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The influence of professional identification and organizational incentives on turnover intentions: a hierarchical linear model in Beijing's family doctors

Ziyan Zhai[1], Chengsen Cui[3] and Kai Meng[1,2*]

Abstract

Background The high turnover intentions among family doctos (FDs) in China have impacted the stability of teams and the quality of healthcare services in community health centers (CHCs). The factors influencing FDs' turnover intentions include not only individual characteristics but also organizational environmental factors within CHCs. This study aims to explore the mechanism of the impact of FDs' professional identification and organizational incentives on their turnover intentions.

Methods This study selected 3 397 FDs from 102 CHCs in six districts of Beijing as the research subjects. Multiple scales were used to quantify FDs' professional identity, turnover intention, and organizational incentives. A Hierarchical Linear Model (HLM) was employed to investigate the effects of organizational-level and individual-level factors on turnover intentions and to analyze the interaction between individuals and organizations.

Results The study found that FDs' professional identification has a significant negative impact on turnover intentions (Beta=-0.242, $P<0.001$). The level of organizational incentives in CHCs had a significant negative impact on turnover intentions (Beta=-0.173, $P<0.001$), and the level of organizational incentives played a significant negative moderating role in the process of individual professional identification influencing turnover intentions (Beta = 0.004, $P<0.05$).

Conclusions Enhancing FDs' professional identity can lower their turnover intention, and the impact of personal identity on turnover intention diminishes in institutions with strong organizational incentives. During the training stage of FDs, it is essential to foster a strong personal professional identity value the role of organizational incentives, and optimize the overall organizational environment.

Keywords Family doctor, Turnover intention, Influencing factors, HLM model

*Correspondence:
Kai Meng
mengkai@ccmu.edu.cn
[1]School of Public Health, Capital Medical University, No. 10, Xitoutiao, Youanmenwai Street, Fengtai District, Beijing 10069, China
[2]Beijing Tiantan Hospital, Capital Medical University, No. 119 South Fourth Ring West Road, Fengtai District, Beijing, China
[3]China Center for Health Development Studies, Peking University, No.38 Xueyuan Road, Haidian District, Beijing, China

Background

With an aging population, chronic diseases are the main health concern, for which primary health care is essential. Primary health care's role has evolved from simply controlling diseases to providing comprehensive long-term care, improving patients' quality of life. Strong primary healthcare systems are linked to cost-effective care, health equity, and better population health [1]. The family doctor system, a key policy for achieving universal primary health care as outlined in the Alma-Ata Declaration, has quickly advanced globally [2]. A report by the World Health Organization points out that only 5% of patients require specialized medical care, while more than 90% of health issues can be resolved by professionally trained family doctors (FDs) [3]. FDs focus on holistic, coordinated primary care, addressing patients' personal and environmental factors, and are crucial for managing mental health to ensure quality care [4].Mazza D has pointed out that "there may be no better example of the value of FDs than in managing multiple diseases" [5]. In China, FDs are medical personnel who provide health education, disease prevention, consultation for common illnesses, basic treatment for minor ailments, and guidance on seeking medical care. They implement the first-consultation system to achieve goals like graded diagnosis and treatment, and controlling medical costs. They work in community health centers (CHCs), providing basic medical services or family doctor contracted services, and receive a contracted service fee. The income structure is fixed. Unlike those in foreign countries, Chinese FDs do not open their own clinics and have no income from clinics.

In China, the unbalanced distribution of medical resources is a huge challenge currently faced. In 2003, the Chinese government proposed the family doctor system, aiming to ensure that everyone can benefit from family doctor services and obtain basic medical health care. The "Guiding Opinions on Establishing the General Practitioner System" issued by the State Council in 2011 highlights the service model of first visiting primary care settings, which aids in advancing the hierarchical medical treatment system [6]. In 2016, the central government released an important long-term national strategy, the "Healthy China 2030" plan, in which the family doctor system was recognized as a crucial tool for achieving China's health goals by 2030 [7]. Given that primary care work mostly requires the involvement of FDs as the core, FDs are considered the pivotal point for advancing and implementing family doctor contracting services [8]. However, Chinese scholars such as GAN have discovered that currently, over 70% of FDs express a moderate to high willingness to leave their current positions [9]. Li pointed out that younger FDs exhibit a higher intent to leave, with 80% of FDs under the age of 35 expressing a desire to leave [10]. In China, FDs face ongoing staffing shortages and high rates of turnover intent. This can lead to low morale, hidden absences, poor performance, instability in the family doctor team, and significant impacts on work efficiency and organizational effectiveness [11]. FDs' ongoing desire to leave their jobs threatens healthcare system stability, which hurts residents' health.

