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Research article

The research environment and reward preferences of primary care practitioners in the shanghai general practice research network: A mixed methods study☆

Yang Wang[a,b], Ying Pan[a,b], Hua Jin[a,b], Hui Yang[c], Helen Elizabeth Smith[d], Dehua Yu[a,b,*]

[a] Shanghai General Practice and Community Health Development Research Center, Shanghai, China
[b] Department of General Practice, Yangpu Hospital Affiliated to Tongji University, Shanghai, China
[c] School of Public Health and Preventive Medicine, Monash University, Melbourne VIC, Australia
[d] School of Medicine, Faculty of Medicine and Health Sciences, University of Keele, Keele, Staffordshire, UK

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ABSTRACT

Background: Practice-Based Research Networks (PBRNs) enable collaborative primary care research. In China, since 2023, healthcare reforms emphasizing community-based primary care have spurred PBRN development. However, the research environment and incentives for primary care practitioners (PCPs) to belong to these networks remain under-explored.
Objective: This study investigates the research environment and support needed by PCPs in the Shanghai General Practice Research Network (SGPRN) to maximize PBRN development in China.
Methods: This study employed a mixed-methods explanatory sequential design. The quantitative component involved an online survey of 145 PCPs from the SGPRN, selected through purposive sampling, who expressed interest in research activities. The survey collected data on their background, research capabilities, research environment, and preferred incentives for participating in PBRN-organized research. Descriptive statistical analysis and the Kano Model were used to analyze and categorize the data. The qualitative component involved one focus group discussion and 21 semi-structured interviews with 24 PCPs from the survey sample, selected to validate and complement the quantitative findings. Interview data were analyzed iteratively using a qualitative descriptive approach. Quantitative and qualitative data were integrated through joint display and meta-synthesis.
Results: Most PCPs (85 %) reported a supportive research environment, with 69 % integrating research with clinical practice. However, only 43 % had sufficient research time, and 50 % access to collaborators. Qualitative findings revealed limited professional support and fragmented time as key barriers. Incentives required included opportunities to acquire research skills, leading personally relevant studies, securing primary authorship, and accessing shared data, all contingent on transparent collaboration and trust. All these preferences aligned with institutional performance-driven policies.
Conclusion: The SGPRN research environment is currently neutral to slightly favorable, strongly driven by performance-oriented policies. PCPs participate in PBRN research primarily to enhance their research expertise and achieve publication-driven career advancement. Despite these motivations, China's PBRNs need to draw on international strategies, enhancing research training, fostering collaborative platforms, and prioritizing practice-oriented, high-quality research to improve patient care, while aligning with local general practitioners' professional aspirations for advancing the discipline and clinical practice, to reconcile and overcome the limitations of output-focused, impractical research policies.

Introduction

The World Organization of Family Doctors (WONCA) highlights in its research handbook, based on extensive evidence from North America, Europe, and other regions, that primary care research is pivotal to advancing general practice and primary care.[1] Active participation of primary care practitioners (PCPs) is crucial for such research. Practice-Based Research Networks (PBRNs), a key global framework, provide a structured platform for integrating research into clinical practice.[2-4] Dolor et al.'s guidance[5] suggests PCPs are the core PBRN members, serving

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* Corresponding author.
E-mail address: ydh1404@sina.com (D. Yu).

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Fig. 1. Self-reported research experience of primary care practitioners participating in the study.

as practice facilitators, research assistants, or when leading projects, the principal investigator (PIs).

In recent years, primary care systems in North America and Europe have transitioned toward learning health systems (LHSs), integrating science, data, and organizational culture to continuously generate knowledge from clinical and health service data.[6]

This real-time learning drives improvements and innovations in healthcare quality. Within this context, some Practice-Based Research Networks (PBRNs) have evolved into Primary Care Practice-Based Research and Learning Networks (PBRLNs).[7] The deeper exploration of the role of PCPS in PBRNs and PBRLNs is essential, it helps us understand : (1) how research context shapes PCPs' capabilities, enabling effective contributions to PBRN research; and (2) how incentives drive their motivation, sustaining long-term engagement. Together these factors critically influence PCPs' capacity and willingness to participate, determining PBRNs' scientific productivity, organizational structure, and ability to advance clinical practice.

