

Original Research Article

Competency mapping of medical officers in charge in Kerala's family health centers: exploring possibilities and challenges

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ABSTRACT

Background: Kerala's Aardram Mission transformed Primary Health Centres into Family Health Centres (FHCs) to deliver comprehensive primary care. Medical officers in charge (MOICs) are pivotal as clinical leaders and administrators, yet their specific competency requirements in this model remain underexplored. This study, part of a larger competency-mapping initiative by the State Health Systems Resource Centre–Kerala, aimed to identify the roles, responsibilities, and competencies of MOICs to inform targeted capacity-building.

Methods: Competencies were mapped through consultations with health system experts and review of government orders and service delivery frameworks. Using these, in-depth interview guides and observation checklists were developed. Twenty-nine MOICs from randomly selected FHCs across six districts, representing diverse geographic and service contexts, were interviewed. Transcripts were deductively coded against the WHO–ASPHER Competency Framework for the Public Health Workforce in the European Region.

Results: MOICs demonstrated strong competencies in clinical care, disease surveillance, health promotion, and community engagement. They effectively collaborated with local self-governments and other departments, led disaster and outbreak responses, and managed human, financial, and material resources. However, challenges included staff shortages, infrastructure gaps, inconsistent community participation, and limited training in managerial, financial, and administrative skills. Performance appraisal practices were inconsistent, and disaster preparedness knowledge varied. Technology use was growing but constrained by connectivity and equipment gaps.

Conclusion: MOICs in Kerala's FHCs fulfill multifaceted roles spanning clinical service, leadership, public health, and resource management. Strengthening targeted training particularly in administration, financial management, and disaster preparedness—along with systemic support for staffing and infrastructure, can enhance their capacity to deliver comprehensive primary care.

Keywords: Competency mapping, Medical officers, Family health centres, Primary health care, Kerala

INTRODUCTION

India, from the 1940s, as evidenced by the Bhole Committee recommendations, has recognized the

importance of primary health care as a programmatic engine for Universal Health Care.^{1,2} The south Indian state of Kerala, building on its strong foundation of primary health care established in the pre-Independence

era, announced the launch of the Aardram Mission in 2016, aimed at providing comprehensive primary health care by transforming the existing Primary Health centers (PHCs) into Family Health Centers (FHCs). Kerala’s advanced epidemiological transition, necessitated innovations aimed at comprehensive and user-friendly services through FHCs.³⁻⁵

Competent healthcare providers are fundamental to achieving health system goals, making it essential to map the competencies required for health personnel with regard to their assigned roles and responsibilities. Such mapping is particularly important for addressing the unique challenges of regional healthcare settings effectively.^{6,7} By defining context-specific roles and responsibilities, competency mapping helps establish objective performance standards, identify skill gaps, and inform targeted training programs designed to achieve health objectives. Such a competency-based training approach, based on the responsibilities that medical officers are expected to perform enhances accountability—a strategy already incorporated into the government policies in countries like the United Kingdom.⁸

The need to assess the multiple clinical, public health and other competencies of health providers led the State Health Systems Resource Centre–Kerala (SHSRC-K) to undertake a mapping of competencies of various categories of staff at FHCs across the state. The current manuscript, which is a part of this larger study, will focus on the competencies of MOICs at FHCs. The MOICs, as team leaders in FHCs, are required to possess several core competencies for the delivery of comprehensive primary health care. The primary objective of this qualitative sub-study was to explore the roles and responsibilities, and associated competencies of MOICs at FHCs in Kerala.

METHODS

This was a qualitative study employing consultative meetings and in-depth interviews. A series of consultative meetings were held with public health and health system experts including academicians, doctors, staff nurses, lab

technicians, pharmacists, and field staff, to map and document the responsibilities of FHC staff including medical officers as specified in Government Orders (GOs) and service delivery framework of FHCs.

Competencies required to perform these roles and responsibilities were identified, and in-depth interview guides and observation checklists were developed based on the documented responsibilities and competencies. Six districts were randomly selected for the study, namely, Thiruvananthapuram, Ernakulam, Alappuzha, Wayanad, Kannur and Palakkad. One MOIC was interviewed from each of the 12 selected FHCs across these six districts, while ensuring representation from tribal and coastal areas as well as from FHCs at different stages of the National Quality Assurance Standards (NQAS) certification process. All participating MOICs had served as in-charge for a minimum of six months. MOICs who did not provide consent or were on extended leave during the data collection period were excluded. The overall study was conducted from July 2021 to March 2023. Data collection was conducted over one year, from November 2021 to October 2022. Audio recordings were transcribed and deductively coded as per the identified competencies.

