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Influence of Effort-Reward Imbalance of Primary Medical Staff on Performance Management Reform: A Cross-Sectional Study

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Abstract

Objective: To explore the impact of the Effort-Reward Imbalance of medical staff in primary medical institutions on the performance management reform, and to analyze the influencing factors of the performance management reform in primary medical institutions. Methods: Using the Effort-Reward Imbalance scale and the performance management questionnaire of primary medical institutions compiled by the research group, 1084 medical staff from 30 primary medical institutions in Anhui Province, China were investigated, using descriptive statistical analysis and logistic regression methods. Results: The Effort-Reward Imbalance of medical staff in primary medical institutions was 0.93 ± 0.38, of which 38.19% were in the state of high effort-low reward, 61.81% were in the state of low effort-high reward, and 88.1% supported the performance management reform. Logistic regression results showed that gender, working life, authorized strength and effort-reward ratio were the influencing factors of the performance management reform of primary medical institutions ($P < 0.05$). Conclusion: The performance management reform of primary medical institutions should consider the gender of medical staff, working life, authorized strength and the status of effort-reward.

Keywords

Primary Medical Staff; Effort-Reward Imbalance; Performance Management.

1. Introduction

The report of the 19th National Congress of the Communist Party of China put forward the implementation of the healthy China strategy, and the most important measure is to strengthen the construction of the primary medical and health service system, from which it can be seen that the success or failure of the construction of the primary medical and health service system directly affects the smooth implementation of the healthy China strategy. The construction of primary medical and health service system should not only include the construction of primary medical and health service institutions, the transformation of the operation mechanism and service mode of primary medical and health service institutions, but also cover the construction of primary medical health staff[1]. It is not difficult to see that the acquisition, development, motivation, maintenance and research of human resources in primary medical and health service institutions are quite important. Under the current conditions, the primary medical staff not only undertake the basic medical tasks, but also undertake a large number of public health services. Their perception of the current job environment and treatment plays a significant role in the construction of the primary medical and health service system.

Experts and scholars give different explanations for what performance management is. Aguins states that performance management is an ongoing process of identifying, measuring and developing individual performance and team performance and making performance

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improvement according to organizational strategy[2]. Noe argues that performance management refers to the process by which managers ensure that employees' job activities and job outputs are consistent with organizational goals, and it is the central link for enterprises to win competitive advantages[3]. Another asserts that performance management refers to the process of, in order to achieve organizational goals, promoting goal-conducive behaviors among teams and individuals through continuous and open communication, thereby generating the benefits and outcomes desired by the organization[4]. From the above definition, it can be seen that performance management is a management system that undertakes vision and strategy under the guidance of organizational mission and core values. It is a closed-loop system with continuous improvement consisting of performance planning, monitoring, evaluation and feedback.

The performance management of primary medical institutions is an important starting point to strengthen the construction of primary medical and health service system and improve the enthusiasm of medical staff[5]. There are many factors affecting the performance management reform, which different scholars have expounded from different angles, such as Zhu from the perspective of stakeholders, it is considered that the interests of patients, the interests of medical staff, hospital governance model and competitors and the fierce competition in the industry are the influencing factors of the performance reform of public hospitals[6]. Guo from the perspective of enterprise management, the factors that affect the performance management reform are corporate culture and development strategy, enterprise structure and management control, position management system, budget accounting system and target management, and salary management system[7].

Proposed by psychologist Siegrist, Effort-Reward Imbalance model, abbreviated as ERI model,is a combination of environmental and personal factors to explain psychological problems, including effort, reward and overload three parts, it emphasizes the relationship between work and reward, pointing out that the significance of work is to get the corresponding remuneration[8]. If there is no corresponding remuneration for the labor, that is, in the case of Effort-Reward Imbalance, the attendance rate, participation rate, job satisfaction rate and performance of the staff will be reduced. Turnover intentions, job burnout and absenteeism will increase[9].

The Effort-Reward Imbalance (ERI) model has been widely applied in occupational health research among healthcare professionals. Existing studies have demonstrated that ERI is negatively associated with job satisfaction[10-11], positively associated with burnout[12-13], and impairs job performance[14]. Regarding policy support, Ouyang et al. found that ERI was negatively correlated with community health workers' support for the hierarchical medical system reform, with job satisfaction serving as a mediator[15]. International qualitative evidence also confirms that primary care physicians commonly experience high-effort–low-reward distress[16].