Since 2023, China has established four PBRNs in Beijing, Shanghai, Zhejiang, and Sichuan,[8-11] and possibly more, to advance primary care research. However, information on their organizational structures, research strategies, and the research context and incentives for participating PCPs is scarce. Despite global studies identifying factors like institutional support and skills that influence PCPs' research engagement,[12] and the need for incentives to offset opportunity costs,[13-16] China's primary care system differs markedly from Western models. It is dominated by state-managed public institutions, lacks any gatekeeping system, and is characterized by a publication-driven research culture that links to promotions and financial rewards for clinicians.[17,18]— Consequently, international evidence may not always be generalizable, necessitating further exploration of local conditions to tailor China's PBRN strategies.

To address the critical need for tailored strategies in China's Practice-Based Research Networks (PBRNs), our research team conducted a mixed-methods study with an explanatory sequential design, focusing on the Shanghai General Practice Research Network (SGPRN). The study aimed to: (1) examine the research context of PCPs interested in general practice and primary care research within SGPRN; (2) identify the key incentives motivating their participation in SGPRN research activities. These insights provide practical knowledge to strengthen not just SGPRN, but other Chinese PBRNs and research teams to optimize their organizational and research approaches.

Methods

This study employed a mixed-methods explanatory sequential design,[19] integrating a participant questionnaire survey, followed by qualitative interviews based on survey findings, and data synthesis. This approach enhances the practical relevance of quantitative results through contextualized qualitative insights, improving their applicability to real-world strategies. The qualitative phase further validates quantitative findings, strengthening the study's utility.

Quantitative section

The study population included PCPs within the SGPRN interested in general practice and primary care research. Using a purposive sampling approach, we recruited participants during a research skills training session organized by SGPRN in September 2024. Recruitment involved 27 SGPRN-affiliated community health centers, each nominating five PCPs identified by their managers as having research potential, and 23 non-affiliated centers, each recommending two PCPs with similar qualifications and interest in future SGPRN participation.

Participants were included if they: (1) worked at an SGPRN-affiliated community health centre; (2) scored 6 or higher on a 10-point scale assessing willingness to engage in general practice and primary care research. After excluding 30 individuals who did not meet these criteria and 6 who declined participation, 145 primary care practitioners (PCPs) completed the survey. Fig. 1 shows their geographic distribution across Shanghai districts.

The survey was an electronic questionnaire designed using Wenjuanxing (https://www.wjx.cn/), and informed by prior studies and scoping reviews [Awaiting user-provided citation, e.g., 12]. There were four sections: (1) basic information on scientific research; (2) a Primary Care Research Capacity Scale, adapted from the WReN-Spider scale,[20] translated into Chinese, validated, and tailored for this study; (3) a research context assessment, based on scoping reviews,[12] using a 4-point Likert scale (1 = "Not at all," 2 = "Uncertain," 3 = "Somewhat true," 4 = "Definitely true"); (4) a research participation incentives section, developed using prior literature and the Kano Model,[21] incorporating positive framing (willingness to engage in SGPRN research with specific incentives) and negative framing (likelihood of declining without them). The scoring details are shown in Table S1.

Table 1
Demographic and professional characteristics of participants.

Item	Number	Percentage
Gender		
Male	32	22.07
Female	113	77.93
Age		
≤ 30 years	26	17.93
30–39 years	74	51.03
≥ 40 years	45	31.03
Educational level		
Bachelor's degree or below	81	55.86
Master's degree	63	43.45
Doctoral degree	1	0.69
Specific profession*		
General Practitioners	98	67.59
Traditional Chinese Medicine	28	19.31
General Practitioners		
Specialists in community health centres	3	2.07
Nurses	9	6.21
Public health doctors	7	4.83
Years of clinical experience		
≤5 years	35	27.13
6–10 years	42	32.56
≥ 10 years	52	40.31
Serving as a family doctor		
Yes	90	69.77
No	39	30.23
Number of patients served in the past week		
≤ 10 patients	31	24.03
11–25 patients	25	19.38
26–50 patients	50	38.76
> 50 patients	23	17.83
Have published primary care research		
Yes	52	35.86
No	93	64.14
Total	145	100

Footnote: In China, primary care facilities (similar to Cuba's polyclinics) employ a variety of healthcare professionals, including general practitioners, specialists, public health physicians, and nurses. In this context, we collectively refer to them as primary care practitioners (PCPs), which may differ from definitions used in other countries.