Literature review and hypotheses

Many studies have uncovered factors influencing the turnover intention, the factors can be mainly categorized into two aspects. One is at the individual level, where professional identity plays a significant role. Professional identity refers to an individual's understanding of the social impact of their profession and the significance of their work. In previous research, a higher level of professional identity has typically been associated with a lower likelihood of nurses seeking to change careers [12]. Chinese hotel employees found that professional identity hurts the turnover intention [13]. Besides, Mobleyhave found that job aspects like workload and pay are key factors in determining whether someone wants to leave their job [14]. Seston E found that a healthy work-life balance and harmony between work and personal time can influence turnover intentions, with higher intentions seen in jobs that demand quick responses [15].

Secondly, there are factors at the organizational level. A study from central China demonstrated that employees not only compare their work incomes with others to assess the fairness of the organization's pay distribution system but also pay attention to the organization's work incentives. These benefits can reduce the job instability of the employees [16, 17]. Iqbal proposes that autocratic leaders who ignore their subordinates' welfare can cause negative feelings, leading to low energy in completing tasks. Berquist et al. maintain that poor workplace conditions and environments can bring distress and suffering to individuals [18]. The perceived quality of relationships and organizational support in the workplace can influence the frequency of employee sick leave and turnover the organization [19]. Additionally, not enough promotion and development options can lead to employees looking to leave [20]. Related literature also suggests that key factors influencing employees' turnover intentions include organizational systems, ethical climate, fair decision-making processes, job autonomy, and leadership behaviors [21]. The turnover intention of FDs influenced by various organizaitonal incentive factors.

Furthermore, Porter and Lawler's motivation model indicates that people may respond differently to motivational factors based on their individual differences and cognitive perceptions. This means that when organizational incentives impacts FDs, the strength of their turnover intention can vary due to individual differences such

as their personal traits and professional identity.Coetzee and others also found in their research that when nurses actively identify with their careers, the dissatisfaction caused by their work environment can be suppressed to some extent [22]. To uncover the relationship between individual and organizational factors, analysis of whether varying degrees of incentive levels across different organizations may play a moderating role in the process of professional identity influencing turnover intention. This study employs Hierarchical Linear Modeling (HLM) to separate within-group and between-group variations in FDs' turnover intention. The theoretical model of factors influencing FDs' turnover intention is shown in Fig. 1. The hypotheses are proposed:

H1 The professional identity of FDs influences their turnover intention.

H2 The organizational incentives in CHCs affects the turnover intention of FDs.

H3 The organizational incentives in CHCs plays a moderating role in the process by which FDs' professional identity affects their turnover intention.

Methods

Study participants

The study targets FDs as the participants, According to the sample size calculation formula, $n = \frac{\mu^2 \alpha\, p(1-p)}{\delta^2}$, where p=33.9%. This is based on a study in Beijing, China. The study found that 33.9% of FDs in the surveyed CHCs have the turnover intention [23]. The margin of error is δ =0.025, and setting α =0.05 yields μ =1.96. The calculated required sample size is 1373 participants. The research area was confined to six districts out of the 16 in Beijing (Fengtai, Huairou, Mentougou, Miyun, Tongzhou, and Yanqing districts). Considering the diverse geographical environments and economic levels of the CHCS among the sample districts, all operational CHCs in these six districts were selected for the study. A total of 102 CHCs were included, and 40 FDs were randomly selected from each CHC to participate in a questionnaire survey. A total of 4,080 questionnaires were sent out. The inclusion criteria for FDs were: (1) willingness to participate in this study; (2) provision of specific FD services. The exclusion criterion was: FDs who voluntarily withdrew after understanding the informed consent matters. According to the purpose of this study, data with missing values and invalid questionnaires were excluded. To ensure data quality, we excluded questionnaires with response times of less than 130 s. Finally, a total of 3,397 questionnaires were collected, and the response rate was 83.26%. It meets the sample size requirement.