However, most prior research has focused on the effects of ERI on health or attitudes, leaving the direct relationship between ERI and support for performance management reform largely unexplored. As a core institutional arrangement influencing the motivation of healthcare professionals, the successful implementation of performance management reform heavily depends on the recognition and support of its target group. Therefore, this study aims to investigate the effect of ERI on primary healthcare professionals' support for performance management reform and to analyze its underlying mechanisms, thereby filling the gap in the existing literature.

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2. Methods

2.1. Survey Instrument

A questionnaire survey was conducted. The main contents of the questionnaire were as follows: (1) Demographic and professional characteristics of primary medical staff, including gender, age, marital status, working life, educational status, professional titles, authorized strength, and position; (2) Attitude towards the performance management reform of primary medical institutions, using the Likert 5-level scoring method (1 = Strongly agree, 2 = Agree, 3 = Neutral, 4 = Disagree, 5 = Strongly disagree) (3) Effort-Reward Imbalance scale (ERI scale), the scale was developed by the psychologist Siegrist, including three dimensions: effort, reward and overcommitment, a total of 23 items. There are six effort items, eleven reward items, six overcommitment items, effort and reward items using the five scoring method, 1 is strongly disagree, 2 is disagree, 3 is neutral, 4 is agree, 5 is strongly agree; overcommitment using four scoring method, 1 is strongly disagree, 2 is disagree, 3 is agree, 4 is strongly agree. To determine the presence of effort-reward imbalance, the scale employs the ratio of effort to reward, expressed as $E/(R \times C)$, where E represents the effort score, R represents the reward score, and C is a correction constant set at 0.545. A value of 1 serves as the cutoff point between balance and imbalance. A computed value of less than 1 indicates that effort is less than reward (balanced), whereas a value greater than 1 indicates that effort exceeds reward, signifying a state of effort-reward imbalance.

2.2. Setting and Participants

In this study, using convenient sampling method, from June to August 2024, 30 primary medical institutions in Anhui province were selected. The staff of these institutions filled in the questionnaire, when this survey was conducted, the authors' institution had not yet established a formally constituted ethics committee. Therefore, the study protocol was approved by the head of each participating institution, and verbal informed consent was obtained from all participants prior to their enrollment. A total of 1200 questionnaires were distributed and 1084 valid questionnaires were collected, with an effective rate of 90.3%.

2.3. Statistical Analysis

Statistical analyses were performed using STATA version 15. Descriptive statistics were used to summarize participants' demographic characteristics, Effort-Reward Imbalance ratio, and attitudes toward performance management reform. Continuous variables were expressed as means ± standard deviations (SD), and categorical variables as frequencies and percentages.

To identify factors associated with support for performance management reform (binary outcome: support vs. non-support), binary logistic regression analysis was employed. This method is appropriate because the dependent variable was dichotomous and the aim was to estimate adjusted odds ratios (ORs) for multiple independent variables simultaneously, including demographic characteristics and ERI status.

The ERI was calculated using the standard formula $E/(R \times C)$, where $C = 0.545$. Based on previous validation studies, an ERI > 1 indicates a high-effort–low-reward state, and ERI < 1 indicates a low-effort–high-reward state. For logistic regression, ERI was treated as a binary variable (≥1 vs. <1) following the theoretical cutoff of the model.

Categorical variables were dummy-coded as indicated in Table 1. All independent variables were entered into the regression model using the enter method. A two-tailed $P < 0.05$ was considered statistically significant. No severe multicollinearity was detected among the independent variables (variance inflation factor < 2 for all variables).