The survey was distributed electronically to participants at the start of the skills training course, inviting completion via mobile phone or computer. The link remained open for 2 weeks, with three reminders sent to encourage completion, concluding on the 14th day.

After cleaning the collected data, we performed descriptive statistical analyses using Stata (StataCorp, version 17) to evaluate participants' basic characteristics, self-reported primary care research capacity, and self-assessed research context. Percentages (%) summarized categorical data, while means and standard deviations (SDs) reported continuous data. We then applied the Kano Model classification method[21] to categorize PCPs' perceptions of incentives for participating in SGPRN research activities. Responses to positively and negatively framed survey questions classified six incentives into four Kano categories: (1) Performance attributes, significantly enhancing network attractiveness; (2) Attractive attributes, boosting satisfaction when offered; (3) Must-be attributes, essential for network appeal; (4) Indifferent attributes, minimally impacting perceptions. Classification criteria are detailed in Table S1.

Qualitative section

To help interpret and validate the quantitative findings, we conducted qualitative interviews with participants willing to discuss research involvement further. Using maximum variability sampling, we selected participants based on gender, age, education, clinical experience, and self-reported research capacity to ensure diverse representation. The qualitative component included an initial focus group discussion and subsequently 21 semi-structured interviews, employing a qualitative descriptive approach.[22] Aligned with the mixed-methods explanatory sequential design, the interviews were guided by themes from the quantitative survey, informed by published literature reviews and studies, focusing on two core areas: the research context of PCPs and their preferred incentives and support from the SGPRN. Specific interview questions, derived from these themes, are detailed in Table S2.

The initial focus group discussion of an hour took place on October 12, 2024, during a lunch break at the SGPRN research training session, led by a primary care research expert and a research-active general practitioner (GP) with three primary care practitioners (PCPs). As discussions deepened, participants critically evaluated institutional leadership, research management, and policies, prompting a shift to one-on-one semi-structured interviews for subsequent sessions to foster candid responses on sensitive topics while ensuring convenience. These interviews were conducted via online meetings between 7:00 PM and 10:00 PM, with a single researcher engaging each participant for 30–50 min.

To ensure informed consent and participant autonomy, we followed these procedures: (1) At least one day prior, researchers contacted participants to schedule interviews, providing an informed consent form to review topics, ethical considerations, and confidentiality measures, enabling informed participation decisions. (2) At each interview's start, researchers outlined the study's background and objectives, revisited the consent process, addressed concerns, and confirmed recording for research purposes. (3) Interviews were conducted in an open, supportive environment, guided by a predefined semi-structured interview guide to maintain consistency.

Interview data were analyzed using the constant comparison method,[23] iteratively and cyclically alongside data collection. Each interview was analyzed the following day, enabling researchers to refine subsequent questions based on emerging insights. This dynamic approach ensured responsive data collection. Audio recordings were automatically transcribed and manually reviewed for accuracy. Researchers performed line-by-line coding of transcripts, generating codes from raw data with analytical notes. Codes were grouped into subthemes, organized under the study's two core themes: PCPs' research context and incentives. A third researcher joined the two interviewers for partial data analysis, with all three cross-checking findings and resolving discrepancies through group discussions.

Data saturation was evaluated during semi-structured interviews. By the 17th and 18th interviews, researchers noted clear information redundancy in coding and analysis. Three additional interviews confirmed the emergence of no new codes or themes, indicating acceptable saturation. Reflexivity was incorporated through two strategies: (1) interviewers summarized and restated participants' responses aloud during interviews for real-time confirmation or clarification; (2) in later interviews, interviewers discussed synthesized themes from earlier sessions with participants to validate interpretations and identify discrepancies or insights. These procedures ensured the interview data authentically captured participants' experiences and perceptions. Real-time verification and ongoing comparative analysis enhanced the rigor and credibility of the qualitative findings.

Integration

We integrated quantitative and qualitative data using the Joint Display method[24] and meta-inference approach.[25] This process entailed interpreting and validating quantitative results with qualitative data, analyzing relationships between datasets, and incorporating relevant literature and practical experience to yield comprehensive, contextually relevant insights. These methods enabled a holistic understanding of the findings, ensuring robustness and real-world applicability.