The survey data encompassed various aspects including basic information of FDs, evaluation of organizational incentives levels, personal professional identity, and FDs' turnover intention. Questionnaires were distributed to institutions via the National Health Commission's investigation letter. The survey was conducted with the assistance of the Beijing Community Health Association, and the investigation period was from October to December 2021. We used online software to distribute and collect questionnaires, allowing one response per IP device. All participating FDs signed informed consent forms, ensuring the protection of their personal rights.

Hierarchical linear model (HLM)

HLM was a statistical analysis technique designed for the analysis of data with a hierarchical or nested structure [24]. This study employed the HLM software to conduct parameter estimation using the maximum likelihood estimation method. The basic multilevel model equation is as follows:

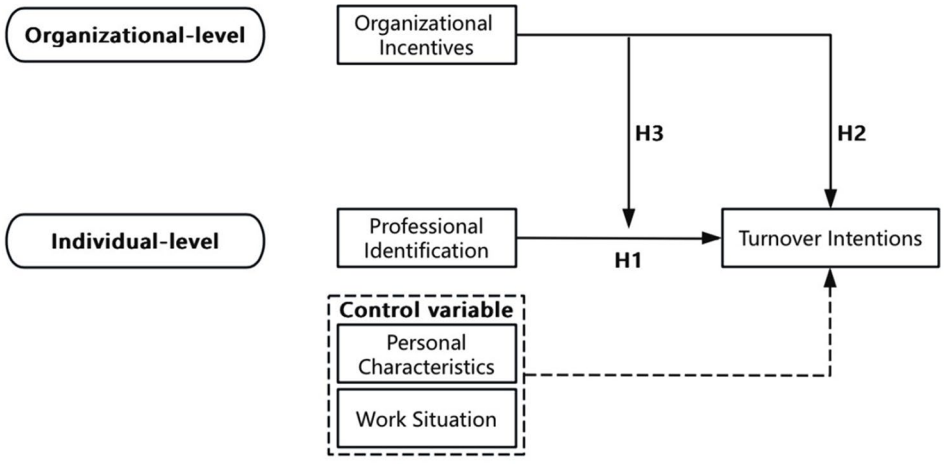

Fig. 1 Theoretical Hypotheses of Factors Affecting FDs' Turnover Intentions

$$level1: Y_{ij} = \beta_{0j} + \beta_{1j}X_{ij} + r_{ij}$$
$$level2: \beta_{0j} = \gamma_{00} + \gamma_{01}W_j + \mu_{0j}$$
$$\beta_{1j} = \gamma_{10} + \gamma_{11}W_j + \mu_{1j}$$

In this context, i denotes a FD and j denotes a CHC. The dependent variable Y_{ij} represents the turnover intention of the i-th FD in the j-th CHC. The individual-level independent variable X_{ij} represents the personal characteristics, work situation, and personal professional identity of the i-th FD from the j-th CHC. The organizational-level independent variable W_j represents the level of organizational incentives of the j-th CHC.

The study constructs four hierarchical linear models with the "FD's turnover intention" as the dependent variable. (1) The Null model is used to test the applicability of the method, with no predictor variables at neither the individual-level nor the organizational-level. (2) The random effects model includes individual-level variables, testing the effects of individual-level variables on the dependent variable. (3) The intercept prediction model, controlling for individual-level variables, adds organizational-level variables only to the intercept term to measure the direct effects of organizations on the average FD's turnover intention. The intercept prediction model considered a special form of the mixed effects model. (4) The mixed effects model explores the impact of the interaction between organizational and individual factors on the differences in FD's turnover intention.

