

Identifying the Components of Patient Registration Team Effectiveness: An Exploratory Factor Analysis at Mahasarakham Provincial Hospital

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ABSTRACT

Patient registration is a critical entry point in hospital service delivery, directly influencing service efficiency, continuity of care, and patient satisfaction. Despite its importance, limited empirical evidence is available regarding the organizational factors that contribute to the effectiveness of patient registration teams in provincial hospitals. This study aimed (i) to identify the components of patient registration team effectiveness in the General Administration Division of Mahasarakham Provincial Hospital and (ii) to propose guidelines for improving team performance based on quantitative and qualitative findings. A mixed-methods study was conducted using a sequential explanatory design. Quantitative data were collected from 278 personnel using a 50-item questionnaire. The instrument demonstrated excellent internal consistency (Cronbach's $\alpha = 0.983$). Exploratory Factor Analysis (EFA) was performed to identify the underlying components of team performance. The suitability of the data for factor analysis was confirmed by the Kaiser–Meyer–Olkin (KMO) measure and Bartlett's Test of Sphericity. Qualitative data were obtained through in-depth interviews with key informants and analyzed using thematic analysis to complement and explain the quantitative findings. The quantitative analysis identified five components of patient registration team effectiveness: (i) team structure and staff competency, (ii) management system and staff motivation, (iii) patient registration process and operational efficiency, (iv) performance evaluation and feedback system, and (v) organizational support and health information systems. These five components explained 74.4% of the total variance, indicating a robust factor structure. The KMO value and Bartlett's Test of Sphericity confirmed the appropriateness of the data for factor analysis. Qualitative findings supported these components and highlighted the importance of continuous competency development, effective communication, leadership support, standardized work processes, and integrated health information systems. Based on these findings, practical guidelines were proposed, including staff capacity building, strengthening performance management systems, improving workflow efficiency, establishing continuous feedback mechanisms, and enhancing information technology support. Patient registration team effectiveness is determined by five interrelated organizational components. The qualitative findings reinforced the quantitative results and informed practical improvement strategies. These findings provide an empirical basis for hospital administrators to strengthen patient registration services through integrated organizational, managerial, and technological development.

Keywords: Team performance effectiveness; Patient registration team; Provincial hospital

Introduction

The healthcare system plays a crucial role in improving the quality of life of the population, particularly through provincial and regional hospitals that provide tertiary-level services for a large number of patients with complex medical conditions [1]. The

healthcare service process begins with patient registration, which serves as the entry point to medical care [2]. An effective registration process can reduce waiting time, enhance the accuracy of patient information, and improve overall patient satisfaction with hospital services [3].

Patient registration is a key responsibility within the General Administration Division of hospitals [4]. The registration team is responsible for patient admission, data entry, verification of healthcare coverage, and coordination with various departments within the hospital [5]. The accuracy and efficiency of these processes directly affect the continuity of care, patient safety, and the overall effectiveness of the healthcare delivery system [6]. Inefficient registration procedures may lead to data errors, service delays, and patient dissatisfaction.

In the context of provincial hospitals, where the volume of patients is high and the diversity of healthcare coverage schemes is significant, the complexity of patient registration processes increases [7]. Registration teams must therefore possess professional competence, communication skills, teamwork abilities, and proficiency in information systems to ensure accurate, timely, and standardized operations.

However, a review of the literature indicates that research on the effectiveness of patient registration team performance in provincial hospitals remains limited [8]. Most studies have focused on overall service quality or patient satisfaction rather than internal team factors that influence operational effectiveness [9]. Therefore, examining the effectiveness of patient registration teams is important both theoretically and practically, as it can provide insights into the key components influencing team performance and offer guidelines for organizational improvement [10].

Maharakham Provincial Hospital serves as the primary healthcare provider in the province and surrounding areas [11]. Studying the effectiveness of the patient registration team within this context can help administrators identify factors affecting service efficiency and develop strategies to improve accuracy, speed, and responsiveness to patient needs [12].

For these reasons, the study on the effectiveness of patient registration team performance in the General Administration Division of Maharakham Provincial Hospital is significant for improving healthcare service quality and may serve as a reference for the development of patient registration systems in other hospitals.

Methods

Research design

This study employed a quantitative cross-sectional survey design to identify the components of the effectiveness of patient registration team performance in the General Administration Division of Maharakham Provincial Hospital.

Population and sample

The target population consisted of all personnel working in the patient registration team of the

General Administration Division at Maharakham Provincial Hospital. The sample size was determined based on the recommendation of Hair et al. for Exploratory Factor Analysis, which suggests a minimum of 5–10 participants per observed variable and at least 200 participants. With 50 observed variables, a sample of 278 participants was considered adequate.