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3. Results

Table 1. General characteristics of primary medical staff in Anhui Province (n = 1084)

Variables / Code	N (%)	Mean ± SD
Sex		
Male = 1	164 (15.13)	
Female = 2	920 (84.87)	
Age (year)		38.02 ± 8.94
≤30 = 1	236 (21.77)	
30-50 = 2	732 (67.53)	
≥50 = 3	116 (10.70)	
Marital status		
Unmarried = 1	169 (15.59)	
Married = 2	915 (84.41)	
Working life (year)		16.14 ± 9.76
≤10 = 1	428 (39.48)	
10-20 = 2	269 (24.82)	
≥20 = 3	387 (35.70)	
Educational status		
Junior college and below = 1	334 (30.81)	
Undergraduate = 2	648 (59.78)	
Master's degree or above = 3	102 (9.41)	
Professional titles		
Primary = 1	461 (42.53)	
Intermediate = 2	488 (45.02)	
Associate senior and above = 3	58 (5.35)	
Other = 4	77 (7.10)	
Authorized strength		
Permanent staff = 1	939 (86.62)	
Non-permanent staff = 2	145 (13.38)	
Position		
Physician = 1	456 (42.07)	
Nurse = 2	252 (23.25)	
Medical technician = 3	182 (16.79)	
Executive staff = 4	106 (9.78)	
Rear service and others = 5	88 (8.12)	
ERI ratio		0.93 ± 0.38
ERI≥1 = 1	414 (38.19)	
ERI<1 = 2	670 (61.81)	
Effort score		17.68 ± 5.63
Reward score		36.82 ± 7.19
Performance management reform attitude		
Support = 1	955 (88.1)	

ERI = effort-reward imbalance

Among the subjects surveyed, 164 were male and 920 were female, with a mean age of 38 ± 8.94 years and a mean working life of 16.14 ± 9.76 years. The most common educational level was an undergraduate degree.The number of people with primary and intermediate

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professional titles was relatively large. From the point of view of authorized strength, more for the Permanent staff. In terms of position categories, there were 456 physicians and 252 nurses. The total effort score of primary medical staff was 17.68 ± 5.63, the total reward score was 36.82 ± 7.19, and the ERI value was 0.93 ± 0.38 (Table 1). Among the primary medical staff, 61.81% (670 individuals) had an ERI < 1, indicating a state of low effort and high reward. 3.04% (33 individuals) had an ERI = 1, indicating a balanced state, and 35.15% (381 individuals) had an ERI > 1, indicating a state of high effort and low reward, i.e., effort-reward imbalance.

Of the 1,084 primary medical staff, 738 (68.08%) expressed strong or general support for the performance management reform, and 217 (20.02%) were uncertain. In light of the practical context and established academic conventions, the present study categorized those who were "uncertain" as supportive. Thus, the overall supportive rate for the performance management reform was 88.1%, while 129 participants (11.9%) opposed it (Figure 1).

