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Omni-Channel Approach For Mentoring Community Health Officers To Improve Quality Of Health Services In Ayushman Arogya Mandirs Of Bihar

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Abstract

The Ayushman Bharat initiative in India, which envisions the transformation of sub-health centres into Ayushman Arogya Mandirs (AAMs), represents a milestone in India's journey towards Universal Health Coverage (UHC). AAMs are mandated to deliver comprehensive primary healthcare through the deployment of Community Health Officers (CHOs) as mid-level service providers. Despite their crucial role, CHOs face challenges including clinical uncertainty, administrative bottlenecks, and suboptimal community engagement. This study evaluates the effectiveness of an Omni-Channel Mentorship Approach (OCA) in enhancing the performance of CHOs in Madhubani district, Bihar. The mentorship combined virtual and onsite engagements, targeting clinical capacity, administrative efficiency, and community participation. Using a mixed-method design, data from 30 AAMs were analysed before and after the intervention. Findings revealed statistically significant improvements in outpatient attendance ($P<0.01$), non-communicable disease screening ($P<0.01$), antenatal care check-ups ($P<0.05$), VHSND conducted ($P<0.05$); health education sessions ($P<0.01$) and essential drug availability ($P<0.01$). Qualitative findings highlighted increased CHO confidence, operational efficiency, team coordination and stronger community interface. Authors argue that structured and context-specific mentoring mechanisms are critical for optimizing the AAM model, especially in underserved regions. Institutionalizing mentorship protocols, developing standardized monitoring tools, and policy-level integration are essential for sustainable CHO capacity building for optimizing primary healthcare delivery in resource-constrained settings.

Keywords: Ayushman Bharat, Community Health Officers, primary healthcare, Omni-Channel Approach, mentoring, supportive supervision, health systems strengthening

Introduction

In recent years, the Government of India has made significant strides towards achieving Universal Health Coverage (UHC), primarily through the launch of the Ayushman Bharat programme in 2018. One of the programme's core components is the establishment of Health and Wellness Centres (HWCs), which were rebranded as Ayushman Arogya Mandirs (AAMs). These centres aim to provide comprehensive primary healthcare (CPHC), covering promotive, preventive, curative, rehabilitative, and palliative services.[1] As part of this ambitious reform, Community Health Officers (CHOs) have been deployed as mid-level health providers to manage these centres. Typically trained as nurses or AYUSH practitioners, CHOs serve as critical connectors between the formal health system and underserved rural populations.[2,3]

Despite structured training modules, CHOs face substantial challenges on the ground—including administrative burden, stock management, and coordination with front-line workers such as ASHAs and ANMs. Numerous studies have underscored that while classroom-based training improves knowledge, real-time mentoring and supportive supervision are critical for practical skill enhancement and service delivery optimization.[4-6] In resource-constrained settings like Bihar, where systemic gaps in rural healthcare delivery persist, a structured mentoring framework can play a pivotal role in bridging the know-do gap.

The concept of mentorship in healthcare is rooted in adult learning theories, emphasizing experiential learning, problem-solving, and ongoing feedback.[7] (Hewitt et al., 2019). Mentorship serves not only as a clinical capacity-building tool but also enhances leadership, problem-solving, and motivation among CHOs. The National Health Systems Resource Centre (NHSRC) also advocates mentorship-based supportive supervision to ensure adherence to quality standards under National Quality Assurance Standards (NQAS). Mentorship and supportive supervision have long been identified as vital elements in building frontline health worker capacity. Recent evidence from sub-Saharan Africa and South Asia suggests that structured mentorship significantly diagnostic acumen, improves adherence to treatment protocols, record-keeping practices, motivation among health workers and health outcomes. [8-11]In India, similar mentoring frameworks have been utilized effectively in maternal and child health, tuberculosis management,

and quality assurance.[12,13] However, logistical and human resource limitations often constrain traditional face-to-face mentoring models. Moreover, the application of a digitally enabled, omni-channel mentorship—combining virtual and onsite engagements for CHOs in AAMs—remains underexplored. Hence, an Omni-Channel Approach (OCA), combining virtual and in-person mentoring modalities, is proposed as a more scalable and sustainable model. This mentorship model sought to integrate regular virtual learning, real-time case discussions, administrative guidance, and structured physical visits by trained quality assurance professionals.

