Original Article

Enhancing Hospital Operations through the Annual Operational Plan: A 2-year Comparative Analysis in a Charitable Multispecialty Hospital in India

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Abstract

Background: In the evolving healthcare landscape, hospitals face multifaceted challenges, including rising patient demands, limited resources, and the need for sustained quality improvements. Traditional accreditation systems, such as those from the National Accreditation Board for Hospitals and the National Accreditation Board for Testing and Calibration Laboratories, primarily focus on clinical quality and patient safety but often overlook broader operational aspects such as billing accuracy, insurance processing, and interdepartmental coordination. The objective of this study was to address these gaps, the Annual Operational Plan (AOP) framework, adapted from corporate strategic planning models, that was introduced in a charitable multispecialty hospital to promote compliance, accountability, and efficiency across departments. **Materials and Methods:** This study employed a comparative analysis of AOP compliance over 2 years in 39 departments. Compliance was categorized as completed, partial, or noncompliant for AOP items. The Plan-Do-Check-Act (PDCA) cycle was utilized for iterative monitoring, involving quarterly audits, feedback sessions, and targeted interventions. Statistical evaluations, including Chi-square tests, assessed changes in compliance rates and operational performance. **Results:** Total AOP items decreased from 334 in 2023–2024 to 279 in 2024–2025 due to refinements, but completed items rose from 119 (35.6%) to 160 (57.3%), while noncompliance fell from 43 (12.9%) to 5 (1.8%) ($\chi^2 = 52.34$, $P < 0.00001$). Departments such as blood bank, biomedical, and accident and emergency showed marked improvements, with blood bank achieving 100% completion. These gains were linked to enhanced departmental engagement and structured oversight. **Conclusion:** The AOP, integrated with PDCA, significantly boosted operational efficiency and accountability, filling voids in accreditation standards. While promising for resource-constrained settings, future research should explore patient outcomes, financial impacts, and long-term viability to validate its broader applicability.

Keywords: Annual operational plan, hospital management, operational efficiency, quality improvement

Résumé

Contexte: Dans un paysage des soins de santé en constante évolution, les hôpitaux sont confrontés à des défis multiples, notamment l'augmentation des demandes des patients, des ressources limitées et la nécessité d'améliorations durables de la qualité. Les systèmes d'accréditation traditionnels, tels que ceux du National Accreditation Board for Hospitals et du National Accreditation Board for Testing and Calibration Laboratories, se concentrent principalement sur la qualité clinique et la sécurité des patients, mais négligent souvent des aspects opérationnels plus larges tels que l'exactitude de la facturation, le traitement des assurances et la coordination interdépartementale. L'objectif de cette étude était de combler ces lacunes; le cadre du Plan Opérationnel Annuel (AOP), adapté des modèles de planification stratégique des entreprises, a été introduit dans un hôpital caritatif multispecialité afin de promouvoir la conformité, la responsabilité et l'efficacité au sein des

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départements. **Matériels et méthodes:** Cette étude a utilisé une analyse comparative de la conformité à l'AOP sur 2 ans dans 39 départements. La conformité a été classée comme complète, partielle ou non conforme pour les éléments de l'AOP. Le cycle Planifier-Faire-Vérifier-Agir (PDCA) a été utilisé pour un suivi itératif, impliquant des audits trimestriels, des sessions de rétroaction et des interventions ciblées. Des évaluations statistiques, y compris des tests du chi carré, ont permis d'analyser les variations des taux de conformité et de la performance opérationnelle. **Résultats:** Le nombre total d'éléments de l'AOP est passé de 334 en 2023–2024 à 279 en 2024–2025 en raison de raffinements, mais le nombre d'éléments complétés a augmenté de 119 (35,6 %) à 160 (57,3 %), tandis que la non-conformité a diminué de 43 (12,9 %) à 5 (1,8 %) (χ^2 = 52,34; P < 0,00001). Des départements tels que la banque de sang, le biomédical et les urgences ont montré des améliorations marquées, la banque de sang atteignant un taux d'achèvement de 100 %. Ces progrès ont été associés à un engagement accru des départements et à une supervision structurée. **Conclusion:** L'AOP, intégré au PDCA, a considérablement amélioré l'efficacité opérationnelle et la responsabilisation, comblant ainsi les lacunes des normes d'accréditation. Bien que prometteur pour les contextes à ressources limitées, des recherches futures devraient explorer les résultats pour les patients, les impacts financiers et la viabilité à long terme afin de valider son applicabilité à plus grande échelle.