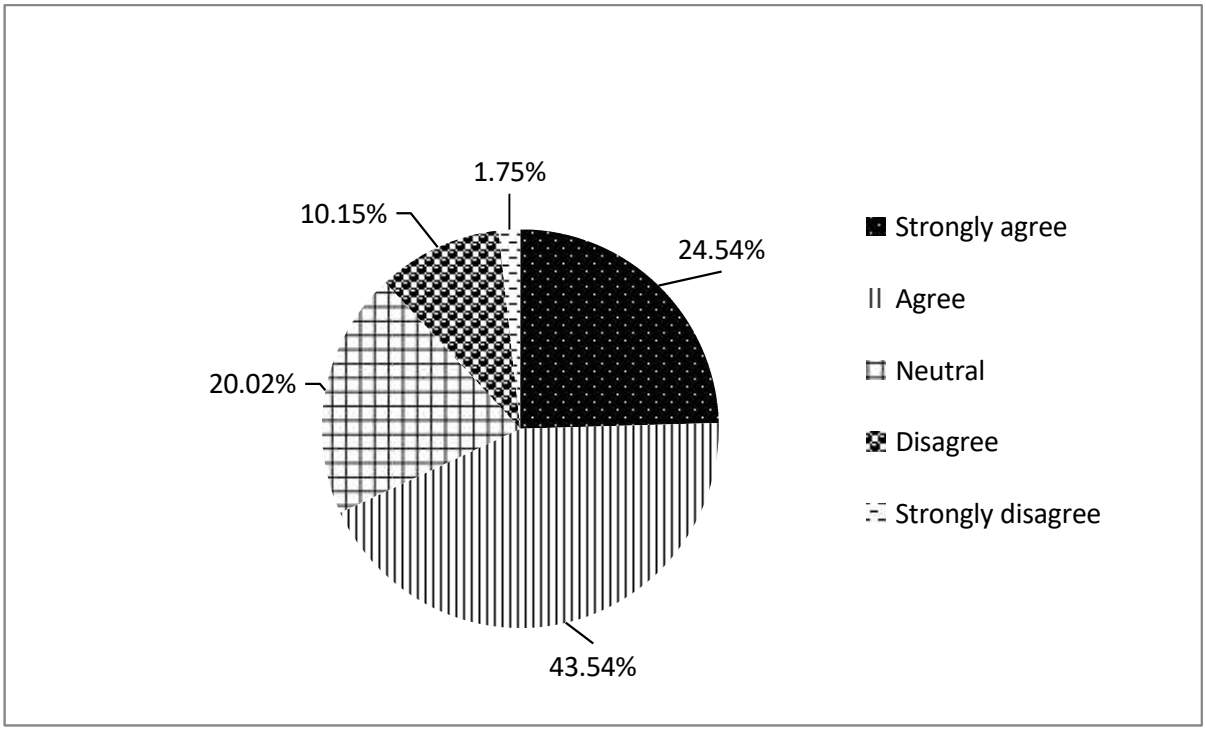

Figure 1. Attitude of primary medical institutions in implementing performance management reform

Taking the attitude towards performance management reform as the dependent variable, and the basic characteristics of primary medical staff (with categorical variables set as dummy variables) along with the ERI value as independent variables, a binary logistic regression analysis was conducted to identify predictors. Gender was coded with male as the reference; age with ≤30 years as the reference; marital status with unmarried as the reference; working life with ≤10 years as the reference; educational status with junior college and below as the reference; professional title with primary level as the reference; authorized strength with permanent staff as the reference; position with physician as the reference; and ERI value with ≥1 as the reference. The variable assignment is presented in Table 1.

The results showed that gender, working life, authorized strength and effort-reward ratio were the influencing factors of the performance management reform ($P < 0.05$) (Table 2).

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Table 2. Results of the multivariate analysis of factors influencing the reform of performance management in primary healthcare institutions

Variables	OR (95% CI)	*P* value
Gender		
Woman	0.39 (0.20,0.80)	.009*
Age		
30-50	0.75 (0.41,1.37)	.343
≥50	1.13 (0.40,3.24)	.816
Marital status		
Married	0.84 (0.47,1.52)	.561
Working life		
10-20	2.21 (1.23,3.96)	.008*
≥20	2.61 (1.38,4.92)	.003*
Educational status		
Undergraduate	1.25 (0.77,2.02)	.369
Master's degree or above	1.81 (0.75,4.38)	.186
Professional titles		
Intermediate	2.84 (0.62,13.06)	.180
Associate senior and above	0.55 (0.23,1.30)	.170
Authorized strength		
Non-permanent staff	2.56 (1.21,5.44)	.014*
Position		
Nurse	0.70 (0.42,1.17)	.174
Medical technician	1.20 (0.66,2.16)	.555
Executive staff、rear service	1.39 (0.60,3.18)	.441
Other	1.33 (0.53,3.29)	.545
ERI		
<1	2.44 (1.66,3.59)	＜.001*

ERI = effort-reward imbalance

*P** < .05

4. Discussion

4.1. Status of Effort-Reward Imbalance of Primary Medical Staff

The survey revealed that the ERI value of primary medical staff was 0.93 ± 0.38. A total of 35.15% of primary medical staff had an ERI > 1, indicating that this group was in a high-effort, low-reward state, while the remaining 64.85% had an ERI < 1, indicating a low-effort, high-reward state. The Logistic regression showed that, compared with high effort-low reward medical staff, medical staff in a state of low effort-high reward were more inclined to reform the current performance management. This finding may be attributed to differences in cognitive attitudes between the two groups. Medical staff with an ERI < 1 demonstrated greater professional identification and held more positive attitudes toward the various activities undertaken by primary medical institutions. In contrast, those with an ERI > 1 perceived the current appraisal system of primary medical institutions as unfair and unreasonable. Furthermore, previous reforms in primary medical institutions had increased their workload without a corresponding increase in rewards. Consequently, performance management reform was viewed as "an ineffective effort to revive a hopeless situation," accompanied by concerns that workload would further increase and the gap between effort and reward would widen. As a result, this group