The main aim of the study was to contribute evidence toward strengthening the AAM delivery framework and to inform scalable mentoring strategies across similar low-resource settings in India and other low- and middle-income countries (LMICs). Specific objectives of the study were to assess the role of Omni-Channel Mentorship Approach (OCA) of mentorship and hand-holding support to CHOs at AAMs; to evaluate improvements in healthcare service delivery and to identify gaps and challenges in current supportive supervision mechanisms in AAMs.

Materials and Methods

Study Design and Setting: A mixed-method observational study was conducted in Madhubani district, Bihar—a socioeconomically backward district characterized by low health indicators and high burden of non-communicable and maternal health issues.

Study Area and period: Total 10 blocks of Madhubani district of Bihar were selected for this study for six months, from October 2024 to March 2025.

Sampling Technique: A purposive sampling strategy was employed. Out of the district's 21 blocks, 10 blocks were selected based on geographic representation, CHO availability, and functional AAM status. Within each block, 3 AAMs were included, resulting in a total of 30 CHOs who met the inclusion criteria:

- At least 6 months of continuous posting,
- Willingness to participate,
- Minimum engagement with community outreach activities.

Mentorship Intervention: The Omni-Channel Approach: The intervention involved a combination of:

- Eight virtual capacity-building sessions (1 per week), conducted using tele-platforms,
- Ten onsite mentorship visits (1 per block), focusing on live observation, audit feedback, and clinical coaching,
- Telephonic follow-ups to address emerging issues.

Two experienced mentors, certified as National Quality Assurance Standards (NQAS) assessors, led the initiative. Mentorship content covered (1) Clinical management (NCD, RMNCH+A); (2) Inventory and stock management; (3) Health promotion and intersectoral coordination; (4) Community participation strategies; and (5) Data quality and HMIS compliance.

Data Collection: To assess the impact of the Omni-Channel Mentorship Approach (OCA), both quantitative and qualitative data were systematically collected and analysed. Quantitative data were sourced from routine health system registers maintained at each Ayushman Arogya Mandir (AAM). These included the Outpatient Department (OPD) registers, Non-Communicable Disease (NCD) screening registers, Antenatal Care (ANC) check-up records, Village Health, Sanitation and Nutrition Day (VHSND) micro plans, and drug stock inventory. Baseline data were collected during October 2024, prior to the initiation of the mentorship intervention, while follow-up data were gathered from January to March 2025 following the completion of all mentorship activities.

The key performance indicators assessed included: average monthly outpatient attendance, number of individuals screened for NCDs per month, average monthly antenatal care check-ups conducted, frequency of VHSNDs held per month, number of health education sessions delivered, and the average number of days per month when essential drugs were reported to be out of stock. These indicators were selected for their relevance in capturing both the clinical and outreach functions of CHOs within the primary healthcare setting.

Plan of data analysis: Statistical analysis of the quantitative data was conducted using paired sample t-tests to compare mean differences in key indicators before and after the intervention. A p-value of less than 0.05 was considered statistically significant, indicating a meaningful change in service delivery attributable to the mentorship intervention. To complement the quantitative findings, qualitative insights were obtained through semi-structured interviews conducted with a purposively selected

sample of 15 Community Health Officers and 5 mentors who had participated in the mentorship intervention. These interviews explored perceptions of mentorship quality, barriers to implementation, and perceived improvements in service delivery and professional confidence. Interviews were transcribed, anonymized, and analysed using a framework analysis approach. NVivo qualitative data analysis software was employed to code responses and organize themes. To ensure the robustness of qualitative analysis, inter-rater reliability was assessed, yielding a strong agreement coefficient ($\kappa = 0.81$).