For presenting the results, the World Health Organization–Association of Schools of Public Health in the European Region Competency Framework for the Public Health Workforce in the European Region (WHO-ASPHER) has been adapted. Approval for the conduct of the study was obtained from the Institutional Ethics Committee of SHSRC-K, Directorate of Health Services (DHS) and State Mission Director, NHM. Data collection was undertaken with the support of Master of Public Health (MPH) students of Achutha Menon Centre for Health Science Studies.

RESULTS

The subsequent findings are informed by assessments of the expected competencies of MOs, as guided by the WHO-ASPHER Competency Framework for Public Health Professionals in the European Region (Table 1).⁹

Table 1: Competencies expected of MOICs in Kerala as per the categories and sections of the WHO-ASPHER competency framework for public health workforce in the European region.

Main framework categories	Sections of each framework category	Competencies expected of MOs in Kerala
Content and context	Science and practice	Knowledge of disease profile in the community. Measuring, monitoring, and acting on locally relevant health indicators. Management of locally prevalent illnesses.
	Promoting health	Designing and implementing locally relevant health promotion campaigns. Supervision of outreach health promotion initiatives. Ensuring community participation in health promotion. Screening for locally relevant diseases.
	Law, policies, and ethics	Maintaining ethical and professional practice. Locally relevant policy and program development.

Continued.

Main framework categories	Sections of each framework category	Competencies expected of MOs in Kerala
	One health and health security	Identification of risk of zoonosis and liaison with concerned line departments. Ensuring food safety. Health protection of vulnerable communities. Pragmatic response to epidemics/pandemics.
Relations and interactions	Leadership and systems thinking	Leadership and inclusive management
	Collaboration and partnerships	Effective collaboration with the local self-government. Effective collaboration and partnerships with other line departments
	Communication, culture, and advocacy	Effective communication ensuring contextual/cultural adaptability, and for advocacy
Performance and achievement	Governance and resource management	Human resource management. Financial management. Management of the hospital estate. Material management, quality assurance.
	Professional development	Continuing professional development and training. Conduct of performance appraisals.
	Organizational literacy and adaptability	Use of technology in digital health interventions data management. Understanding of public health services.

Content and context

Science and practice

Knowledge of disease profile in the community: MOICs had awareness of the main health needs of the population under the catchment area of the FHCs, which was grounded in an understanding of the disease burden and the recurring demands in the community.

“Chronic conditions like hypertension and diabetes mellitus remain a primary concern in this community. Since this is a coastal area, in addition to common issues such as fever, the most frequently encountered complaints are either skin or musculoskeletal problems”– MOIC, Ernakulam

Measuring, monitoring, and acting on locally relevant health indicators: MOICs had the expertise to monitor the collection of data on locally prevalent communicable diseases as well as non-communicable diseases (NCDs). Data collected through field-level functionaries such as Accredited Social Health Activists, Junior Health Inspectors, Junior Public Health Nurses, and entered on the Integrated Disease Surveillance Portal (IDSP) (now, known as the Integrated Health Information Platform) were analyzed and discussed in weekly FHC-level IDSP meetings. MOICs could analyze disease trends and subsequently take appropriate public health measures.

“Based on the discussions at the weekly IDSP meetings, we chalk out a plan for weekly activities. Each person (staff member) will be entrusted one task and different programmes are planned based on the findings from the field level data”–MOIC, Palakkad.

Management of locally prevalent illnesses: The average daily outpatient flow varied across centers and ranged between 15 and 200 per center. Fever, cough, minor injuries, dressings and pediatric cases contributed majorly to the caseload. MOICs also attended patients presenting complaints related to NCDs. Most of the patients presented with primary healthcare needs, which the MOICs were competent in managing. In cases requiring referrals, MOICs demonstrated sufficient competence in making accurate judgments and promptly referring patients after primary management, while ensuring their safe transfer to the higher health care centers.