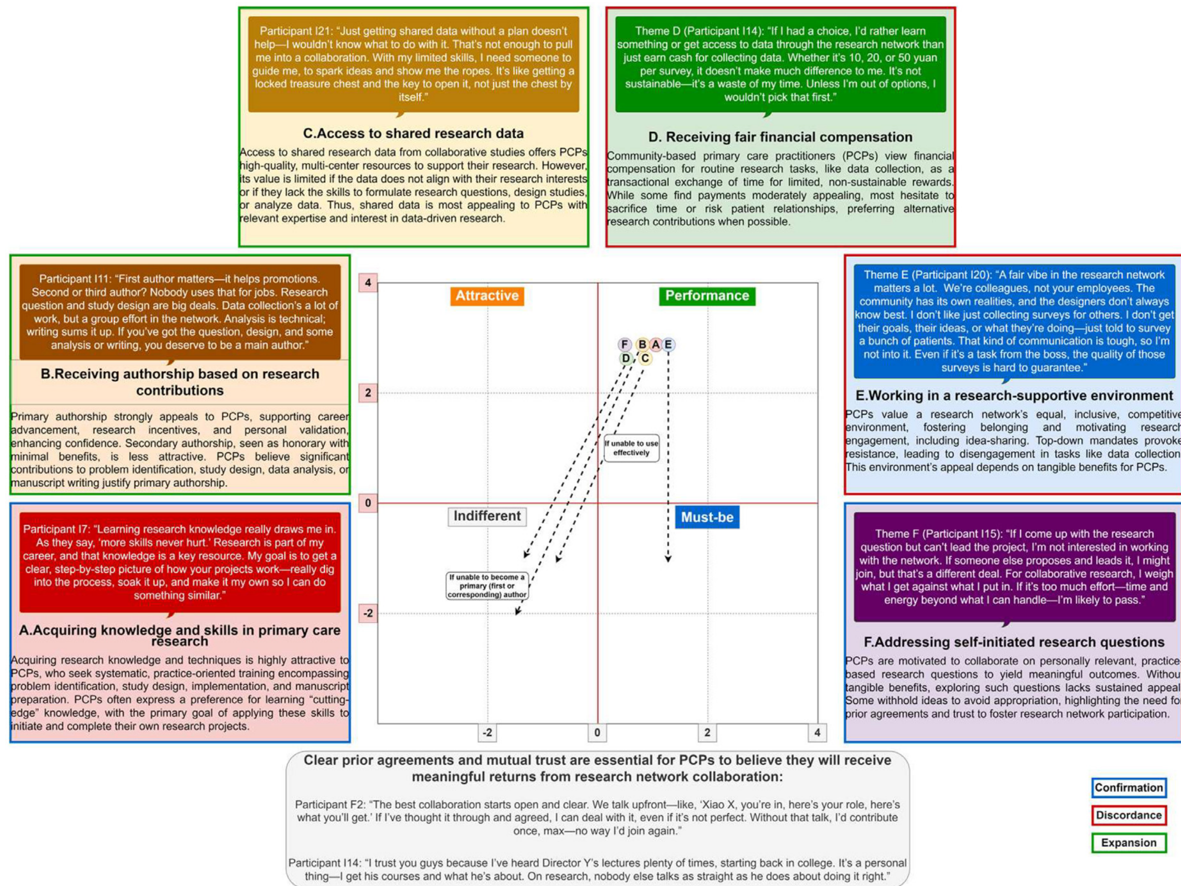

Fig. 2. Preferences of primary care practitioners in the Shanghai General practice research network for rewards from research participation, informed by qualitative research.
Note: PCPs: primary care practitioners

Ethical statement

This study adhered to rigorous ethical standards to protect participant rights and data integrity. Approved by Yangpu Hospital (IRB #LL-2024-KY-005), the study implemented comprehensive ethical procedures.