Results

The study included 30 Community Health Officers (CHOs) deployed at Ayushman Arogya Mandirs (AAMs) across 10 blocks in Madhubani district, Bihar. The socio-demographic characteristics of the participants were collected using a structured format to provide contextual understanding of the CHOs' professional backgrounds and personal attributes, which may influence their performance and responsiveness to mentoring interventions. Table 1 presents socio-demographic data of study participants.

Table 1. Socio-demographic profile of study participants

Variables	Frequency (%)
Gender	
Female	20 (66.7%)
Male	10 (33.3%)
Age Group	
25–29 years	12 (40.0%)
30–34 years	14 (46.7%)
35–39 years	04 (13.3%)
Educational Qualification	
B.Sc. Nursing	18/30 (60.0%)
AYUSH (BAMS/BHMS)	12/0) (40.0%)
Years of Experience as CHO	
Less than 1 year	02 (6.7%)
1–3 years	24 (80.0%)
More than 3 years	04 (13.3%)
Native to District or Nearby	
Yes	22 (73.3%)
No	8 (26.7%)
Received Formal CPHC Training	
Yes	25/30 (83.3%)
No	5 (16.7%)
Undergone In-Service Training	
Yes	12 (40.0%)
No	18 (60.0%)
Additional Admin Responsibilities	
Yes	10 (33.3%)
No	20 (66.7%)

The majority of the CHOs were female (66.7%), reflecting the national recruitment trend that prioritizes nursing graduates and female healthcare providers for mid-level service delivery roles. The average age of participants was 30.6 years (SD ± 4.2), with ages ranging from 25 to 38 years. In terms of educational qualifications, 60% of CHOs held a Bachelor of Science in Nursing (B.Sc. Nursing), while the remaining 40% were graduates in AYUSH disciplines (Bachelor of Ayurvedic Medicine and Surgery or Bachelor of Homeopathic Medicine and Surgery). Most participants (80%) had between 1 and 3 years of field experience at AAMs. The majority of CHOs (73.3%) were native to the same or adjacent districts, indicating a high degree of local familiarity, which has been associated with stronger community rapport and better service utilization. Nearly 83% of participants reported having received formal induction training under the Comprehensive Primary Healthcare (CPHC) module, though only 40% had participated in any form of in-service training or refresher courses post-deployment. About one-third of CHOs reported additional administrative responsibilities, such as supply chain management or data reporting, beyond their clinical duties.

Table 2 summarizes the change in service delivery indicators across the 30 AAMs. The analysis of key service delivery indicators across the 30 Ayushman Arogya Mandirs (AAMs) revealed statistically significant improvements following the implementation of the Omni-Channel Mentorship Approach. Average monthly outpatient attendance increased markedly by 36.9%, while NCD screenings rose by 57.8%, and antenatal care (ANC) check-ups improved by 42.8%. Community outreach efforts also showed considerable gains, with the number of VHSNDs conducted increasing by 61.9%, and health education sessions nearly doubling with a 74.4% rise. Notably, the number of days with essential drug stock-outs decreased significantly by 63.8%, indicating enhanced administrative and inventory management. All observed changes, except ANC and VHSNDs, were highly significant at $p<0.01$, underscoring the effectiveness of structured mentorship in improving both clinical service delivery and operational efficiency.

Table 2. change in service delivery indicators across the 30 AAMs.

Indicator	Pre-Mentoring Mean (±SD)	Post-Mentoring Mean (±SD)	% Change	p-value
OPD Attendance/month	312 ± 78	427 ± 85	+36.9%	<0.01
NCD Screenings/month	102 ± 35	161 ± 41	+57.8%	<0.01
ANC Check-ups/month	28 ± 10	40 ± 11	+42.8%	<0.05
VHSNDs Conducted/month	2.1 ± 0.7	3.4 ± 0.8	+61.9%	<0.05
Health Education Sessions/month	4.3 ± 1.2	7.5 ± 1.3	+74.4%	<0.01
Drug Stock-out Days/month	5.8 ± 2.1	2.1 ± 1.0	–63.8%	<0.01

When compared service delivery performance with sociodemographic variables, the analysis revealed that In-Service Training had a statistically significant impact on OPD attendance ($p = 0.0133$), indicating that CHOs who had received in-service training were likely to achieve better outpatient service performance. This suggests that periodic capacity building and continuous learning opportunities can directly influence service delivery outcomes at Ayushman Arogya Mandirs (AAMs). Other sociodemographic variables such as gender, education, and years of experience did not show statistically significant associations with OPD attendance, suggesting that training and professional development may be more critical drivers of performance than static demographic characteristics.