Dependent variables

This study uses FD turnover intention as the dependent variable, measured by a scale developed by scholars Michael and Spector [25]. Chinese scholars Li Dongrong and Li Jingyuan have translated and revised this scale for use among Chinese employees [26]. These dimensions and items include the likelihood of resigning from the current job (2 items), the motivation to seek other job opportunities (2 items), and the possibility of obtaining external job positions (2 items). Higher scores indicate a stronger turnover intention. Through exploratory factor analysis (EFA), The KMO value was 0.943 and the Bartlett's sphericity test value was 70,069.586 with $P<0.001$. The cumulative explanation ratio of the three factors was 78.25%, and Cronbach's alpha was 0.954. Confirmatory factor analysis (CFA) results showed that the RMSEA was 0.025 (<0.1), CFI was 0.999 (>0.9), TLI was 0.997 (>0.9), and SRMR was 0.005 (<0.05), indicating good reliability and validity.

Individual-level independent variables

This study incorporates individual-level variables include three parts: individual characteristics (Gender, Age, Education), work situation (Professional title, Years of medical work, Average monthly income, Working hours per week), and professional identity. In the evaluation of professional identity, based on the professional identity scale developed by Chen Jing [27]. Dimension 1 is career treatment (5 items) and Dimension 2 is professional competence (8 items). The career treatment dimension reflects individuals' perceptions and evaluations of the material and spiritual rewards from their professions, covering economic compensation, welfare, work environment, and interpersonal relationships. The professional competence dimension focuses on the personal capabilities and professional identity. It represents the comprehensive quality and practical abilities individuals demonstrate in their careers (Supplementary file 1: Professional Identity Scale) Each item in the scale uses the Likert 5-point scoring method. Higher scores indicate a better professional identity among FDs. EFA showed a KMO of 0.938 and a Bartlett's test value of 46,177.277 with $P<0.001$, and a Cronbach's alpha of 0.950. CFA results indicated an RMSEA of 0.084 (<0.1), a CFI of 0.963 (>0.9), a TLI of 0.945 (>0.9), and an SRMR of 0.050 (<0.05), suggesting good reliability and validity.

Organization-level independent variables

The organizational Incentives variable was measured using a self-developed scale evaluating family doctor incentives based on the AMO model (Supplementary file 2: Scale of Organizational Incentives Level for Family Doctors). The scale consists of 9 items for work value, 6 for organizational environment, 2 for personal development, and 3 for reward and compensation. It covers both hygiene and motivational factors. FD motivation in primary care was assessed through self-evaluation, using a Likert 5-point scale. Higher scores reflect greater organizational incentives. EFA showed a KMO of 0.977 and a Bartlett's test value of 94,089.783 with $P<0.001$. The three factors explained 86.05% of the variance, with a Cronbach's alpha of 0.981. CFA results indicated an RMSEA of 0.069 (<0.1), a CFI of 0.932 (>0.9), a TLI of 0.919 (>0.9), and an SRMR of 0.048 (<0.05), suggesting good reliability and validity.

For specific descriptions of the related variables, please refer to Table 1.

Since the organizational incentives was obtained from the scores of individual FDs, it is necessary to use the average of all individual evaluation results as the measure of its observation. This requires arguments from both within-group homogeneity and between-group differences (Kozlowski & Klein, 2000; Zohar, 2000) [28]. To assess within-group homogeneity: The rwg over 0.9 indicating very high consistency. The ICC(1) value reflects within-group consistency, usually being above 0.5, while the ICC(2) value reflects between-group consistency, also typically above 0.5. The results found an rwg of 0.961, an ICC(1) of 0.087, and an ICC(2) of 0.761 for homogeneity

Table 1 Descriptions of variables

Level	Variables	Descriptions
Level-1	1. Gender	Male = 1, Female = 0
	2. Age	≤ 30 = 1, 31–40 = 2, 41–50 = 3, ≥ 51 = 4
	3. Education	High school or below = 1, Junior college = 2, Undergraduate = 3, Master's degree or above = 4
	4. Professional title	No title = 1, Primary title = 2, Middle title = 3, Vice-senior title = 4, Senior title = 5
	5. Years of medical work (years)	≤ 10 = 1, 11–20 = 2, 21–30 = 3, ≥31 = 4
	6. Average monthly income (yuan)	3000 = 1, 3001–6000 = 2, 6001–9000 = 3, 9001–12,000 = 4, above 12,001 = 5
	7. Working hours per week (hours)	≤ 40 = 1, 41–50 = 2, 51–60 = 3, ≥61 = 4
	8. Professional identification	Continuous variable
	9. Turnover intentions	Continuous variable
Level-2	10. Organizational incentives	Continuous variable

within groups. For intergroup differences, a one-way ANOVA to analyze whether the level of organizational incentives was different in different organizations. The results revealed an F-value of 4.175 and $P < 0.001$. It is reasonable to use the average score of individual ratings to represent the organizational incentives level score.