Purposive sampling was employed because only personnel directly responsible for patient registration possessed the knowledge and experience required to evaluate the effectiveness of team performance.

Inclusion criteria

Personnel currently assigned to patient registration duties. At least six months of work experience in the registration unit. Willingness to participate in the study.

Exclusion criteria

Personnel on leave during the data collection period. Incomplete questionnaire responses.

Research instrument

Data were collected using a structured questionnaire developed from an extensive review of the literature, organizational management theories, team effectiveness concepts, and previous studies related to patient registration services and healthcare management. The questionnaire consisted of two sections. Demographic characteristics of respondents and fifty items measuring the effectiveness of patient registration team performance using a five-point Likert scale covering five conceptual domains: team structure and staff competency, management system and staff motivation, patient registration process and operational efficiency, performance evaluation and feedback system, and organizational support and health information systems.

Content validity was evaluated by three experts comprising a hospital administration specialist, a healthcare management specialist, and a research methodology expert. The questionnaire was subsequently revised according to their recommendations. Internal consistency reliability was assessed using Cronbach's alpha coefficient, yielding an overall reliability coefficient of 0.98.

Data collection

Eligible participants were contacted through the head of the General Administration Division. After receiving information about the study and providing informed consent, participants completed the questionnaire either in paper format or through an online survey. Data collection was conducted between

Data analysis

Data were analyzed using statistical software. Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to summarize participant characteristics. The suitability of the data for factor analysis was assessed using the Kaiser–Meyer–Olkin (KMO) measure and Bartlett's Test of Sphericity. Exploratory Factor Analysis (EFA) with principal component extraction and Varimax rotation was performed to identify the underlying components of patient registration team performance effectiveness.

Results

The objective of this study was to identify the components of the effectiveness of patient registration

team performance in the General Administration Division of Mahasarakham Provincial Hospital. Exploratory Factor Analysis (EFA) identified five components that explained 74.340% of the total variance (Table 1). The extracted components consisted of: (1) Team Structure and Staff Competency, (2) Management System and Staff Motivation, (3) Patient Registration Process and Operational Efficiency, (4) Performance Evaluation and Feedback System, and (5) Organizational Support and Health Information Systems.

The five extracted components together explained approximately 73.99% of the total variance (Table 1).

Table 1 Summary of the extracted components of patient registration team performance effectiveness

Component	Description	Eigenvalue	Variance explained (%)
I	Team structure and staff competency	7.75	15.61
II	Management system and staff motivation	7.50	15.11
III	Patient registration process and operational efficiency	7.43	15.07
IV	Performance evaluation and feedback system	7.21	14.54
V	Organizational support and health information systems	6.76	13.64
Total	Five extracted components	36.67	73.99

Component I, team structure and staff competency, consisted of ten items with factor loadings ranging from 0.60 to 0.72, indicating that all items were strongly associated with this component. The highest factor loading was A02: Staff possesses knowledge related to patient registration procedures (0.72), followed by A09: Staff shows teamwork and cooperation (0.71) and A06: Staff can handle complex registration cases effectively (0.70). This component had an eigenvalue of 7.75 and explained 15.61% of the total variance (Table 2).

Table 2 Factor loadings for component I: Team structure and staff competency

Item	Statement	Factor loading
1	The patient registration team has diverse professional backgrounds	0.66
2	Staff possess knowledge related to patient registration procedures	0.72
3	Staff regularly attend professional training and seminars	0.67
4	Staff have sufficient experience in patient registration tasks	0.60
5	Staff have good communication and interpersonal skills	0.66
6	Staff can handle complex registration cases effectively	0.70
7	Staff demonstrate problem-solving and innovative thinking	0.61
8	The team supports staff career development	0.70
9	Staff show teamwork and cooperation	0.71
10	The team has sufficient resources to perform registration tasks	0.70

Note. Factor loadings ranged from 0.60 to 0.72. Component I had an eigenvalue of 7.76 and explained 15.61% of the total variance.

Component II, management system and staff motivation, comprised ten items with factor loadings ranging from 0.65 to 0.77, indicating that all items were strongly associated with this component. The highest factor loading was B09: There is a clear staff development plan (0.77), followed by B02: management communicates regularly with staff (0.76) and B10: management regularly reviews and improves the system (0.74). These findings indicate that staff development, effective communication, continuous management improvement, and fair motivational systems are important dimensions of the effectiveness of patient registration team performance. This component had an eigenvalue of 7.60 and explained 15.21% of the total variance (Table 3).