Results

This study included 145 PCPs, with 77 % female, 82 % over 30 years old, and 44 % holding a master's degree or higher (Table 1). Their self-reported research capacity in general practice and primary care averaged 2.4, with subdomain scores ranging from "little experience" (2) to "some experience" (3) across 10 subdomains (Fig. 2). Of the 77 participants (53.1 %) willing to participate in qualitative interviews, 24 were interviewed. Details are presented in Table S3.

Among the surveyed PCPs, the percentages who agreed with statements about their research context were: 84.8 % reported a supportive community health centre environment, 68.9 % could integrate research with clinical practice, 66.9 % had easy access to research resources, 60.0 % possessed necessary research resources, 50.3 % could find collaborators, and 42.8 % had sufficient research time.

Qualitative analysis validated and expanded on these findings: (1) Institutional support, though present, focuses on performance metrics rather than broader research initiatives; (2) PCPs integrate research with clinical practice by leveraging personal resources and expertise; (3) Research learning resources, while accessible, often misalign with actual needs; (4) Available research resources are basic, limiting large-scale, rigorous studies; (5) Internal institutional collaboration is feasible, but insufficient professional research support poses a major barrier; (6) Beyond limited research time, fragmentation of time further impedes progress (Table 2).

Table 3 and Table S4 summarizes PCPs preferences for six incentives and their Kano Model classification, with quantitative analysis classifying all as performance attributes (Fig. 3). Qualitative findings, however, revealed discrepancies: (1) "Learning research knowledge and techniques for general practice and primary care" and "addressing personally relevant research questions" were confirmed as performance attributes, requiring systematic skills for independent research and leadership of projects, respectively; (2) "Receiving reasonable financial compensation" was perceived as an indifferent attribute due to insufficient motivation, while "working in a research-supportive environment" was a must-be attribute, its absence reducing willingness and capacity for PBRN research; (3) "Receiving authorship based on contributions" varied—primary authorship was a performance or attractive attribute valued for career progression, but secondary authorship was indifferent, offering minimal recognition; (4) "Access to shared research data" was a performance or attractive attribute for PCPs with aligned research focus and capacity, but indifferent for those lacking conditions to utilize it.

Qualitative results emphasized that trust amongst collaborators is essential for the six incentives to effectively motivate PCPs in PBRN research. Without trust, participants noted, PCPs are unlikely to engage sincerely or to sustain effort in PBRN activities. Repeated failure by the PBRN organizing body or research team to honor commitments may lead PCPs to cease collaboration. Participants highlighted that trust relies on

Table 2
Research environment for primary care practitioners in the Shanghai general practice research network.