Common method biases

Due to the fact that this study obtained data through a single-source self-reporting method by FDs. Therefore, it is necessary to determine whether this bias would have a significant impact on the validity of the research results. Harman's one-factor test for common method bias was employed by conducting an EFA of all the scales involved in the study together. If the variance explained by the largest factor is less than 40% or 50%, and there is more than one factor with an eigenvalue greater than 1, it indicates that there is no serious common method bias in the study [29]. The results showed that the variance explained by the largest factor was 31.38%, and there were a total of 4 factors with eigenvalues greater than 1, indicating that there is no significant common method bias issue in this study.

Results

Characterization and correlation of variables

Among the 3397 FDs surveyed, The majority of the surveyed FDs were female, with most aged 31–40 and holding undergraduate degrees. They mostly had primary titles and worked between 41 and 50 h weekly. The proportion of FDs with over 10 years of medical work exceeds one-half, and the average monthly income was around 6001–9000 yuan. The data was analyzed using descriptive statistics and correlation analysis, with means, standard deviations, and correlations presented in Table 2. Professional identity, turnover intention and organizational incentives are related.

Construction and results analysis of the null model

The null model analysis results revealed that the between-group variance of 1.640 was statistically significant, with obvious layered characteristics (see Table 3). The intra-class correlation coefficient ICC (1) was 1.64/(1.64 + 24.5 5) = 1.64/26.19 = 0.0626; ICC (2) was 0.638, which meets the HLM model requirement that ICC (1) > 0.059 and ICC (2) > 0.5 [30]. The HLM model can be employed for analysis.

Construction and results analysis of the random effects model

The random effects model incorporates variables individual factors. After group centering the professional identity, it is included in the model (refer to Table 4). The fixed effects show that with the increase of age and average monthly income, the turnover intention decreases. Male have higher turnover intention than female, and the turnover intention increases with the increase of education level, professional title and working hours per week. The higher the level of professional identity, the lower the turnover intention, verifying the validity of Hypothesis H1. Since professional identity is significant in the variance of random effects, it is considered that this variable varies between organizations, allowing for the exploration of the moderating effects of organizational factors on it.

Construction and results analysis of the mixed effects model

The intercept prediction model is a special type of mixed effects model, thus this section presents the fixed effects results of both models combined. The intercept prediction model includes the aforementioned variables and centers the organizational-level independent variable, the organizational incentives, through grand centering before including it in the model analysis (refer to Table 5). The fixed effects show that the level of Organizational incentives has a significant negative impact on the turnover intention. The increase in organizational incentives will lead to the decline of turnover intention. The results verify Research Hypothesis H2. Building on the intercept prediction model, the mixed effects model estimates the cross-level interaction between organizational incentives and individual professional identity (refer to Table 5). The level of organizational incentives has a significant negative moderating effect on the relationship between professional identity and the turnover intention. Research

Table 2 Characterization and correlation matrix of all variables

Variables	Min	Max	Ave	Sd	1	2	3	4	5	6	7	8	9	10
1.Gender	0	1	0.24	0.42	1									
2.Age	1	4	2.22	0.99	0.028	1								
3.Education	1	4	2.54	0.77	-0.101***	-0.390***	1							
4.Professional title	1	5	2.40	0.80	-0.077***	0.278***	0.316***	1						
5.Years of medical work	1	4	1.88	0.96	0.033	0.759***	-0.318***	0.335***	1					
6.Average monthly income	1	5	2.83	0.87	-0.006	-0.040*	0.377***	0.430***	0.098***	1				
7.Working hours per week	1	4	2.13	0.90	0.131***	-0.021	0.057***	0.035*	0.042*	0.075***	1			
8.Professional identification	13	65	48.80	9.91	0.021	-0.050**	-0.119***	-0.143***	-0.056**	-0.123***	-0.126***	1		
9.Turnover intentions	6	24	10.51	5.10	0.058***	-0.074***	0.160***	0.085***	-0.069***	0.013	0.113***	-0.478***	1	
10.Organizational incentives	20	100	75.39	16.09	0.005	-0.081***	-0.086***	-0.114***	-0.074***	-0.071***	-0.128***	0.807***	-0.479***	1