Table 3 Factor loadings for component II: Management system and staff motivation

Item	Statement	Factor loading
1	The management system of the registration team is clear	0.70
2	Management communicates regularly with staff	0.76
3	There is a fair and transparent incentive system	0.73
4	Staff believe incentives reflect their work value	0.65
5	Management adjusts policies based on staff feedback	0.70
6	The team encourages innovation and self-learning	0.73
7	Staff are satisfied with the management system	0.71
8	Incentives increase staff motivation and loyalty	0.72
9	There is a clear staff development plan	0.77
10	Management regularly reviews and improves the system	0.74

Note. Factor loadings ranged from 0.652 to 0.770. Component 2 had an eigenvalue of 7.603 and explained 15.217% of the total variance

Component III, patient registration process and operational efficiency, comprised ten items with factor loadings ranging from 0.65 to 0.76, indicating that all items were strongly associated with this component. The highest factor loading was C10: There is a follow-up and quality-checking mechanism (0.76), followed by C02: The registration process is fast and accurate (0.73) and C05: The process ensures fairness and equal service for all patients (0.73). These findings indicate that an effective patient registration team is characterized by standardized and efficient work processes, continuous quality improvement, timely task completion, interdepartmental communication, and quality assurance mechanisms. This component had an eigenvalue of 7.53 and explained 15.07% of the total variance (Table 4).

Table 4 Factor loadings for component III: Patient registration process and operational efficiency

Item	Statement	Factor loading
1	The registration process is clear and standardized	0.67
2	The registration process is fast and accurate	0.73
3	The team regularly evaluates and improves the registration process	0.71
4	Staff have sufficient knowledge of registration procedures	0.65
5	The registration process ensures fairness and equal service for all patients	0.73
6	Registration tasks are completed within the required time	0.72
7	New staff can quickly adapt to the registration workflow	0.70
8	The team communicates effectively with other hospital departments	0.72
9	The registration process supports the hospital's service goals	0.68
10	There is a follow-up and quality assurance mechanism for the registration process	0.76

Note. Factor loadings ranged from 0.65 to 0.76. Component III had an eigenvalue of 7.53 and explained 15.07% of the total variance.

Component IV, the performance evaluation and feedback system, comprised ten items with factor loadings ranging from 0.65 to 0.78, indicating that all items were strongly associated with this component. The highest factor loadings were D06: The evaluation process is transparent and unbiased (0.78) and D08: There is a performance improvement plan (0.78), followed by D03: Staff understand the evaluation criteria (0.76) and D09: Staff receives timely feedback on performance (0.76). These findings indicate that a transparent and systematic performance evaluation process, together with clear evaluation criteria, timely feedback, and continuous performance improvement, constitutes an important component of the effectiveness of patient registration team performance. This component had an eigenvalue of 7.31 and explained 14.64% of the total variance (Table 5).

Table 5 Factor loadings for component IV: Performance evaluation and feedback system

Item	Statement	Factor loading
1	Performance standards are clear and fair	0.70
2	Performance evaluations are conducted regularly	0.75
3	Staff understand the performance evaluation criteria	0.76
4	Evaluation results are used to improve performance	0.71
5	Staff are encouraged to provide feedback to one another	0.65
6	The performance evaluation process is transparent and unbiased	0.78
7	Evaluation results enhance staff motivation and job satisfaction	0.75
8	There is a performance improvement plan for staff	0.78
9	Staff receive timely feedback on their performance	0.76
10	Performance evaluation contributes to improved teamwork and work performance	0.67

Note. Factor loadings ranged from 0.65 to 0.78. Component IV had an eigenvalue of 7.31 and explained 14.64% of the total variance.

Component V, organizational support and health information systems, comprised ten items with factor loadings ranging from 0.65 to 0.75, indicating that all items were strongly associated with this component. The highest factor loading was E09: Registration information systems are regularly updated (0.75), followed by E10: The team maintains communication with patients and stakeholders (0.74) and E06: The team uses innovative service methods (0.74). These findings indicate that organizational support, effective communication, the adoption of innovative service practices, and well-maintained health information systems are essential components of the effectiveness of patient registration team performance. This component had an eigenvalue of 6.86 and explained 13.74% of the total variance.

Table 6 Factor loadings for component V: Organizational support and health information systems

Item	Statement	Factor loading
1	The team monitors policy and environmental changes	0.68
2	The team can adapt to organizational changes	0.65
3	Staff understand service demands and patient needs	0.72
4	The team communicates effectively with other hospital units	0.68
5	Service strategies are adjusted when necessary	0.66
6	The team uses innovative service methods	0.74
7	Staff understand hospital service policies	0.68
8	There is a crisis or incident response system	0.70
9	Registration information systems are regularly updated	0.75
10	The team maintains communication with patients and stakeholders	0.74

Note. Factor loadings ranged from 0.65 to 0.75. Component V had an eigenvalue of 6.86 and explained 13.74% of the total variance.