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naturally held a negative attitude toward performance management reform. Additionally, during the data collection process, it was found that the current performance management and appraisal systems of various primary medical institutions may also have certain deficiencies. Performance appraisal was not aligned with job responsibilities, medical risks, or work intensity. The distribution of performance bonuses rarely followed the principle of "greater reward for greater effort," resulting in essentially equal bonuses regardless of the amount of work performed. As a consequence, the motivation of diligent workers was undermined. Moreover, due to the cap on the total bonus amount in primary medical institutions, the increase in workload was not directly linked to bonus adjustments. In light of this, first, policy promotion should be strengthened to make it clear that performance management reform is an inevitable trend and an institutional arrangement that truly realizes "greater reward for greater effort." At the same time, during the implementation of performance management reform, extensive conditions should be created to achieve fairness, justice, and full participation of all personnel. Second, under the current situation where primary medical institutions implement the separation of revenue and expenditure, the government may grant certain discretionary power over the revenue of primary medical institutions to be used for bonus distribution, so as to mobilize the motivation of healthcare workers to a greater extent. Third, egalitarianism should be eliminated in bonus distribution. This egalitarian model tends to "nurture the idle," resulting in low motivation among healthcare workers, impeded work drive, and low work efficiency[17]. The work of physicians differs from that of general public institutions; therefore, a one-size-fits-all approach should not be adopted in distribution. Instead, the labor value of different physicians should be fully reflected, and distribution should be appropriately tilted toward those with heavy workloads, high risks, and high effort[18].

4.2. Impact of Gender of Medical Staff on Performance Management Reform

Logistic regression showed that women's support for performance management reform was 0.394 times that of men. [OR = 0.394, 95%CI (0.195, 0.796)], indicating that men support performance management reform more than women. In the interview of the comprehensive questionnaire, the reasons for this may be as follows: first, male medical staff play the leading role of the family in the current family structure in China, who hope to improve the performance reward through the performance management reform. Second, men have stronger willingness or desire to accept new things than women[19]. Although the performance management reform is not something new, it is full of uncertainty in the process of reform, which is contrary to the traditional Chinese society that women are undisciplined. For both men and women, their expectations and concerns are only related to whether the performance management reform can actually be implemented. For males, expectations are high; however, if the implementation of performance management reform becomes perfunctory, it will ultimately fail to achieve its intended effect. For females, if the reform can ensure that effort leads to reward, then their support for performance management reform is only a matter of time.

4.3. Impact of Medical Staff's Working Years on Performance Management Reform

The working life of medical staff has a positive prediction effect on the support of performance management reform, that is, the longer the medical staff is, the more they support the reform. The longer the medical staff is, the higher the loyalty and commitment to the organization, plus the medical staff with a longer working life their ability to adapt to the new environment is worse compared with the young people, the combined effect of many aspects makes them more willing to stay in the original organization[20]. The original intention of performance management reform is to achieve "greater reward for greater effort, better reward for better effort, and no reward for no effort", optimize the management of primary medical institutions, make primary medical institutions have stronger competitiveness and development ability,

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these intentions coincide with the hopes of long working life medical staff, which may make them more agree with performance management reform. Furthermore, among medical staff with less than 10 years of working experience, who accounted for 39.48% of the total survey population, a portion consisted of personnel recruited in recent years in Anhui Province, China, as part of the effort to strengthen primary healthcare. These individuals held master's degrees or higher and initially expected to realize their personal value in primary care settings by leveraging their educational advantages. However, during the course of their work, factors such as working conditions, salary and benefits, personal development, interpersonal relationships, and social support in primary medical institutions fell short of expectations. As a result, feelings of underutilization of their skills and an inability to demonstrate their expected value may have emerged, leading to skepticism toward various institutional arrangements within primary medical institutions[21]. In summary, an institutional arrangement must take into account its scientific rationality. On the premise of scientific rationality, its fairness and incentive effects should be realized. Healthcare workers with longer working years exhibit a high degree of attachment to primary healthcare institutions. This attachment should not be regarded as an inevitability but rather transformed into a lubricant that facilitates the advancement of performance management reform. At the same time, career development planning for medical staff with shorter working years should be well established, and attention should be given to the cultivation of young, highly educated talent, so that they are willing to stay and can be retained.