Note: * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table 3 Results of the null model on the influencing factors of the FD's turnover intention

Random Effect	SD	Variance	DF	χ^2	*P*
Average turnover intention(U0)	1.281	1.640	101	313.52	< 0.001
Level-1(R)	4.954	24.546			

Table 4 Results of the random effects model on the influencing factors of the FD's turnover intention

Variable	Fixed Effect		Random Effect	
	Coefficient	SE	Variance	SD
intercept	9.947***	0.517	6.459**	2.541
Professional identification	-0.242***	0.010	0.004**	0.064
Gender	0.995***	0.193	0.769	0.877
Age	-0.353**	0.118	0.054	0.233
Education	0.552***	0.138	0.431	0.657
Professional title	0.437**	0.157	0.826**	0.909
Years of medical work	-0.183	0.119	0.056	0.236
Average monthly income	-0.518**	0.130	0.483	0.695
Working hours per week	0.255**	0.090	0.146	0.382

Note: * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table 5 Results of the intercept prediction model and mixed effects model on the influencing factors of the FD's turnover intention

Variable	Intercept Prediction Model		Mixed Effects Model	
	Coefficient	SE	Coefficient	SE
intercept	10.129***	0.486	10.157***	0.486
Organizational incentives	-0.168***	0.018	-0.173***	0.019
Professional identification	-0.241***	0.010	-0.242***	0.010
Professional identification*Organizational incentives	-	-	0.004*	0.002
Gender	0.952***	0.196	0.961***	0.194
Age	-0.336**	0.116	-0.332**	0.117
Education	0.548***	0.137	0.543***	0.137
Professional title	0.391*	0.155	0.390*	0.155
Years of medical work	-0.198	0.121	-0.201	0.123
Average monthly income	-0.519***	0.123	-0.525***	0.123
Working hours per week	0.228*	0.093	0.226*	0.093

Note: * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Hypothesis H3 is supported and holds true. That is to say, the professional identity of FDs in CHCs with higher organizational incentives will weaken the impact on turnover intention. In the mixed effects model, The impact of individual professional identity on turnover intention (B = -0.242, $P<0.001$) is greater than that of incentive level (B = -0.173, $P<0.001$).

Discussion

This study conducted a questionnaire survey among 3 397 FDs from 102 CHCs in Beijing. The results revealed that the FD's turnover intention is influenced by a combination of individual and organizational factors. Both

individual professional identity and organizational incentives have inhibitory effects on the turnover intention. In particular, professional identity has played an important role. The organizational incentives moderates the process of how individual professional identity affects the turnover intention.

Previous research, especially in nursing, has often identified professional identity as a key factor affecting turnover intentions. This study supports that finding in the context of Fellow Doctors, showing that as professional identity strengthens, the turnover intention decreases, confirming the study's initial hypothesis. When employees have a positive perception of their own careers, on one hand, they will invest more energy and enthusiasm in their work. This helps individuals successfully establish a positive self-schema involving professional-related activities [31]. On the other hand, scholars have found that employees' personal professional identity is closely related to their mental health. Employees with higher mental health often have a strong sense of self-efficacy, which can lead to academic success and future work benefits, potentially decreasing turnover [32]. Professional identity should be given significant attention, as Samantha and others directly propose that "the formation of professional identity is a key aspect of medical internship education" [33]. Most scholars believe that the cultivation of professional identity does not only derive from organizational behavior and individual thoughts, but it is largely initially formed during the stages of education and learning. Therefore, efforts to enhance and cultivate professional identity should commence from educational institutions [34]. In the training program, cultivating a strong professional identity should be a core objective, strengthen initial education, ensuring content and activities effectively enhance family doctors' recognition and passion for their profession. Increase the emphasis on professional identity related courses, such as ethics, competence, and industry trends. Use diverse training methods like case analysis, role playing, and group discussions to boost interactivity, participation, and learning outcomes.