The qualitative component of the study offered rich insights into the lived experiences of CHOs who received mentorship under the Omni-Channel Mentorship Approach (OCA). Five key themes emerged from the analysis, namely, (1) Clinical Confidence; (2) Operational Support and Administrative Efficiency; (3) Community Engagement; (4) Mentorship Gaps and Structural Constraints; and (5) Standardization of Mentoring Approaches. This highlight both the benefits and challenges of the mentoring process. Figure 1 presents experiences of CHOs receiving Mentorship.

Clinical Confidence: A recurring theme among CHOs was the enhancement of clinical self-confidence following mentorship sessions. Many participants shared that regular interaction with mentors helped them clarify clinical doubts, reinforce decision-making skills, and independently manage common conditions such as hypertension, diabetes, and antenatal complications. One CHO reflected,

"After each mentorship visit, I felt more confident handling cases independently."

This suggests that structured guidance served as a bridge between theoretical training and real-world clinical application. The improvement in clinical competence was particularly evident among newly deployed CHOs, who often faced challenges in making autonomous decisions. Mentorship thus played a pivotal role in strengthening clinical acumen and self-efficacy.

Figure 1. Experiences of CHOs receiving Mentorship

Operational Support and Administrative Efficiency: Mentors also provided tangible support in streamlining routine operational tasks such as inventory management, reporting, and documentation. CHOs reported that prior to mentorship, they often struggled with delays in data submission and inadequate stock organization. As one participant shared,

"My mentor helped me reorganize drug inventory and fix reporting delays."

This hands-on guidance helped CHOs adopt better practices in maintaining records, aligning stock with monthly consumption, and ensuring timely reporting through the Health Management Information System (HMIS). The mentoring sessions also covered digital reporting formats and indicators, thereby enhancing administrative efficiency and reducing the burden of non-clinical work. Community Engagement: Mentorship also contributed to improved planning and execution of community-level health activities. CHOs were encouraged to collaborate more proactively with Accredited Social Health Activists (ASHAs) and Auxiliary Nurse Midwives (ANMs), leading to increased participation in health promotion events. One CHO noted that their approach changed after mentorship, which is echoed in following verbatim,
"We started more group sessions with ASHAs after mentor feedback."

This change fostered a team-based approach to health education, screening, and follow-up care. By strengthening the interface between the AAM and the community, mentorship enhanced the reach and effectiveness of health promotion interventions, especially during Village Health, Sanitation and Nutrition Days (VHSNDs).

Mentorship Gaps and Structural Constraints: Despite the positive impact, several CHOs expressed concerns about the inconsistency and unpredictability of mentorship visits. Many mentors, who were often senior health officials or external assessors, faced conflicting responsibilities that limited their availability. As one CHO expressed frustration.

"Mentors often come late or skip visits because they have too many responsibilities."

Such disruptions in mentorship scheduling diluted the continuity and effectiveness of the intervention. These gaps were attributed to structural constraints such as limited human resources, lack of dedicated mentoring staff, and inadequate logistical support. This theme underscores the need for institutionalizing mentorship as a formal, protected responsibility within the health system.

Standardization of Mentoring Approaches: The final theme that emerged from the interviews was the variability in mentoring styles and content. CHOs pointed out that the absence of a uniform mentoring framework resulted in inconsistent guidance. One participant said,

"Every mentor has a different style of mentoring. It would make mentoring more effective if they use standard content and a common protocol."

This observation suggests the need for developing a standardized mentorship toolkit with structured session plans, checklists, and quality assurance

metrics. Standardization would ensure that all CHOs, regardless of location or mentor, receive consistent and comprehensive capacity-building support aligned with national service delivery protocols.