4.4. Impact of Authorized Strength of Medical Staff on Performance Management Reform

According to the survey, 145 primary healthcare workers were non-permanent staff, accounting for 13.38% of the total respondents. In the surveyed primary medical institutions, non-permanent staff and permanent staff performed essentially the same work but received different remuneration. On an annual average basis, the performance bonuses of permanent staff were substantially higher than those of non-permanent staff. This phenomenon may lead to low job satisfaction among non-permanent staff[22]. Under such circumstances, it is understandable that non-permanent staff hope to narrow the bonus gap with permanent staff through performance management reform in primary medical institutions. Performance-based pay is a wage system based on the effective assessment of employee performance, linking performance pay to assessment results[23]. For primary medical institutions, the essence of performance-based pay is to link wages with the quantity, quality, and satisfaction level of services provided. Only in this way can the work motivation of healthcare workers in primary medical institutions be mobilized. In response to the aforementioned problems existing in primary medical institutions, this study suggests that leaders of primary medical institutions should frequently communicate with employed non-permanent healthcare workers, understand their ideological dynamics, and address various difficulties in their lives and work to the greatest extent possible. Equal pay for equal work should be implemented as much as possible in terms of salary and benefits, and standardized labor contracts should be signed. Every effort should be made to consider their practical difficulties and provide the maximum possible support, thereby fundamentally resolving their concerns and enabling them to dedicate themselves to service in primary medical institutions. Only by doing so can primary medical institutions retain their personnel, and only then can new breakthroughs be achieved in the performance management reform of primary medical institutions.

4.5. Comparison with Related Studies

This study found that the ERI imbalance rate among primary healthcare workers was 35.15%, which is slightly lower than the 67.47% rate reported among medical staff in Beijing[24], and also lower than the average level reported for primary healthcare samples by Fan et al[14]. This

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discrepancy may be attributable to sample heterogeneity: the proportion of permanent staff in this study was as high as 86.62%, and permanent employment status is typically associated with higher job stability and remuneration security. Furthermore, the "Strengthening Primary Healthcare" policy implemented in Anhui Province in recent years may have improved the working conditions and salary packages of primary healthcare workers to some extent.

Regarding the influence of ERI on organizational attitudes, the findings of this study both align with and diverge from existing research. Fan et al. demonstrated that ERI affects job performance through the chain mediating roles of perceived organizational support and psychological resilience[14]. Li et al. confirmed that ERI is an important source of job stress[24]. Collectively, these studies point to a core conclusion: ERI is a key factor influencing healthcare workers' work attitudes and behaviors. However, in contrast to the above studies, the present study found that ERI is negatively associated with support for performance management reform; that is, healthcare workers in a low effort high reward state were more inclined to support reform. Although this finding appears counterintuitive at first glance (as one might expect "disadvantaged" individuals to be more supportive of change), possible explanations, informed by in-depth interview data, include the following: the low effort high reward state may reflect workers' dissatisfaction with the current system and their expectation of change, whereas the high effort low reward state implies that workers "have already invested too much without receiving commensurate returns," rendering them defensive toward any reform that might further increase their workload.

Moreover, the influencing factors identified in this study (gender, years of working experience, and employment status (permanent vs. non-staff)) have been rarely systematically explored in existing ERI literature[25-26]. Zhong et al. found that working hours and overcommitment were the primary predictors of ERI among emergency department nurses, but their study did not address employment status as a context specific variable in China[25]. The findings of this study suggest that in the specific context of Chinese primary healthcare institutions, institutional factors (such as employment status) exert a significant influence on healthcare workers' attitudes toward reform, independent of ERI. This provides a new analytical dimension for understanding the acceptance of organizational change in the Chinese context.

The findings of this study should be considered in light of the limitations inherent in the cross-sectional study design. The results are based on questionnaire surveys conducted in Anhui Province, China. Given that healthcare reform policies vary across different regions in China, the conclusions of this study may not be generalizable to large-scale populations. To the best of available knowledge, no study has yet been conducted in China to analyze the relationship between effort–reward imbalance among healthcare workers in primary medical institutions and performance management reform.

5. Conclusion

The reform of performance management in primary medical institutions is a complex systematic project. The factors that affect the smooth implementation of performance management reform may be both the macro policies of the country and the primary medical institutions themselves. However, as the target group of performance management reform, medical personnel are always an unavoidable hurdle. Therefore, it is necessary to pay attention to the characteristics and feelings of medical personnel and their participation in the process of performance management reform.

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