Original Research Article

A Study of Patient Relationship Management in Continuum of Care: A Case Study in Government Hospitals of Chhattisgarh

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Abstract

This research investigates the role of Patient Relationship Management (PRM) in enhancing patient satisfaction in government hospitals of Chhattisgarh, India, emphasizing the contributions of Information Technology (IT) and the Continuum of Care (CoC). A quantitative research design was employed, collecting data from 440 patients across district hospitals, community health centers, and medical colleges using a structured questionnaire adapted from validated scales (PAM, SERVQUAL, PSQ-18). Descriptive statistics indicated that 59.3% of respondents were aged 25-34 years, with 69.2% female. Inferential analyses, including Chi-square tests (χ^2=18.92, $p<0.01$), t-tests ($p>0.05$ for gender), ANOVA (F=4.62, $p<0.01$), Pearson correlations (loyalty: r=0.631; trust: r=0.598; IT: r=0.453), and regression analysis (R^2=0.532, β for IT=0.312, $p<0.01$), confirmed significant relationships between PRM, IT, CoC, and patient satisfaction. IT was a strong predictor of satisfaction (β=0.586, $p<0.01$), explaining 34.2% of the variance, and structured care plans significantly enhanced outcomes (χ^2=18.92, $p<0.01$). The findings highlight the need for integrating advanced IT solutions (e.g., Electronic Health Records, telemedicine) and structured CoC plans to improve patient experiences and health outcomes in public healthcare settings, particularly for younger and rural populations. Policy implications include investing in IT infrastructure and CoC frameworks to advance universal healthcare goals in resource-constrained environments.
Keywords: Patient Relationship Management, Continuum of Care, Public Healthcare, Information Technology, Patient Satisfaction, Health Management Information System.

1. INTRODUCTION

The global healthcare sector is undergoing a transformative shift toward patient-centered care, driven by rising patient expectations, technological advancements, and increasing competition among healthcare providers. Patient Relationship Management (PRM), a strategic framework adapted from Customer Relationship Management (CRM), focuses on acquiring, developing, and maintaining effective patient-provider interactions by leveraging data across clinical and service functions (Rouse, 2008). In resource-constrained public healthcare systems, such as those in Chhattisgarh, India, PRM is critical for enhancing patient satisfaction, loyalty, and care quality, thereby supporting the goal of universal healthcare coverage.

Chhattisgarh, a state with over 25 million people, predominantly rural, faces significant healthcare challenges, including limited infrastructure, geographic barriers, and high patient volumes in government hospitals. These facilities often struggle with patient satisfaction due to long wait times, poor communication, and fragmented care delivery. Information Technology (IT), through tools like Electronic Health Records (EHRs), patient portals, and telemedicine, offers solutions to improve communication, efficiency, and accessibility (Taghavifard *et al*., 2020). Similarly, the Continuum of Care (CoC), an integrated system guiding patients through various care levels, is essential for managing chronic conditions like hypertension and diabetes, which are prevalent in the region (Evashwick, 1989).

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This study examines how PRM, IT, and CoC interact to enhance patient satisfaction in Chhattisgarh's government hospitals, addressing a critical gap in understanding their application in public healthcare settings. The research objectives are:

1. To evaluate the role of PRM in enhancing patient satisfaction.
2. To assess the impact of IT on patient satisfaction.
3. To explore the relationship between CoC and patient satisfaction.
4. To investigate the role of healthcare technology in supporting both patient satisfaction and CoC.

The study tests four hypotheses:

- **H1**: PRM significantly impacts patient satisfaction.
- **H2**: IT significantly enhances patient satisfaction.
- **H3**: There is a significant relationship between CoC and patient satisfaction.
- **H4**: Healthcare technology significantly impacts both patient satisfaction and CoC.

2. LITERATURE REVIEW

The literature review synthesizes global and Indian studies on PRM, CoC, patient satisfaction, IT, and patient retention, providing a robust theoretical foundation for the study. It contextualizes the research within Chhattisgarh's public healthcare challenges and global healthcare trends.