“Not every case needs to be referred, but those that do, after initial care, we refer to the nearby Taluk or General Hospital, depending on the speciality needed, as well as the individual preference and convenience of the patient ...and all these cases are recorded in the referral register”–MOIC, Ernakulam.

Promoting health

Designing and implementing locally relevant health promotion campaigns: MOICs were actively involved in health promotion activities, both at the FHC and in the community through public health awareness programs, and community events in collaboration with local organizations. MOICs also conducted health promotion activities during special clinics such as ANC clinics and NCD clinics and in the community on observed health days. They generally subscribed to the view that Information Education and Communication (IEC) activities were needed not just to raise awareness but also to shift the community's focus to preventive and promotive activities.

“We need to increase the community’s awareness...we need to shift the focus to preventive measures. To do this, we make efforts to educate the community through awareness campaigns on special days such as World Dengue Day and Leptospirosis Day”–MOIC, Alappuzha.

“The (health) department has developed and released many promotional videos that we display on screens in OP (Out-Patient) waiting areas.”–MOIC, Wayanad.

Supervising outreach programs: MOICs routinely supervised the field-level health promotion and disease prevention activities in their area of work, directly or through Middle-level Service Providers, the Public Health Nurse and the Health Inspectors.

“We conduct camps in even hard-to-reach areas...sometimes the field staff need to travel by boat to get there”–MOIC, Alappuzha.

Ensuring community participation in health promotion: MOICs fostered community ownership and participation by organizing health promotion activities through “Kudumbasree” (local women’s self-help groups), local clubs and other social organizations. Their efforts were supported by the active involvement of local panchayats, which helped ensure sufficient resources and community participation. With the support of the panchayats, MOICs also ensure that local realities are taken into consideration, such as arranging vehicles for difficult terrains and boats for waterlogged areas when necessary. Initiatives like public announcement systems and patient WhatsApp groups ensured the involvement of relevant sections of the community.

“There are clubs for vulnerable groups and the LSGs are actively involved in the functioning of these clubs - LSGs also provide vehicles and help in camp organisation...when we plan field activities such as school health and adolescents clinics and blood donation campaigns, we need to ensure active participation of youngsters ... to attract them, just a flyer will not be effective ... for this we got an audio system public announcing system”–MOIC, Wayanad.

Some MOICs lamented a vicious cycle wherein patients blamed the health staff and vice versa, attributing this to a lack of awareness about services and programs at the FHCs. Programs lacked consistent monitoring and evaluation, leading many patients to revert to viewing FHCs as centers catering only to day-to-day illnesses such as coughs and fevers. Most of the population remained unaware of the range of programs and services provided at FHCs, and some areas reported poor community participation.

“Peoples mindset should change...they come saying) they have a) cough and just want antibiotics. We have to educate patients and then only can we focus on prevention”–MOIC, Wayanad.

“Even after giving training to volunteers of Arogya sena (Community Health Volunteer Groups established by the government) they are not very active in our area”–MOIC, Kannur.

Screening for locally relevant diseases: Considering Kerala’s high prevalence of NCDs, MOICs conducted routine NCD screening at FHCs and in the community through school health programs and speciality camps for hypertension, diabetes and early detectable cancers, ensuring all age groups and gender are covered.

“Amrutha Arogyam program is conducted every Tuesday for NCDs...it is Aadhaar linked and around 200 people come every week, with most of them being follow-up patients. Some new patients are sent to us from subcentres and most patients are managed here...only those with complications are referred to higher centres”–MOIC, Alappuzha.

“Cancer screening camps are done, and we ask the patients during the pre-check if they have felt any lumps in the breast or if they have any habits such as tobacco use...if they have any symptoms, we refer to higher centres.”–MOIC, Alappuzha.

MOICs at some centres reported shortfalls in cancer screening, which they believed were rarely conducted and, when it was, typically formed part of a panchayat initiative.

“Even though now some initiatives are being implemented, there is no systematic mechanism in place for cancer screening here...it happens only if the panchayat is interested in it”–MOIC, Palakkad.

Law, policy, and ethics

Maintaining ethical and professional practice: MOICs were generally aware of and adhered to the codes of professional practice in their interaction with healthcare providers and beneficiaries. While instances of unethical conduct did occur, they were rare and limited to a small number of individuals.