The model has effectively validated the role of organizational-level factors in influencing the turnover intention in this study. Organizational incentives have a significant negative impact on the turnover intention. In practice, incentives are about fostering employee enthusiasm to increase their work efficiency. Organizational incentive levels measure how well an organization motivates its employees to be proactive, reflecting the actual incentives the organization offers. In this study, the incentive factors were composed of four dimensions: job value, organizational environment, reward and compensation, and personal development. Previous research has shown that the fairness of salary distribution systems and the nature of organizational rewards can impact employees' job stability [16, 17]. Leadership style within organizations, the ethical climate, fair decision-making, job autonomy, interpersonal relationships, and opportunities for promotion also influence the turnover intention [21, 35]. It is apparent that the FD's turnover intention is a complex outcome influenced by multiple incentive factors.

We found that organizational incentives levels mitigate the impact of professional identity on the turnover intention. Past research has shown that a poor organizational environment can exacerbate work-related stress and lead to negative mental health outcomes, but conversely, a positive organizational environment can act as a facilitator, improving mental health, as well as job satisfaction and efficiency [36]. Under such conditions, even if the professional identity level of FDs is low, it will not excessively exacerbate their turnover intention. This demonstrates new characteristics and attributes emerging from the interaction of personal factors and environmental factors for FDs. The organization plays a multifaceted role in an individual's turnover intention, not only directly affecting the employee's turnover intention but also moderating the effectiveness of professional identity. If a positive organizational incentives can be fostered, it will have a significant impact on the stability of the FD team. Leadership is a crucial factor affecting the organizational environment, and excellent leaders have a positive influence on employees' leadership behaviors [37]. Organizations should establish an effective talent selection and management system. Given the rapid social development and changes in contemporary Chinese society, it is necessary to develop more leadership training and development programs that align with societal progress. The organization's compensation system should be competitive, aligning with external market rates to ensure fairness for healthcare professionals [38]. Most studies have found that activity-based payment plans (such as Fee-for-Service, FFS) are associated with increased output activities [39, 40]. Optimizing a sound compensation system is of paramount importance for FD's future development. Furthermore, FDs face a lack of opportunities for promotion and career advancement. They require professional guidance and career advice during their personal development, and also desire support from colleagues in terms of assistance and partnership [41]. The key to career development lies in establishing relationships with others who have the potential to assist in career advancement [42]. Therefore, we suggest that organizations should provide FDs with development channels and offer some necessary relational support.

Additionally, the nature of the job cannot help but influence the turnover intention. The effort invested and the income earned by FDs in their work influence their turnover intention. This study found that

the longer th working hours per week or the lower the average monthly income, the greater the FDs' turnover intention. The impact of both factors on the turnover intention is roughly the same. In regions with poorer economic development, income has a strong influence on the turnover intention. A rural survey found that FDs in low-wage rural areas have not been treated as well as veterinary doctors, and some have even switched to veterinary work [43]. This exacerbates the issues in regions with unbalanced development. Employees who gain greater control over their working hours and flexibility are less likely to leave [44]. An excessive clinical workload can lead to burnout [45]. This is due to the increased frequency of work leading to an increased likelihood of insomnia [46]. When the professional titles is not granted due to the employee's lack of work experience, the turnover intention is significantly higher [47]. It is observed that the turnover intention actually increases with the advancement of their professional titles, an opposite phenomenon that may be attributed to the difference in the workplace between nurses and FDs. In China, FDs usually work at CHCs, where they have fewer chances for advancement and lower social status compared to nurses in big hospitals. As FDs are promoted, they are more likely to want to work in larger hospitals, leading to higher turnover intention as their titles improve. Therefore, the author suggests that we should pay attention to the balance between working hours and income. For the issue of psychological imbalance caused by professional titles, organizations should offer development platforms for FDs.