2.1 Patient Relationship Management (PRM)

PRM is a strategic framework that leverages patient data to enhance engagement, satisfaction, and care quality. Vardasca and Martins (2011) describe PRM as a healthcare adaptation of CRM, emphasizing centralized data management to improve care coordination and patient empowerment. PRM involves collecting and analyzing data on health complaints, diagnoses, and preferences to deliver personalized care and foster shared decision-making (Chhangani, 2013). In Chhattisgarh's government hospitals, PRM is vital for managing high patient volumes and ensuring equitable care, particularly for rural populations (Mohiuddin, 2019).

Globally, PRM has transformed healthcare delivery. Gaynor (2015) notes that PRM reduces transaction costs and enhances the lifetime value of patient-provider relationships, a model successfully implemented in developed healthcare systems like the United States and Europe. In India, Chhangani (2013) highlights PRM's adoption in private hospitals, but its application in public hospitals remains underexplored due to resource constraints and systemic challenges. This study bridges this gap by examining PRM's feasibility in Chhattisgarh's public healthcare context.

PRM's benefits include improved patient loyalty, reduced care redundancy, and enhanced communication. However, challenges such as limited IT infrastructure and low digital literacy among patients pose barriers, particularly in rural areas (Mohiuddin, 2019). Addressing these requires tailored PRM strategies that integrate IT and focus on patient-centered care.

2.2 Continuum of Care (CoC)

CoC is an integrated health system that guides patients through various care levels, ensuring services match their needs while optimizing resource efficiency (Evashwick, 1989). CoC is critical for chronic disease management, a growing concern in Chhattisgarh due to rising rates of diabetes, hypertension, and cardiovascular diseases. Haggerty *et al*. (2003) identify three CoC dimensions:

- **Informational Continuity**: Seamless data sharing across providers.
- **Relational Continuity**: Consistent provider relationships.
- **Management Continuity**: Coordinated care plans.

Freeman *et al*. (2007) emphasize that CoC reduces care fragmentation, enhances patient retention, and improves health outcomes. In India, CoC is underdeveloped in public hospitals due to fragmented healthcare delivery and limited coordination between primary and tertiary care (Gulliford *et al*., 2006). This study explores how structured CoC plans can enhance patient satisfaction in Chhattisgarh, addressing a critical need for integrated care systems.

Globally, CoC models have been successful in managing chronic conditions. For example, the United Kingdom's National Health Service (NHS) uses CoC frameworks to ensure seamless care transitions, improving outcomes for patients with long-term conditions (Freeman *et al*., 2007). In India, initiatives like the National Health Mission aim to strengthen CoC, but implementation challenges persist, particularly in rural areas like Chhattisgarh.

2.3 Patient Satisfaction

Patient satisfaction is a key indicator of healthcare quality, reflecting perceptions of service delivery, communication, and accessibility. Marshall and Hays (1994) developed the Patient Satisfaction Questionnaire (PSQ-18), which assesses dimensions such as general satisfaction, technical quality, interpersonal manner, communication, financial aspects, time spent with doctors, and accessibility. Donabedian (1988) positions patient satisfaction as a core component of healthcare quality, alongside structure and process.

Crow *et al*. (2002) identify key determinants of satisfaction, including provider communication, service accessibility, and care quality. In government hospitals, addressing these factors is challenging due to resource constraints and high patient volumes (Otani *et al*., 2012). In Chhattisgarh, patient satisfaction is often hampered by long wait times and inadequate infrastructure, making PRM and IT critical interventions.

Globally, patient satisfaction is a priority for healthcare systems. In the United States, the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey measures satisfaction, guiding quality improvement efforts (Otani *et al.*, 2012). In India, patient satisfaction studies are limited, particularly in public hospitals, highlighting the significance of this research.

2.4 Role of Information Technology

IT is a cornerstone of modern healthcare, enabling efficient data management, communication, and service delivery. Buntin *et al.* (2011) highlight IT's benefits, including improved quality, efficiency, and cost savings. Tools like EHRs, patient portals, and telemedicine enhance patient engagement and accessibility (Yen & Bakken, 2012). In Chhattisgarh, telemedicine initiatives have bridged rural-urban healthcare gaps, improving access for remote populations (Taqi *et al.*, 2017).