Locally relevant policy and program development: As convenors of the health working groups of the local self-government (LSG), MOICs played a key role in the development of panchayat projects to address locally relevant health issues. They also played a role in developing local health policies and implementing national and state programs. Some MOs identified prevalent diseases, including zoonotic diseases, and social determinants of health, and used this information to update a Health Status Report for the health standing committee. This ensured that healthcare delivery was evidence-based and that key public health issues were prioritized. However, MOICs showed varying levels of proficiency or engagement in preparing these reports.

One health and health security

Identification of risk of zoonosis and liaising with concerned line departments: MOICs, especially those in zoonotic disease-prone areas, could identify prevalent zoonosis and initiate preventive measures. They also had effective collaborations with all relevant departments such as Animal Husbandry, Dairy development, Agriculture, Forest and Wildlife, etc. Based on local needs and seasonal changes, MOs undertook pre-monsoon preparedness activities, vector control measures, water chlorination, prophylactic doxycycline and source reduction activities.

“Before the rains come, we conduct a doxy (doxycycline) campaign since there are chances for leptospirosis. Even for dengue, we do source reduction. The panchayat cleans the ‘odas’ (road drainage)”–MOIC, Alappuzha.

Ensuring food safety: MOICs were aware of the importance of food safety and related guidelines, as well as their implications for public health and health security. They ensured that local vendors and outlets were inspected before being issued food licenses. Most of the MOICs conducted regular inspections of food outlets, either directly or through public health staff, and took appropriate remedial action when necessary.

“Anyone working in the food industry who approaches us for a license is only given the license after a thorough examination”–MOIC, Thiruvananthapuram.

Health protection of vulnerable communities: Special efforts were made by MOICs to ensure the health of vulnerable communities such as migrants, tribal populations, and coastal communities, including the health needs of the elderly, women, children, individuals with mental health conditions, and those requiring palliative care or rehabilitation. However, certain groups, such as people with disabilities were yet to be addressed.

“We have a line list of all the migrants in our area... We follow up migrants well and go to their area and do prophylaxis and screening activities. They have an association, so we contact them to know of their health issues”–MOIC, Ernakulam.

“We do take many extra efforts, but have not yet been able to do anything for those with disabilities”–MOIC, Palakkad

Pragmatic response to epidemics/pandemics: During the COVID-19 pandemic, MOICs headed the overall response activities in their area, including coordinating Rapid Response Teams (RRTs) that met weekly to plan and implement field visits, teleconsultations, psychological support services, and home monitoring for pregnant women. In addition to the COVID-19 pandemic, even during natural calamities, especially the floods of 2018 and 2019, MOICs ensured that healthcare services,

including immunisation and NCD medication dispersion, remained uninterrupted despite the complete disruption of routine activities.

“During COVID times, we organised a lot of field activities such as home visits, especially for pregnant women who were monitored using handheld dopplers ... psychological support and telemedicine services were also provided to many community members. The JHI was very active. Special consideration was given to palliative care patients and mentally challenged individuals”–MOIC, Kannur

“RRT’s (Rapid Response Teams) were formed during COVID times ... quarantine centres were operationalized and extensive IEC was given. Along with the HI, I did the auditing of COVID deaths. Additionally, special immunisation drives were done for migrants at that time”–MOIC, Ernakulam.

In the event of disease outbreaks, the MOIC was responsible for leading the response from identification to management, as well as implementing activities to prevent future outbreaks. However, in situations demanding advanced skills, such as managing outbreaks or responding to public health emergencies, many MOICs expressed insufficient confidence, indicating the need for additional training and regular updates to their knowledge base. To ensure preparedness for potential disasters, MOs convened Rapid Response Team (RRT) meetings every three months, or when specific risks, such as high tides, were anticipated. Some MOICs were not aware of the need for disaster management plans and the “District Medical Officer's (DMO) Orange Book of Disaster Management (standard operating procedures prepared by Kerala State Disaster Management Authority for the Health Department on disaster response).