The most significant factor among individual characteristics is the issue of gender. The turnover intention for males is higher than for females, suggesting a gender difference in turnover tendency. In Asia, where family and childcare are still largely women's responsibility, this may lead women to prioritize a stable professional income over investing more in job advancement, reducing their likelihood of job switching [48]. Education level has a significant positive effect on turnover intention for FDs, as supported by research since 2006 by Lamber and colleagues [49]. Additionally, a study by Algazlan and scholars on Saudi pharmacists found that higher education is linked to higher turnover intention [50]. For FDs working in CHCs, the importance of personal development is influenced by the choice of profession. Especially for those FDs who have pursued and obtained higher education, the importance of personal development is more significant. FDs with higher education will choose higher-level medical institutions instead of CHCs, which provide a broader development platform. Previous studies have emphasized the importance of "equal pay for equal work". However, the results of this study provide some additional suggestions: the government and related health organizations should pay attention to the differences between men and women in social responsibility and provide corresponding welfare subsidies. FDs' educational levels should be adapted to their current work and future development. Variables like individual characteristics and work situation can not only analyze their impact on the result variable but also control for potential confounding variables. This helps better understand the relationship between professional identity, organizational incentives, and turnover intention.

China's healthcare system is reforming to boost service quality and efficiency, covering personnel training and management optimization. Though centrally managed, the system actively seeks improvements. The 3rd Plenary Session of the 20th CPC Central Committee proposed deepening the medical and health system reform, with salary reform as a key task. The national leader stressed implementing the "Two Allowances", letting medical institutions exceed current public institution wage control levels and use part of their medical service income, after cost deduction and fund extraction, mainly for personnel rewards. This policy grants medical institutions significant autonomy in salary incentives, allowing flexible adjustments to their own needs. The study's findings and recommendations will offer theoretical references for higher authorities, primary healthcare institutions, and other scholars.

Limitations and future research

However, our study may still have some limitations. Firstly, the questionnaire survey on FDs was conducted only in Beijing, China, and does not reflect the national context. Future research will involve a larger, more diverse sample. Secondly, since we used cross-sectional data to study FDs' current turnover intentions, it's hard to capture temporal changes. Longitudinal research in the future could provide a more direct and effective approach. Furthermore, as China's economy evolves, the reasons why FDs want to leave may grow more varied. We've only looked at some organizational macro factors. Future research should include social environmental factors to develop a three-level HLM model. It is hoped that our research findings will contribute to further studies on the transformation of turnover intention into actual leaving behavior, with a focus on the stability of FD teams.

Conclusions

Professional identity has a greater impact than organizational incentives in reducing turnover intention. The strength of organizational incentives mitigates the influence of professional identity on turnover intention, revealing new characteristics from the interplay of personal and organizational factors. When training family doctors, strengthen initial education, increase content

on professional identity cultivation through case sharing, team building activities, etc., to enhance their professional identity and passion. CHCs should consider FD specific working conditions, tailor work to individual strengths, offer promotion opportunities, establish a competitive incentive system, cultivate effective leaders, and create a positive environment for FDs.

Abbreviations

FDs	Family Doctors
CHCs	Community Health Centers
HLM	Hierarchical Linear Model
EFA	Exploratory Factor Analysis
CFA	Confirmatory Factor Analysis

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12875-025-02859-1.

Supplementary Material 1

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Author contributions
CSC contributed to the questionnaire design and investigation. ZYZ contributed to the data curation, software, formal analysis and writing of the original draft. KM contributed to conceptualization, methodology, writing-review, and editing, supervision, project administration, funding acquisition. All the authors read and approved the final manuscript.

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Data availability
The datasets generated and analyzed during the current study are available from the corresponding author on reasonable request. E-mail: mengkai@ccmu.edu.cn.

Declarations

Ethics approval and consent to participate
This study was conducted in accordance with the principles of the Declaration of Helsinki. This study is based on a research study approved by the ethics committee of Capital Medical University (NO. Z2021SY015 and NO. Z2021SY016). Informed written consent was obtained from all the participants before the start of this study. By completing a consent form, the participants were informed about the purpose and method of the study. The participants were also informed that the researchers were committed to answering their questions and that their information would be kept confidential.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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