Globally, IT has revolutionized healthcare delivery. For example, Australia's My Health Record system provides patients with access to their health data, enhancing engagement and satisfaction (Buntin *et al.*, 2011). In India, the Ayushman Bharat Digital Mission aims to create a national health IT framework, but adoption in public hospitals is slow due to infrastructure and training challenges (Ludwick & Doucette, 2009).

In Chhattisgarh, IT adoption faces barriers such as low digital literacy and unreliable electricity, particularly in rural areas. However, successful telemedicine programs demonstrate IT's potential to enhance satisfaction (Taqi *et al.*, 2017). This study examines how IT can support PRM and CoC to improve patient outcomes.

2.5 Patient Retention and CoC

Patient retention involves maintaining ongoing relationships between patients and providers, closely linked to CoC. Reid *et al.* (2002) define continuity as a driver of retention, improving outcomes through consistent care. Saultz and Lochner (2005) emphasize that relational continuity enhances trust and satisfaction, critical for chronic disease management.

Gulliford *et al.* (2006) note that CoC improves health outcomes by reducing care gaps, particularly for long-term conditions. In Chhattisgarh, patient retention is challenging due to fragmented care and geographic barriers. Structured CoC plans can address these issues by ensuring coordinated care and regular follow-ups (Haggerty *et al.*, 2003).

Globally, patient retention is a priority for healthcare systems. In Canada, primary care networks use CoC to retain patients with chronic conditions, improving outcomes and satisfaction (Saultz & Lochner, 2005). In India, retention strategies are nascent, but PRM

and IT offer opportunities to strengthen patient-provider relationships.

3. RESEARCH METHODOLOGY

The methodology outlines the study's design, population, sample, data sources, variables, and analytical framework, ensuring a rigorous and reproducible approach.

3.1 Population and Sample

The study targeted patients visiting government healthcare facilities in Chhattisgarh, including district hospitals, community health centers, and medical colleges. A purposive sampling technique selected 440 respondents, ensuring representation across age, gender, income, and geographic location. Demographic analysis revealed:

- 59.3% were aged 25-34 years.
- 69.2% were female.
- 48.6% lived more than 20 km from healthcare facilities, highlighting rural access challenges.

The sample size was determined using Cochran's formula for finite populations, ensuring statistical power for inferential analyses.

3.2 Data and Sources of Data

Primary data were collected using a structured questionnaire adapted from validated scales: Patient Activation Measure (PAM), SERVQUAL, and PSQ-18. The questionnaire assessed:

- PRM factors (trust, loyalty, recommendation).
- IT usage (frequency and ease of use of EHRs, telemedicine, portals).
- CoC engagement (structured care plans).
- Patient satisfaction (PSQ-18 scores, 1-5 scale).
- All data were anonymized to protect respondent privacy, and ethical approval was obtained from Amity Business School's ethics committee.

3.3 Theoretical Framework

The study's theoretical framework includes:

- **Dependent Variable**: Patient satisfaction, measured using PSQ-18 scores.
- **Independent Variables**: PRM (trust, loyalty, recommendation), IT usage, and CoC engagement.
- **Moderating Variable**: Healthcare technology, assessed through usability and accessibility metrics.

Key assumptions, grounded in literature, include:

- PRM enhances patient engagement and satisfaction (Vardasca & Martins, 2011).
- IT improves communication and efficiency (Buntin *et al.*, 2011).
- CoC ensures long-term care coordination (Evashwick, 1989).

The framework posits that IT moderates the relationship between PRM, CoC, and satisfaction, amplifying their impact in resource-constrained settings.

3.4 Statistical Tools and Econometric Models
3.4.1 Descriptive Statistics
Descriptive statistics summarized demographic characteristics and variable distributions (mean, standard deviation, minimum, maximum). The Jarque-Bera test assessed data normality, with p-values >0.05 indicating normal distribution.

3.4.2 Inferential Analysis
- **Chi-Square Test**: Examined relationships between CoC and satisfaction (χ^2=18.92, p<0.01) and age and satisfaction (χ^2=15.45, p<0.05).
- **T-Test**: Assessed gender differences in satisfaction (p>0.05).
- **ANOVA**: Analyzed income and education impacts on satisfaction (F=4.62, p<0.01).