Relations and interactions

Leadership and systems thinking

Leadership and inclusive management: MOICs assumed leadership roles within the existing organizational structure. They managed daily activities, addressed staff concerns, and oversaw material management, including maintenance of records and registers. They fostered an inclusive work environment by encouraging all staff, regardless of their grades, to participate in improving the workplace. “All the staff are very competent and actively involve themselves in field duties and team meetings ... I give everyone the freedom to voice their opinions. Ego clashes should not come in the way of proper functioning of the centre”–MOIC, Palakkad.

Collaboration and partnerships

Collaboration with local self-government: MOICs maintained good collaborations with the elected representatives in the LSGs. The panchayats, in turn,

were engaged in the routine operations of the FHC, addressing any shortcomings in resources. In most coastal centers, MOICs worked closely with the panchayat to implement disaster management plans and form RRTs. In the event of a yellow alert some of the MOs took special initiatives to rehabilitate patients to schools and community halls with the support of LSGs.

“The LSGs mobilize external funding to engage palliative care patients and intellectually disabled children in income-generating activities, such as umbrella and pen making”–MOIC, Thiruvananthapuram.

Some MOICs reported difficulties in convincing LSG representatives of their specific requirements for patient care.

“LSG’s provide support staff, for eg, our afternoon MO was hired by the panchayat. The panchayat president had to be convinced that additional staff is not a luxury, and this ability to convince only develops with experience. Some panchayats are supportive since they take it as a credit of their legacy that they have added a new MO to a particular institution”–MOIC, Thiruvananthapuram.

MOs proactively collaborated with LSGs and the DMO to mitigate financial and staffing shortages. Despite these constraints, MOs took the additional initiative to raise funds and improve services, particularly in laboratory operations, where resource constraints were most acutely felt.

“Due to limited HMC (Hospital Management Committee) funds, we prioritized upgrading the lab, which significantly boosted HMC revenue”–MOIC, Ernakulam.

Collaboration and partnerships with other line departments: The MOIC also maintained good collaborations with other departments that could directly or indirectly affect health, such as water and sanitation, nutrition and animal and plant health line departments. Depending on the district, MOICs outsourced biomedical waste management to the designated agencies such as Indian medical association goes eco-friendly (IMAGE) and Kerala enviro infrastructure Ltd. (KEIL). At some centers, MOIC appeared to lack the management skills necessary for proper waste management.

MOICs are responsible for and ensure timely procurement of drugs and medical equipment as per the needs of the catered population through Kerala Medical Services Corporation (KMSCL). They also collaborated with MOICs of other health centers to allow for redistribution and sharing of medicines among centers as per need.

“At times, we receive more BCG vaccines than needed, and we have to refuse additional supply. In some cases, surplus drugs are provided by panchayats, and when these include short-expiry medicines, we redistribute

them to other institutions. However, some centers, particularly those serving a higher migratory population, face shortages of essential medicines like insulin and other NCD drugs. This is especially challenging when we are required to serve a population far larger than what is officially assigned to us”–MOIC, Alappuzha.

Communication, culture, and advocacy

Effective communication ensuring contextual/cultural adaptability, and for advocacy: Most MOICs fostered positive relationships with both staff and the public, being mindful of local religious and cultural dynamics. This rapport helped them effectively communicate situational challenges at the center to beneficiaries, promote vaccination drives for children, and ensure continued trust and cooperation. “We maintain good relationships with our patients - they are also very understanding and for the most part, do not create any issues when we might run short of drugs like insulin, or when there is a huge crowd and they have to wait for a prolonged period”–MOIC, Ernakulam.

In some areas, MOICs face challenges in service delivery due to communication barriers stemming from strong cultural beliefs in the community, leading to inadequate health-seeking behaviour.

“We face a lot of issues with communication, especially with regards to immunisation and medication adherence for NCD patients, which could be due to poor awareness or cultural differences and we are not able to make the community understand... so we criticize them and they criticize us”–MOIC, Palakkad.

Performance and achievement

Governance and resource management

Human resource management: Most MOICs managed staff, delegated duties and resolved inter-personal conflicts among the personnel reporting to them. Many MOICs coordinated leave schedules amongst themselves to maintain the continuous functioning of the OPD and adjusted planned activities such as outreach camps according to staff availability, though this was not done at all centres, as was evidenced by centres being non-functional due to lack of staff availability.

“There is no evening OP today, since the MO is on leave for today”–MOIC, Kannur.