Mots-clés: Plan opérationnel annuel, gestion hospitalière, efficacité opérationnelle, amélioration de la qualité

Introduction

Hospitals globally are grappling with unprecedented pressures in the postpandemic era, marked by surging patient volumes, constrained resources, escalating operational costs, and an unyielding demand for quality enhancements.[1] In India, where healthcare delivery is often fragmented and resource-limited, these challenges are amplified, particularly in charitable hospitals that serve underserved populations while balancing financial sustainability.[2] Accreditation frameworks, such as the National Accreditation Board for Hospitals (NABH) and the National Accreditation Board for Testing and Calibration Laboratories, have undeniably advanced clinical standards and patient safety by enforcing protocols for care delivery and laboratory practices.[3] However, these systems predominantly emphasize clinical metrics, leaving critical operational domains – such as supply chain management, administrative workflows, and interdepartmental synergies – underaddressed, which can lead to inefficiencies and suboptimal institutional performance.[4] To mitigate these shortcomings, healthcare institutions are increasingly adopting the Annual Operational Plan (AOP), a strategic tool borrowed from industrial and corporate sectors, to streamline management and foster holistic improvements.[4] The AOP serves as a dynamic blueprint that aligns departmental objectives with institutional goals, promoting proactive planning and measurable outcomes. Its mechanisms include fostering cross-departmental alignment to break down silos, thereby enhancing patient throughput and reducing length of stay (LOS); integrating predictive analytics for resource optimization, such as bed allocation and surgical scheduling; and embedding financial controls to ensure prudent budgeting for staffing, technology, and infrastructure.[5] Additionally, AOPs incorporate key performance indicators into dashboards for real-time tracking of metrics such as wait times and error rates, enabling agile responses to operational bottlenecks.[6] Empirical evidence underscores the AOP's efficacy. For instance, machine learning applications within operational planning have predicted patient discharges with high accuracy (area under the curve: 75.7%–92.5%), yielding 10%–28.7% increases in discharge rates, reduced readmissions (P < 0.001), LOS reductions of 0.67 days, and cost savings of US$55–72 million annually.[7] Lean methodologies, often integrated into AOPs, have similarly demonstrated inpatient care improvements through waste reduction and process streamlining.[8] In charitable hospitals, where margins are thin and reliance on donations is high, AOPs can enhance financial stewardship without compromising mission-driven care.[3] Despite these benefits, the literature reveals gaps in AOP application, especially in nonprofit settings in developing countries like India.[9] Studies have focused on isolated interventions, such as discharge prediction or insurance processes,[10] but overlook comprehensive, cross-departmental implementations in areas beyond accreditation, including billing accuracy and coordination.[11] This study addresses this void by evaluating AOP deployment in a charitable multispecialty hospital in Pune, India, emphasizing its impact on operational performance. Furthermore, the integration of the Plan-Do-Check-Act (PDCA) cycle within AOPs provides a structured approach for continuous improvement. Originating from quality management pioneers like W. Edwards Deming, PDCA has been widely applied in healthcare to standardize processes and reduce errors.[12]

Objective

This study leverages PDCA for iterative AOP refinements, offering novel insights into its synergy with operational planning in resource-constrained environments. Charitable hospitals in India, play a pivotal role in universal health coverage but often struggle with operational inefficiencies due to limited funding and high patient loads.[3]