Dimension	Mean (SD)	Percentage	Perceptions of primary care practitioners (PCPs)	Quotation	Meta-inference
Integration of research with clinical practice	2.84(0.94)	Not at all 11.03%; Uncertain 20%; Somewhat true 42.76%; Definitely true 26.21%	Most PCPs conduct or are inclined to conduct research aligned with their daily clinical practice, deriving research questions from practical challenges. This alignment enables them to leverage personal experience and theoretical knowledge, utilize existing resources efficiently, and integrate research with routine work, thereby saving time and generating findings that enhance clinical practice and benefit the community.	Participant I5: "*I want my research to come from community work. I'd like to weave it into my daily tasks so they support each other. You can do a lot while working—like during clinic visits, I might think about issues, such as spreading health knowledge when discussing conditions. It strengthens the doctor-patient bond and builds more 'fans,' which is great for PCPs. They feed into each other.*"	Confirmed and extended: Qualitative data corroborates the quantitative finding that most PCPs align research with clinical work and elucidates their motivations for integrating research to enhance practice and community outcomes.
Availability of research time	2.38(0.89)	Not at all 15.86%; Uncertain 41.38%; Somewhat true 31.03%; Definitely true 11.72%	Most PCPs are heavily engaged in clinical care, public health duties, and training during work hours, with emergencies further limiting research time. Nearly all participants conduct research during evenings or weekends, reducing personal leisure and family time. The fragmented and intermittent nature of available research time diminishes efficiency and motivation.	Participant I4: "*GPs and staff are swamped during the day—no time for research. Leaders don't cut your workload for it; everyone gets the same tasks. Research eats into our off-hours. With that kind of pressure, if I'm putting in the time, I need something worthwhile in return.*"	Confirmed & extended: Qualitative data confirms that many PCPs lack sufficient time for research and further reveals how fragmented time impacts efficiency and motivation.
Access to research collaborators	2.55(0.86)	Not at all 9.66%; Uncertain 40%; Somewhat true 35.17%; Definitely true 15.17%	Collaboration patterns vary: some PCPs partner with tertiary hospital teams, others collaborate within their institutions, and some work independently. Teamwork fosters creativity, shares workload, and supports mutual learning. However, nearly all participants report a need for methodological support (e.g., study design, data analysis, writing) but lack institutional mechanisms to access such expertise.	Participant I6: "*I work with two colleagues because data collection isn't a solo job. Our director, a chief physician, didn't need first authorship, so we shared it. But I don't know how to find professional researchers. I'm not close with them, and asking for help feels weird. Still, I need someone who gets study design, stats, and publishing.*"	Confirmed and extended: Qualitative data supports the quantitative finding of varied collaboration practices and highlights the unmet need for accessible methodological expertise.
Access to learning resources for research skills	2.90(0.91)	Not at all 6.90%; Uncertain 26.21%; Somewhat true 36.55%; Definitely true 30.34%	Although various learning resources are available, they often fail to provide systematic, practice-focused, end-to-end training. Self-study online is challenging due to limited foundational knowledge, academic texts are difficult to navigate, conferences emphasize results over practical skills, online courses lack interactive feedback, and offline workshops can be overwhelming.	Participant I17: "*A single lecture doesn't do much. Fixing one small thing doesn't solve the big picture. We've got systemic gaps. Training often misses what I need, and I struggle to use what's taught. Reading research books alone is tough, and conferences don't cover my needs. When I started, I couldn't even guess what skills I'd need.*"	Confirmed and extended: Qualitative findings confirm the quantitative observation of accessible but inadequate learning resources and clarify the barriers to acquiring practical research skills.
Institutional support for research	3.28(0.75)	Not at all 1.38%; Uncertain 13.79%; Somewhat true 39.31%; Definitely true 45.52%	Community health centre leaders generally support research, encouraging grant applications, awards, and facilitating data access and patient recruitment. Some centres invite external experts for training and offer clear incentives (e.g., bonuses, promotion points) for publications and funding. However, despite this supportive environment, many PCPs feel pressure to produce outcomes primarily for institutional prestige rather than scientific advancement.	Participant I2: "*Leaders back research, but it's about cost-benefit. Financially, research in community centres is a loss. They push it to boost rankings and reputation. I used to research for promotion, but now that's less of an issue, I'd rather tackle real problems and hit academic goals.*"	Confirmed and extended: Qualitative data validates the quantitative finding of a supportive institutional research environment while revealing a focus on institutional prestige over scientific contribution.

(*continued on next page*)

Table 2 (*continued*)

Dimension	Mean (SD)	Percentage	Perceptions of primary care practitioners (PCPs)	Quotation	Meta-inference
Availability of research resources	2.68(0.77)	5.52% 13.79% 34.48% 46.21% Not at all Uncertain Somewhat true Definitely true	Most PCPs access Chinese databases (e.g., CNKI, Wanfang) through institutional or personal accounts, but few use international databases. Some secure research grants, but without funding, institutions cover limited publication fees. Clinical and public health data are available, but concerns about public health data quality lead many to prefer self-collected data. Ethical approvals are typically obtained via affiliated tertiary hospitals.	Participant I8: "*We've got CNKI and Wanfang, but not all articles are free to download. I haven't got funding yet, but the district offers decent support—around 90,000 CNY over three years if approved. I collect my own data or use institutional data. Clinical data's fine, but public health data's iffy because of performance-based recording. For patient recruitment, trust is key. If you don't know residents well, you're stuck with your regular patients.*"	Confirmed and extended: Qualitative data confirms the quantitative finding of partial resource access and highlights limitations in international database use, data quality concerns, and reliance on trust for recruitment.

Table 3
Preferences of primary care practitioners for reward types and their kano model classification.