- **Pearson Correlation**: Evaluated relationships between PRM factors (loyalty: r=0.631; trust: r=0.598), IT usage (r=0.453), and satisfaction.
- **Regression Analysis**: Identified predictors of satisfaction (R^2=0.532, β for IT=0.312, p<0.01). Statistical analyses were conducted using SPSS 26.0, with a significance level of 0.05.

3.4.3 Hypothesis Testing
The study tested four hypotheses:
- **H1**: PRM significantly impacts patient satisfaction (Accepted, based on correlations and regression results).
- **H2**: IT significantly enhances patient satisfaction (Accepted, β=0.586, p<0.01).
- **H3**: CoC is related to patient satisfaction (Accepted, χ^2=18.92, p<0.01).
- **H4**: Healthcare technology impacts both satisfaction and CoC (Accepted, β=0.312, p<0.01).

4. RESULTS AND DISCUSSION
4.1 Descriptive Statistics

Table 4.1: Descriptive Statistics

Variable	Minimum	Maximum	Mean	Std. Deviation	Jarque-Bera	Sig
Patient Satisfaction	2.50	5.00	3.82	0.672	2.134	0.344
IT Usage	1.80	4.90	3.45	0.789	1.987	0.370
CoC Engagement	2.00	5.00	3.67	0.701	2.456	0.293
Trust	2.20	5.00	3.91	0.645	1.876	0.391
Loyalty	2.10	5.00	3.88	0.659	2.012	0.365

Table 4.1 presents descriptive statistics for key variables. Patient satisfaction had a mean of 3.82 (SD=0.672), indicating moderate to high satisfaction. IT usage (mean=3.45, SD=0.789) and CoC engagement (mean=3.67, SD=0.701) were significant contributors. Trust (mean=3.91, SD=0.645) and loyalty (mean=3.88, SD=0.659) showed high scores. The Jarque-Bera test confirmed normality (p>0.05), suggesting stable data distribution, consistent with predictable healthcare delivery patterns.

4.2 Key Findings
1. **PRM and Patient Satisfaction**: PRM factors, particularly loyalty (r=0.631) and trust (r=0.598), showed strong positive correlations with patient satisfaction, supporting H1. Regression analysis confirmed PRM's significant impact (p<0.01). These findings align with Vardasca and Martins (2011), who emphasize PRM's role in fostering engagement through personalized care and effective communication, critical in high-volume settings like Chhattisgarh's government hospitals.
2. **Role of Information Technology**: IT usage correlated positively with satisfaction (r=0.453), and regression analysis identified IT as a strong predictor (β=0.586, p<0.01), explaining 34.2% of the variance, supporting H2. This corroborates Buntin *et al*. (2011), who highlight IT's role in

enhancing service delivery. In Chhattisgarh, telemedicine and EHRs improved access for rural patients, reducing geographic barriers (Taqi *et al*., 2017).
3. **Continuum of Care**: A significant relationship was found between CoC and satisfaction (χ^2=18.92, p<0.01), supporting H3. Patients with structured care plans reported higher satisfaction, particularly those with chronic conditions. This aligns with Evashwick (1989), who emphasizes CoC's role in care coordination, reducing fragmentation and enhancing outcomes.
4. **Demographic Influences**: Age significantly influenced satisfaction (χ^2=15.45, p<0.05), with younger patients (25-34 years) reporting higher satisfaction, likely due to familiarity with IT tools. Income also impacted satisfaction (F=4.62, p<0.01), with higher-income patients reporting greater satisfaction, possibly due to access to supplementary services. Gender showed no significant effect (p>0.05), suggesting equitable care experiences.
5. **Healthcare Technology as a Moderator**: IT moderated the relationship between PRM, CoC, and satisfaction (β=0.312, p<0.01), supporting H4. Tools like patient portals and telemedicine enhanced communication and care continuity, particularly in rural areas, aligning with Yen and Bakken (2012).

4.3 Discussion

The findings highlight the transformative potential of PRM, IT, and CoC in Chhattisgarh's public healthcare system. PRM's focus on trust and loyalty aligns with global trends toward patient-centered care, as seen in developed systems like the NHS (Mohiuddin, 2019). The strong correlation between loyalty (r=0.631) and satisfaction underscores the importance of building long-term patient-provider relationships, particularly in resource-constrained settings where trust is often eroded by systemic inefficiencies.

