strategic goal of the Healthy China 2030.

This study yields significant implications for leaders overseeing FP teams. Firstly, a push to bolster FP team processes management appears advisable. This could drive reform in the inventory of health human resources. The scope of team assessments must be expanded, integrating the process quality dimension of FP teamwork level into the performance evaluation index system. Development of an information tool dedicated to dissecting FP team processes might also prove beneficial. It would monitor the values of network structure characteristics to ensure the effective usage of team process information. Secondly, team leaders ought to improve internal

collaboration mechanisms to augment the service capacity of the FP team. Emphasis should be placed on the distribution of performance rewards for shared successes. This approach encourages team members to reap benefits from internal collaboration and fosters robust partnerships. As the spearhead of the FP team, the leader bears the responsibility of coordinating work from a comprehensive perspective. They should create an enriching environment for FP team engagement and bolster team cohesion. Thirdly, organizational leaders need to orchestrate a centralized power asymmetric team structure and guide the FP team towards establishing a system of reciprocal governance. The status of FP team leaders must be elevated via formal appointments and supportive policies to accentuate their influence in mission execution. Recognition of the power asymmetry by the entire team is also a necessary step. Additionally, external supervision should be fortified in order to mitigate any potentially adverse consequences stemming from an excessive concentration of power.

Study limitations and future research

The limitations of this study are primarily tied to its design as a cross-sectional survey at a specific time point. This approach lacks the dynamism offered by continuous network tracking of FP teams and does not investigate the longitudinal effects of FP team processes on performance. Moreover, the data for this study is sourced, via questionnaires, from Qianjiang and Changsha, both situated in central China. Consequently, the FP team's processes might exhibit specific geographical and cultural characteristics that could influence the panoptic applicability of our findings.

The study represents an initial attempt to apply the configural theory of team processes to FP teams. The team processes and performance variables were subjectively rated by the FP team members themselves. For future research, a possible direction might be the uptake of higher-order model variables of the team processes and objective performance data. Uniting these in conjunction with paired analyses could extend our knowledge about FP teams and their functioning.

Conclusion

Rooted in the configural theory of team processes and the social network multiplicity specific to FP teams, this study has analyzed the impact exerted by FP team processes on their task performance and contextual performance across three dimensions: transition processes, action processes, and interpersonal processes. The findings show that aside from the centralization of transition processes, there exists room for enhancement concerning both the density and centralization of FP team processes. In the realm of FP teams, density in action processes impacts task performance and contextual performance, while centralization in action processes facilitates task performance. Furthermore, the density of interpersonal processes registers a positive effect on contextual performance. Therefore, optimizing FP team processes emerges as an effective strategy in fortifying FP team construction and fostering the quality and effectiveness of FPCS. The study proposes the strengthening of team process management, the improvement of internal collaboration mechanisms, and the optimization of centralized network structures within FP teams.

Abbreviations

FP	family physician
FPCS	family physician-contracted service
Min	minimum
Max	maximum
SD	standard deviations
P	P-Value
B	Beta

Acknowledgements

The authors thank the Health Commission of Qianjiang in Hubei Province and Changsha in Hunan Province, for their willingness to support this survey.

Author contributions

YC and ST conceived this study. YC performed the data analysis and wrote the main manuscript text. ZZ performed the revision and proofreading of the manuscript. EY, HQ and YW contributed to the data acquisition and provided statistical analysis support. All authors reviewed and approved the final manuscript.

Funding

The National Key R&D Program of China (Grant NO: 2022YFE0133000), the National Natural Science Foundation of China (Grant NO: 72004073, 72374079) and the Nanyang Science and Technology Development Plan Project (Grant NO: 23RKX126) funded this research.

Data availability

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

The approval for this study was obtained from the Ethics Committee of Tongji Medical College, Huazhong University of Science and Technology (IORG No: IORG0003571). All participants read a statement that explained the purpose of the survey. Written informed consent was obtained from all participants in this study. All methods in this study were performed in accordance with the relevant guidelines and regulations.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

Received: 3 January 2024 / Accepted: 30 July 2024
Published online: 10 August 2024

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