Implementation challenges

Challenges encountered during the implementation of the mentorship intervention included irregular supervisory visits, largely attributed to staffing shortages, transportation constraints, and the absence of standardized mentorship tools and protocols. Qualitative findings clearly indicated that structured mentorship significantly enhanced the confidence and clinical decision-making abilities of newly appointed Community Health Officers (CHOs). Additionally, it fostered improved coordination with other frontline workers, particularly Auxiliary Nurse Midwives (ANMs) and Accredited Social Health Activists (ASHAs), thereby strengthening the overall functionality of the Ayushman Arogya Mandirs. Feedback and encouragement provided by mentors contributed positively to the morale and intrinsic motivation of CHOs. However, the mentorship process faced inconsistencies due to the limited availability of mentors, many of whom were senior state-level officials balancing multiple administrative responsibilities. Their competing priorities often resulted in delayed or missed visits, thereby affecting the continuity and effectiveness of the mentorship support.

Discussion

This study contributes valuable empirical evidence on the potential of a structured, hybrid mentorship model—referred to here as the Omni-Channel Mentorship Approach (OCA)—to enhance the performance of Community Health Officers (CHOs) in primary healthcare settings in India. Against the backdrop of the Ayushman Bharat Health and Wellness Centre (now Ayushman Arogya Mandir, AAM) framework, the findings affirm the critical role that ongoing mentorship and supportive supervision play in operationalizing quality healthcare at the last mile.

The statistically significant improvements observed across all six service delivery indicators—particularly in outpatient attendance, NCD screenings, antenatal care check-ups, and community outreach activities—demonstrate that CHOs can serve as effective mid-level service providers when empowered through sustained, context-specific capacity-building efforts. The sharp decline in drug stock-out days also reflects enhanced administrative efficiency resulting from structured mentor guidance.

The study validates that structured, responsive mentorship significantly improves CHO performance across clinical, administrative, and community domains. These findings resonate with existing literature affirming the positive impact of mentoring in health systems strengthening. 14,15 Mentoring as a capacity-building strategy has demonstrated effectiveness in Kenya, Ghana, and Bangladesh, where frontline health workers achieved greater accuracy in diagnosis, referral, and adherence to treatment guidelines.16

Virtual sessions followed by field visit support made mentoring more cost effective. Also, CHOs could connect to their mentors by phone for more clarification when and where required. The integration of digital mentoring platforms in this study aligns with recent calls for hybrid capacity-building models in post-COVID health systems.14,15 Virtual mentoring reduced logistical costs and increased reach. However, physical visits remained essential to contextualize learning and validate practice changes. This dual model enhances scalability and sustainability, especially in remote districts.

Alignment with Indian Public Health Priorities

These findings are highly relevant to the current health system reform efforts in India, which emphasize comprehensive primary healthcare, task-shifting, and community engagement as strategic pillars under the National Health Policy (NHP) 2017. The AAM model is intended to address India's dual burden of disease through expanded access to preventive and promotive services. However, as highlighted by multiple implementation assessments,16,17,18 frontline health workers—including CHOs—often lack the real-time mentorship and decision-making support required to translate training into sustained service delivery.

The success of the OCA in this study aligns with earlier evaluations of mentoring models implemented under the Reproductive, Maternal, Newborn, Child, and Adolescent Health (RMNCH+A) strategy and the National Tuberculosis Elimination Program (NTEP). For example, Chauhan et al. (2020)13 found that structured supportive supervision contributed to improved adherence to treatment guidelines and better health outcomes. Similarly, the Nurse Mentoring Programme in Uttar Pradesh led to significant reductions in perinatal mortality through better clinical practice.19

What sets this study apart, however, is the integration of digital and in-person mentoring, enabling both flexibility and depth. In rural contexts like Bihar, where health infrastructure is often fragmented and human resources overstretched, this model offers a scalable and cost-efficient alternative

to traditional training programs that require significant downtime and travel.