Materials and Methods

This prospective, comparative study was conducted at a charitable multispecialty hospital in Pune, India, renowned for its commitment to affordable care for low-income communities. The hospital features over 350 beds, serving diverse specialties

including cardiology, oncology, and emergency services. Selected for its operational diversity and emphasis on underserved populations, the setting provided an ideal context to test AOP implementation amid resource constraints typical of Indian charitable institutions. The study spanned 2 years (April 2023 to March 2025), allowing for longitudinal assessment of AOP rollout and refinements. A pre–postcomparative design evaluated compliance across 39 departments, categorized into clinical (e.g., intensive care unit and operation theater), nonclinical (e.g., housekeeping and maintenance), and administrative (e.g., billing and human resources). The AOP was crafted through a collaborative, dual-tier approach. Institutional benchmarks were standardized based on hospital policies, NABH guidelines, and operational best practices.[3] Department-specific objectives were co-developed by heads and the quality team, ensuring alignment with unique needs – e.g., reducing wait times in accident and emergency (A and E) or optimizing inventory in Pharmacy. Items targeted

Table 1: Details of year 1 compliance

Departments	Total AOP	Completed	Partial	Noncompliance
A and E	4	3	1	0
Billing	4	0	4	0
Biomedical	6	2	4	0
Blood bank	5	0	4	1
Cath lab	6	0	6	0
Clinical nutrition	12	3	9	0
Clinical pharmacology	6	4	2	0
Contact center	17	10	6	1
CSSD	5	1	4	0
Endoscopy	6	0	5	1
F and B	13	5	7	1
Finance	7	3	4	0
Fire and safety	6	0	4	2
GRO	6	4	2	0
HK	21	8	9	4
HR	12	0	10	2
ICN	4	1	3	0
ICU	6	2	4	0
IPD	7	1	6	0
IT	24	14	4	6
Lab	5	4	1	0
Maintenance	18	5	10	3
Medical admin	5	2	3	0
Microbiology	3	2	1	0
MRD	4	2	2	0
Nursing	7	0	7	0
OPD	15	3	9	3
OT	6	2	3	1
Pharmacy	19	16	2	1
Physiotherapy	5	1	3	1
Projects	6	3	2	1
Purchase	3	2	1	0
Quality	10	0	4	6
Radiology	7	2	4	1
Revenue	6	6	0	0
Security	4	1	3	0
Stores	11	1	10	0
Ward	5	3	2	0
Wellness	18	3	7	8
Total	334	119	172	43

AOP=Annual operational plan, A and E=Accident and emergency, HR=Human resources, HK=Housekeeping, OT=Operation theater, ICU=Intensive care unit, OPD=Outpatient department, IPD=Inpatient department, IT=Information technology, MRD=Medical record department, GRO=Guest relation office, CSSD=Central sterile supply department

Table 2: Compliance in year 2

Departments	Total AOP	Completed	Partial	Noncompliance
A and E	4	4	0	0
Billing	7	0	7	0
Biomedical	6	5	1	0
Blood bank	6	6	0	0
Cath lab	5	4	1	0
Clinical nutrition	14	14	0	0
Clinical pharmacology	5	4	1	0
Contact center	8	7	0	1
CSSD	4	3	1	0
Endoscopy	7	2	5	0
F and B	17	11	6	0
Finance	6	4	2	0
Fire and safety	7	5	2	0
GRO	9	1	8	0
HK	11	3	8	0
HR	8	1	7	0
ICN	2	2	0	0
ICU	6	4	2	0
IPD	9	0	9	0
IT	7	3	4	0
Lab	4	4	0	0
Maintenance	13	10	1	2
Medical admin	8	7	1	0
Microbiology	4	4	0	0
MRD	5	1	3	1
Nursing	7	4	3	0
OPD	13	0	13	0
OT	6	2	3	1
Pharmacy	5	4	1	0
Physiotherapy	5	1	4	0
Projects	6	6	0	0
Purchase	4	4	0	0
Quality	5	4	1	0
Radiology	7	1	6	0
Revenue	5	4	1	0
Security	5	0	5	0
Stores	7	7	0	0
Ward	6	2	4	0
Wellness	16	12	4	0
Total	279	160	114	5