Item	Positive			Negative			Kano classification
	Category	Number(%)	Mean	Category	Number(%)	Mean	
Acquiring knowledge and skills in primary care research	Lack of willingness	1 (0.69 %)	2.73	Still willing	14 (9.66 %)	1.2	Performance
	Uncertain	13 (8.97 %)		Uncertain	49 (33.79 %)		
	Somewhat willing	63 (43.45 %)		Lack of willingness	49 (33.79 %)		
	Very willing	68 (46.90 %)		Very unwilling	33 (22.76 %)		
Receiving authorship based on research contributions	Lack of willingness	1 (0.69 %)	2.73	Still willing	18 (12.41 %)	1.16	Performance
	Uncertain	15 (10.34 %)		Uncertain	55 (37.93 %)		
	Somewhat willing	59 (40.69 %)		Lack of willingness	42 (28.97 %)		
	Very willing	70 (48.28 %)		Very unwilling	30 (20.69 %)		
Access to shared research data	Lack of willingness	1 (0.69 %)	2.68	Still willing	13 (8.97 %)	1.15	Performance
	Uncertain	17 (11.72 %)		Uncertain	61 (42.07 %)		
	Somewhat willing	58 (40.00 %)		Lack of willingness	46 (31.72 %)		
	Very willing	69 (47.59 %)		Very unwilling	25 (17.24 %)		
Receiving fair financial compensation	Lack of willingness	2 (1.38 %)	2.7	Still willing	23 (15.86 %)	0.9	Performance
	Uncertain	15 (10.34 %)		Uncertain	55 (37.93 %)		
	Somewhat willing	58 (40.00 %)		Lack of willingness	46 (31.72 %)		
	Very willing	70 (48.28 %)		Very unwilling	21 (14.48 %)		
Working in a research-supportive environment	Lack of willingness	2 (1.38 %)	2.74	Still willing	13 (8.97 %)	1.31	Performance
	Uncertain	15 (10.34 %)		Uncertain	55 (37.93 %)		
	Somewhat willing	55 (37.93 %)		Lack of willingness	46 (31.72 %)		
	Very willing	73 (50.34 %)		Very unwilling	31 (21.38 %)		
Addressing self-initiated research questions	Lack of willingness	2 (1.38 %)	2.76	Still willing	19 (13.10 %)	0.81	Performance
	Uncertain	14 (9.66 %)		Uncertain	63 (43.45 %)		
	Somewhat willing	56 (38.62 %)		Lack of willingness	48 (33.10 %)		
	Very willing	73 (50.34 %)		Very unwilling	15 (10.34 %)		

the PBRN core team's reputation, credibility, and prior achievements, but more critically on transparent, reliable, and feasible research plans and collaboration protocols.

Discussion

This mixed-methods study, conducted within the SGPRN, offers preliminary insights into the research context of PCPs in Shanghai's PBRN-affiliated community health centres, particularly those engaged in general practice and primary care research. Our findings indicate that PCPs, constrained by limited and fragmented research time, often work independently or in small teams without professional guidance, relying on limited knowledge and clinical experience. Driven by institutional performance incentives, they prioritize tangible outcomes like publications, funding, and awards. Their preferred incentives of research skills acquisition, leading personally relevant studies, securing primary authorship, and accessing shared data, align with their challenges (insufficient expertise) and goals (publication-driven outcomes), with trust among collaborators being essential for motivation.

Building on these findings, the research challenges faced by PCPs in Shanghai's community health centres, such as limited research knowledge, insufficient collaboration with professional researchers, and time constraints from heavy clinical workloads,[13-14,26] mirror those of international counterparts and echo the identified constraints in expertise and time. To address these, innovations from elsewhere provide valuable models: the European General Practice Research Network (EGPRN) offers the European General Practice Research Agenda[27] and online training courses for general practitioners,[28] the North American Primary Care Research Group (NAPCRG) supports a Mentor-Trainee Matching Platform[29] for mentorship, and U.S. PBRN-specific card studies[30,31] enable data contribution with minimal workflow disruption. Since 2019 there have been Chinese initiatives which include research resources from the Chinese General Practice,[32-35] structured training programs, and online discussion groups for GP associations, all supporting PCPs in acquiring research knowledge and conducting studies.