Implications for Policy, Practice and Research

On the policy front, the evidence strongly advocates for the institutionalization of structured mentorship within India's primary healthcare system, with standardized toolkits, and integration of mentorship indicators into national quality assurance and health information systems. To ensure consistency and continuity, dedicated mentorship cadres should be established at both the block and district levels, with clearly defined roles, responsibilities, and accountability mechanisms. These cadres can function as an embedded layer of supportive supervision within the existing human resource architecture. Digital health platforms such as eSanjeevani and TeleMANAS offer scalable opportunities for virtual mentoring and should be leveraged through policy support and investment in digital infrastructure.

In practice, this study reinforces the value of continuous, supportive supervision in enhancing CHO performance, strengthening community linkages, and improving service delivery outcomes at the last mile. Mentorship must be viewed not merely as a supervisory tool but as a strategic mechanism to nurture professional growth, team cohesion, and health system responsiveness in low-resource settings. Furthermore, there is a compelling need to develop standardized mentorship protocols and operational toolkits that align with national service delivery benchmarks under the Ayushman Bharat framework. These resources should be context-specific, culturally appropriate, and adaptable across states. Additionally, integrating mentorship indicators into routine monitoring and quality assurance frameworks—such as Kayakalp, LaQshya, and the Health Management Information System (HMIS)—will ensure that mentoring efforts are tracked, evaluated, and improved over time. Such integration will also facilitate data-driven decision-making at the policy level. However, the effectiveness of any mentorship program hinges on adequate infrastructural support. Therefore, strategic investments in digital connectivity, reliable electricity supply, and transport logistics are essential to enable consistent mentor-mentee interactions, particularly in remote and underserved regions. Beyond the operational aspects, the study underscores the transformative role of mentorship in building the professional identity, confidence, and motivation of CHOs.

From a research perspective, the study underscores the need for larger, multi-site evaluations and longitudinal designs to assess the long-term sustainability and cost-effectiveness of hybrid mentorship models like the Omni-Channel Mentorship Approach (OCA). Further qualitative exploration is also warranted to understand the nuanced experiences of CHOs, mentors, and community stakeholders, and to inform culturally tailored mentorship frameworks. Mentorship emerges not merely as a technical intervention but as a behavioural intervention that fosters trust, accountability, and a sense of purpose among frontline providers. These intangible outcomes should be studied for its contribution for reducing attrition, enhancing job satisfaction, and improving retention of health workers in challenging settings.

Strengths and limitations of the study

This study's key strengths include its mixed-methods design, which combined quantitative service data with qualitative insights, and its real-world implementation within Ayushman Arogya Mandirs, enhancing practical relevance. The innovative Omni-Channel Mentorship Approach demonstrated a scalable, cost-effective model for capacity building, and the inclusion of diverse service indicators provided a comprehensive assessment of CHO performance. However, the study has limitations. It was confined to a single district, limiting generalizability. Reliance on secondary data raises concerns about accuracy, and inconsistency in mentorship sessions due to mentor availability may have affected intervention uniformity. Additionally, external factors such as local festivals could have influenced service utilization during the study period.

Conclusion

This study highlights the effectiveness of the Omni-Channel Mentorship Approach (OCA) in enhancing the performance of Community Health Officers (CHOs) within Ayushman Arogya Mandirs (AAMs) in Bihar. Through structured, blended mentorship—combining virtual interactions with onsite support—the initiative significantly improved key service delivery indicators, including outpatient care, NCD screening, antenatal services, community engagement activities, and drug stock management. Qualitative findings further revealed that mentorship boosted CHO confidence, improved team coordination, and fostered a stronger sense of professional identity and accountability.

Despite contextual limitations, the study provides compelling evidence that sustained, well-designed mentorship interventions can bridge the gap between training and practice, especially in low-resource settings. As India advances its goal of delivering comprehensive primary healthcare under the Ayushman Bharat framework, integrating

structured mentorship into the health system offers a strategic pathway for strengthening service quality, enhancing provider capacity, and ultimately improving health outcomes at the grassroots level. Institutionalizing such mentorship models, supported by policy reforms and digital innovations, is essential to ensure the resilience and responsiveness of primary healthcare delivery nationwide.

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