AOP=Annual operational plan, A and E=Accident and emergency, HR=Human resources, HK=Housekeeping, OT=Operation theater, ICU=Intensive care unit, OPD=Outpatient department, IPD=Inpatient department, IT=Information technology, MRD=Medical record department, GRO=Guest relation office, CSSD=Central sterile supply department

nonaccredited areas such as insurance processing, billing accuracy, and coordination, with a total of 334 in year 1 and 279 in year 2 after refinements. Compliance was scored on a 5-point scale adapted from quality frameworks: 5 (fully achieved), 1 (partially achieved), and 0 (not achieved). Metrics encompassed efficiency (e.g., throughput and wait times), finance (e.g., billing errors), and coordination (e.g., referral delays). Quarterly audits involved document reviews and site visits, followed by individualized feedback sessions with department leads to validate data and devise solutions. This iterative process, applied hospital-wide, fostered accountability. Statistical analysis used Chi-square tests for compliance changes ($P < 0.05$ significance) via Python's SciPy library. As a management intervention without patient data, ethics approval was not required per institutional guidelines. Data were aggregated and anonymized for privacy.

Results

AOP implementation yielded significant improvements. In 2023–2024, 334 items across 39 departments resulted in 119 completions (35.6%), 172 partials (51.5%), and 43 noncompliances (12.9%) [Table 1]. By 2024–2025, items were refined to 279, with 160 completions (57.3%), 114 partials (40.9%), and 5 noncompliances (1.8%). Chi-square analysis confirmed statistical significance ($\chi^2 = 52.34$, $P < 0.00001$), indicating enhanced outcomes from monitoring [Table 2]. High-impact departments excelled. Blood bank advanced from 0/5 completions to 6/6, eliminating noncompliance through PDCA-driven inventory protocols. Biomedical improved from 2/6 to 5/6, reducing equipment downtime. A and E achieved full completion (4/4 from 3/4), enhancing emergency response. Clinical nutrition surged from 3/12 to 14/14, optimizing patient diets. Conversely, billing and outpatient department showed persistent partials, indicating areas for further intervention. These trends reflect proactive gap identification, with AOP expansions in 20 departments addressing emerging needs like digital integration.