The exploratory factor analysis identified five components representing the effectiveness of patient registration team performance in the General Administration Division of Mahasarakham Provincial Hospital. Together, these five components accounted for 74.44% of the total variance, indicating that the extracted factor structure adequately explained the underlying dimensions of team performance effectiveness. The identified components were: (I) Team Structure and Staff Competency, (II) Management System and Staff Motivation, (III) Patient Registration Process and Operational Efficiency, (IV) Performance Evaluation and Feedback System, and (V) Organizational Support and Health Information Systems. Among these, Team Structure and Staff Competency explained the largest proportion of the variance (15.71%), followed by Management System and Staff Motivation (15.21%), Patient Registration Process and Operational Efficiency (15.07%), Performance Evaluation and Feedback System (14.64%), and Organizational Support and Health Information Systems (13.74%) (Table 7).

Table 7 Summary of the five extracted components of patient registration team performance effectiveness

Component	Extracted component	Eigenvalue	Variance explained (%)
I	Team structure and staff competency	7.75	15.61
II	Management system and staff motivation	7.60	15.21
III	Patient registration process and operational efficiency	7.43	15.07
IV	Performance evaluation and feedback system	7.31	14.64
V	Organizational support and health information systems	6.86	13.74
Total variance explained			73.99

Note. The exploratory factor analysis identified five components underlying the effectiveness of patient registration team performance. These five components collectively explained 73.99% of the total variance.

Discussion

The findings of this study identified five components underlying the effectiveness of patient registration team performance in the General Administration Division of Mahasarakham Provincial Hospital: (1) team structure and staff competency, (2) management system and staff motivation, (3) patient registration process and operational efficiency, (4) performance evaluation and feedback system, and (5) organizational support and health information systems. These five components explained 73.99% of the total variance, indicating that the extracted factor structure adequately represented the dimensions of patient registration team performance effectiveness.

The first component, team structure and staff competency, reflects the importance of employees' knowledge, skills, experience, communication abilities, and teamwork in supporting effective registration services. This finding is consistent with Human Resource Management Theory, which emphasizes that employee competency development and appropriate workforce management are essential factors contributing to organizational performance and service quality. Previous studies have also highlighted that healthcare personnel competency influences service efficiency and patient-centered care.

The second component, management system and staff motivation, indicates that effective management structures, communication, staff development opportunities, and fair incentive systems are important factors related to team performance. This finding supports motivation theories, which suggest that recognition, career development, and supportive

leadership can enhance employee motivation and commitment. In healthcare organizations, management practices that promote staff engagement may contribute to improved service performance.

The third component, patient registration process and operational efficiency, emphasizes the importance of standardized procedures, accuracy, timeliness, and quality control mechanisms. Patient registration is the initial process of healthcare service delivery; therefore, efficient registration workflows can reduce delays, improve information accuracy, and support better patient experiences. Previous studies have similarly reported that improving registration procedures and health information management contributes to increased operational efficiency in hospitals.

The fourth component, performance evaluation and feedback system, demonstrates the importance of transparent evaluation criteria, regular assessment, and constructive feedback. These mechanisms allow staff to recognize performance strengths and identify areas requiring improvement. Consistent evaluation systems may support continuous learning and teamwork development within patient registration units.

The fifth component, organizational support and health information systems, highlights the role of organizational resources, communication systems, technological support, and information management in improving registration team performance. Effective health information systems can enhance data accuracy, service coordination, and operational efficiency.

Regarding instrument reliability, this study found a high Cronbach's alpha coefficient (0.98). Although a very high alpha value may indicate potential similarity

among some items, the items in this study were developed from relevant concepts and covered multiple dimensions of team performance effectiveness. Furthermore, the EFA results demonstrated a meaningful five-component structure, suggesting that the items represented distinct dimensions of the construct.

This study has several limitations. First, the participants were recruited from a single provincial hospital, which may limit the generalizability of the findings to other healthcare settings. Second, the use of self-reported questionnaires may have introduced response bias. Future studies should examine these components in multiple hospitals and consider additional research designs to further validate the findings.

Conclusions

This study identified five components of patient registration team performance effectiveness in the General Administration Division of Mahasarakham Provincial Hospital: (I) team structure and staff competency, (II) management system and staff motivation, (III) patient registration process and operational efficiency, (IV) performance evaluation and feedback system, and (V) organizational support and health information systems. These components represent important dimensions contributing to effective patient registration team performance.

The findings suggest that hospitals should consider these components when assessing and improving patient registration services, particularly in relation to staff competency development, management practices, workflow improvement, performance evaluation, and information system support. Further studies in different hospital contexts are recommended to examine whether these components are applicable across various healthcare organizations.

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