IT's role as a predictor of satisfaction (β=0.586, p<0.01) reflects its capacity to bridge access gaps, a critical issue in Chhattisgarh, where 48.6% of respondents lived over 20 km from healthcare facilities. Telemedicine, in particular, has emerged as a game-changer, enabling remote consultations and reducing travel burdens (Taqi *et al.*, 2017). However, challenges such as low digital literacy and unreliable electricity hinder IT adoption, particularly among older patients, suggesting a need for targeted training and infrastructure improvements (Ludwick & Doucette, 2009).

The significant relationship between CoC and satisfaction (χ^2=18.92, p<0.01) highlights the value of structured care plans for chronic disease management, a pressing need given India's rising non-communicable disease burden. CoC's ability to reduce care fragmentation aligns with global best practices, such as Canada's primary care networks (Haggerty *et al.*, 2003). In Chhattisgarh, implementing CoC requires coordination between primary and tertiary care, supported by IT-enabled data sharing.

Demographic findings reveal nuanced patterns. The higher satisfaction among younger patients (25-34 years) may reflect their comfort with technology, while income disparities suggest that wealthier patients access supplementary services, highlighting equity challenges. The lack of gender differences (p>0.05) is encouraging, indicating that government hospitals deliver equitable care, a step toward universal healthcare goals.

Comparatively, global healthcare systems offer valuable lessons. The United States' HCAHPS survey emphasizes patient satisfaction as a performance metric, driving quality improvements (Otani *et al.*, 2012). Australia's My Health Record system demonstrates IT's potential to empower patients (Buntin *et al.*, 2011). In India, the Ayushman Bharat Digital Mission aims to replicate such models, but Chhattisgarh's public hospitals require tailored strategies to overcome local barriers.

Limitations include the study's focus on a single state, potentially limiting generalizability, and reliance on self-reported data, which may introduce bias. Future research should explore longitudinal designs and multi-state comparisons to validate findings.

5. CONCLUSION

This study confirms that PRM, IT, and CoC are pivotal in enhancing patient satisfaction in Chhattisgarh's government hospitals. PRM fosters trust and loyalty, IT improves communication and accessibility, and CoC ensures coordinated care for long-term health management. The findings highlight the need for public healthcare systems to prioritize IT investments, develop robust PRM strategies, and implement structured CoC plans to improve service quality and patient outcomes.

The acceptance of all four hypotheses underscores the synergistic potential of these interventions. IT's role as a strong predictor (β=0.586, p<0.01) and CoC's significant impact (χ^2=18.92, p<0.01) demonstrate their transformative capacity, particularly for rural and younger populations. By addressing barriers like geographic distance, low digital literacy, and resource constraints, Chhattisgarh can advance toward universal healthcare coverage, delivering equitable, patient-centered care.

6. RECOMMENDATIONS

Based on the findings, the following recommendations are proposed:

1. **Strengthen PRM Systems**: Implement regular patient feedback mechanisms and personalized communication strategies to build trust and loyalty. Training healthcare staff in PRM principles can enhance patient-provider interactions, fostering long-term relationships.
2. **Invest in IT Infrastructure**: Expand access to EHRs, patient portals, and telemedicine, particularly in rural areas. User-friendly interfaces and training programs can improve adoption among diverse populations, addressing digital literacy barriers.
3. **Implement Structured CoC Plans**: Develop standardized care protocols for chronic disease management, ensuring informational, relational, and management continuity. Collaboration between primary and tertiary care facilities can reduce care gaps and enhance outcomes.
4. **Address Socioeconomic Disparities**: Introduce subsidies, mobile health units, or community health worker programs to improve access for low-income and remote patients, ensuring equitable satisfaction levels.
5. **Policy Support**: Advocate for state-level policies to fund IT infrastructure and CoC frameworks, aligning with national initiatives like the Ayushman Bharat Digital Mission. Public-private partnerships can accelerate implementation.
6. **Future Research**: Conduct longitudinal studies to assess the long-term impact of PRM, IT, and CoC on patient outcomes. Multi-state comparisons can identify best practices for scaling interventions across India.

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