Discussion

The AOP framework's success in this charitable hospital underscores its value in extending governance to nonaccredited domains, yielding efficiency gains akin to lean implementations.[8] Unlike targeted studies on discharge analytics or billing reengineering,[11] this holistic approach integrated PDCA for iterative enhancements, mirroring the Surgical Care and Outcomes Assessment Program's quality improvements.[13-15] In India, where charitable hospitals face funding challenges, AOPs are essential for building up sustainable healthcare services.[3] Efficiency analyses in public systems show similar score uplifts, but this study's cross-departmental focus adds novelty. Staff engagement, bolstered by reviews, echoes findings on empowerment's role in performance.[16-18] PDCA's application enhanced nursing and administrative processes, consistent with reviews showing quality uplifts.[12,13] Strengths include scalability for resource-limited settings, but limitations persist: quantitative focus overlooks qualitative metrics like patient satisfaction. Lack of controls and variability limit generalizability, though trends suggest robustness. Reporting burdens from expanded AOPs could be alleviated via automation.[15] This research advances evidence on AOPs in charitable contexts, promoting feedback loops for resilience and offering a model for Indian hospitals under schemes like Pradhan Mantri Jan Arogya Yojana (PM-JAY). Traditionally, accreditation processes have been confined to formalized, resource-rich institutions, often leaving charitable hospitals – which operate on shoestring budgets and volunteer-driven models – in a governance vacuum. While studies on discharge analytics focus narrowly on patient throughput and readmission rates, and billing reengineering targets financial bottlenecks, the AOP framework encompasses the entire operational ecosystem. By embedding PDCA, the framework facilitates iterative enhancements, allowing for real-time adjustments based on performance data. This mirrors the collaborative ethos of programs like the Surgical Care and Outcomes Assessment Program (SCOAP), where multidisciplinary teams drive quality improvements through shared metrics and feedback. In the Indian healthcare landscape, charitable hospitals grapple with chronic funding shortages, exacerbated by reliance on donations, government subsidies, and out-of-pocket payments from low-income patients. This study's novelty lies in its cross-departmental lens, which reveals how interconnected inefficiencies – such as miscommunication between nursing and pharmacy teams – can compound into larger issues such as medication errors or prolonged hospital stays. Addressing these holistically not only boosts overall efficiency but also enhances patient safety, a critical concern in under-resourced settings. Empowerment, as echoed in the literature, plays a pivotal role in elevating performance. In this hospital, frontline staff – nurses, administrators, and support personnel – were actively involved in identifying bottlenecks and proposing solutions, fostering a sense of ownership. This approach contrasts with top-down mandates that often lead to resistance and suboptimal implementation. By empowering staff, the framework taps into their tacit knowledge, leading to more contextually relevant improvements. The application of PDCA specifically to nursing and administrative processes yielded tangible enhancements, aligning with broader reviews on quality uplifts. In nursing, PDCA cycles streamlined patient assessment protocols, minimizing documentation errors and freeing up time for direct care. Administratively, it optimized inventory management, ensuring that essential supplies were available without overstocking, thus controlling costs. These improvements are consistent with global evidence showing how structured quality cycles can elevate service delivery. One of the framework's key strengths is its scalability, making it particularly suited for resource-limited settings. AOPs can be easily rolled out incrementally with minimal upfront investment. This scalability allows small charitable hospitals to start with pilot departments, such as outpatient services, before expanding hospital wide. The potential for replication across India's vast network of charitable facilities is immense, offering

a blueprint for enhancing efficiency without compromising on compassionate care. In an era of unpredictable funding and health crises, such as pandemics, resilient systems are paramount. By demonstrating how charitable hospitals can achieve governance parity with accredited peers, this study advocates for policy shifts that recognize and incentivize such internal frameworks. In India, where the healthcare sector is a mosaic of public, private, and charitable entities, inefficiencies often stem from fragmented governance rather than resource scarcity alone. AOPs address this by instilling a governance mindset at the grassroots level, empowering institutions to self-regulate and innovate. This bottom-up approach complements top-down policies, creating a synergistic ecosystem. In traditional silos, administrative delays might hinder clinical decisions, but AOPs break these barriers through shared PDCA cycles. This not only accelerates processes but also enhances knowledge sharing, where administrative staff gain insights into clinical needs, and vice versa. Considering staff empowerment in greater detail, it is worth noting how AOPs transform passive roles into active contributors. Through regular review meetings, staff voices are amplified, leading to innovative solutions tailored to local challenges. Addressing limitations more comprehensively, the quantitative bias could be balanced by incorporating mixed methods in future studies. While efficiency scores provide objective data, narratives from patients and staff add depth, revealing nuances like cultural barriers to process adoption. The lack of controls, while pragmatic, suggests quasi-experimental designs for subsequent research, perhaps comparing AOP-adopting hospitals with nonadopters.

Conclusion

AOP implementation markedly elevated compliance, accountability, and efficiency, with PDCA enabling targeted gains in key departments such as blood bank and A and E. This framework cultivates a proactive culture, addressing accreditation gaps in charitable hospitals. While patient and long-term assessments are needed, AOPs emerge as vital for quality enhancement in constrained environments, informing policy for sustainable healthcare in India.

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Conflicts of interest

There are no conflicts of interest.

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