To effectively adapt these strategies, understanding China's primary care research context and its influence on PCPs' motivations is essential. A defining feature is its publication-centered research evaluation sys-

tem, prioritizing one or two primary authors, coupled with performance-based incentives that have spurred numerous PCPs to engage in research, yielding substantial academic output. Bibliometric analyses reveal a sharp rise in primary care and general practice publications in China from 2001 to 2020,[36] reaching 3,122 papers by 2021, this is 1.5 times the U.S. output and three times the U.K.'s in the same period, with nearly 60 % authored by PCPs.[34] These trends position PBRNs as ideal platforms for PCPs seeking collaborative opportunities to enhance research quality and facilitate the implementation of findings, thereby improving patient care and outcomes through structured support.

However, this system also fosters an individualized, small-scale, output-driven research model among PCPs, as evidenced by their emphasis on primary authorship and tangible outcomes in this study. Unlike North American PCPs, motivated by collaborative and practice-oriented PBRN research,[13-16] our system exhibits two overly utilitarian traits: (1) Research is framed as a "funding-to-publication" pipeline for career advancement, sidelining collaborative scientific inquiry and fostering scientific shortcuts, disorganized competition, and potential academic misconduct; (2) Individual career advancement (e.g., publications, awards) which overshadows the fundamental purpose of all primary care research, which is to advance the field of clinical practice, to benefiting patients and society. A national bibliometric analysis of China's primary care research, supported by two methodological quality assessments, revealed that most PCP original research papers were single-authored with weak methodological quality, severely undermining their scientific reliability and evidential value.[34-37]

In this context, the future organizational strategies and research design approaches of PBRNs in China should highlight a guiding principle: to support the evolution of research policies toward more collaborative and impactful primary care research, rather than serving solely as platforms for publication-driven output. Drawing on international experiences,[38-40] PBRNs could lead in strengthening clinical practice, patient care, and the discipline by promoting team-based research that engages PCPs as valued partners. This entails providing PCPs with practice-oriented training to address clinically relevant research questions, shifting focus from metrics emphasizing publication counts or journal impact, and emphasizing authentic, high-quality data to enhance the credibility and practical value of research. Such an approach aligns with PCPs' motivations while fostering sustainable, cooperative research that benefits patients, healthcare professionals, and society.

A limitation of this study is its focus on Shanghai, one of mainland China's provincial administrative units with a robust economy, well-developed primary care system, and abundant research institutions and professional researchers. Additionally, as the SGPRN pre-screened community health centres as part of recruitment, participants were predominantly from centres with stronger research foundations and greater-than-average willingness to engage in primary care research. As a result, PCPs research context and experiences may be more favorable than those in other regions of China. Consequently, the findings primarily represent the perspectives of a "top-tier" segment of PCPs rather than the broader national primary care workforce. To develop more inclusive PBRN organizational models and research strategies, future studies need to investigate similar issues in diverse regions of China, providing a comprehensive understanding of PCPs' research environments and incentive preferences across varied settings.

Conclusion

This study within the SGPRN reveals that community-based primary care practitioners PCPs, limited by time and research expertise, and prioritize publication-driven incentives, valuing transparent, trust-based PBRN participation to achieve tangible outcomes. To advance primary care research in China, future PBRNs could strategically draw on international experiences to develop context-sensitive support systems, providing practice-oriented scientific training and promoting team-based research that emphasizes clinical relevance and robust methodology over narrow publication metrics. By addressing expertise gaps and mitigating unintended policy effects, PBRNs can empower frontline practitioners, foster meaningful practice-based research, and enhance general practice and patient care across diverse settings.

Authors' other information

Not applicable.

Authors' contributions

Conceptualization, Y.W.; Methodology, Y.W; Data curation, Y.W and Y.P; Formal analysis, Y.W.; Funding acquisition, Y.W, H.J, and D.Y; Project administration, H.F; Resources, D.Y; Supervision, D.Y; Validation, Y.W; Writing—original draft, Y.W.; Writing—review and editing, Y.W., P.Y., H.Y, H.S, H.J, and D.Y. All authors have read and agreed to the published version of the manuscript.

Ethical approval and consent to participate

The study received approval from Yangpu Hospital, School of Medicine Tongji University (LL-2024-KY-005).

Consent for publication

Not applicable.

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Declaration of competing interests

W.Y., J.H., Y.H. and Y.D. is editorial member of Chinese General Practice Journal, they are not envolved in the editorial review or the decision to publish this article. All authors declare that there are no competing interests.

Availability of data and materials

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Supplementary materials

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