A persistent challenge in some of the centers was the shortage of staff, particularly pharmacists. In FHCs where there was only one pharmacist, managing e-health entries and dispensing medicines was reportedly difficult, resulting in the neglect of digital entry of data when multiple patients were waiting.

“Our centre functions through e-health, so the pharmacist has to take printouts of prescriptions and dispense medications. Our pharmacist was transferred to the block. The panchayat did appoint a pharmacist on contractual basis, but she got pregnant and had severe hyperemesis, so she is on leave for many days. Printing is difficult so we write and give the prescriptions now since we can't type everything when there are few patients waiting”—MOIC, Ernakulam.

Even though MOs could effectively perform their duties in centers with low caseloads, in centers with a high number of outpatients, MOs struggled to fulfill all the responsibilities required of them due to staff shortage.

“A needs-based assessment of centers is necessary, as those with relatively lower caseloads could function well with the minimum required three MOs, whereas centers with a high number of OP patients struggled to manage both OP and field activities with the same staffing level”—MOIC, Thiruvananthapuram.

MOICs efficiently conducted periodic review meetings, though at varying frequencies. While some centers held only monthly meetings, most reported having weekly IDSP meetings to discuss details of the week's cases and field activities. Staff conflicts, except in serious offenses, were generally reconciled within the center itself.

“We know all the staff... we try to solve any issue that arises... if the issue is serious or if the involved parties are adamant, we proceed with written complaints. There have also been cases where police complaints have been filed. We conduct activities like tours to improve interpersonal relations. We motivate them, cook together, have celebrations and hold team-building events...for example, we recently celebrated Women's Day”—MOIC, Palakkad

Financial management: MOICs managed funds received from various sources, including the National Health Mission (NHM), Hospital Management Committee (HMC) and District Medical Office (DMO). They ensured the strategic allocation and optimal use of these funds, with the support of the administrative staff. Most MOICs demonstrated competence in maintaining cash books and ensuring timely payments of bills. However, additional training in financial management was recognized as a requirement for MOICs with limited experience.

“We feel like newly joined doctors need training since they are scared of audits” – MOIC, Thiruvananthapuram.

Management of the hospital estate: MOICs manage the maintenance of estate property and boundaries. When infrastructure maintenance contracts were issued, MOICs expressed frustration over the poor quality of work and inefficient use of space, driven by contractors prioritizing their profit margins. One MOIC from a coastal region

mentioned that their request for a new building, in order to replace the dilapidated one, has been delayed due to administrative processes. Furthermore, there was limited space for changing rooms or leisure. To address these constraints, MOICs took proactive measures to ensure space is used effectively according to need.

“The FHC is actually functioning in an old building which was one of the palaces of the erstwhile King. It is situated in a huge plot. Thus, it is not always easy to get permission to do repair or renovation works. One side of the boundary wall was damaged in the recent heavy rains, which affects the security of the FHC”—MOIC, Alappuzha.

Material management: MOICs supervised the management of all necessary supplies, including drugs, consumables and vaccines. The drug distribution management system used for managing stocks was primarily handled by the pharmacist for drugs and consumables and the Public Health Nurse (PHN) managed vaccines. In their absence, the MOICs often assumed direct supervision of the supplies. They also instructed pharmacists to report potential shortages of vaccines and drugs to facilitate timely requests for additional supplies. MOICs stayed up to date with the maintenance of essential equipment, stock registers, and the disposal of unusable items. They liaised with approved agencies for the maintenance of medical and other equipment. In some centres, challenges to material management were reported, especially with regards to e-waste.

“Even if we do condemnation there is no one to come and take it (old equipment) it is electrical waste and we have no provision for electric waste disposal... garbage collectors (aakri) don't take it... theres no point in condemning it, because it remains here ... the old tv and computer is still here”—MOIC, Palakkad.

Quality assurance: Some of the MOICs showed a keen interest in quality management programs, which led to many of the FHCs achieving NQAS certification with high scores. MOICs who approached quality assurance with enthusiasm made remarkable and sustainable improvements in the quality of service provided at the FHCs. However, in areas where MOICs viewed quality assurance merely as a duty imposed upon them, sustainability remained an issue.

Professional development

Continuing professional development and training: MOICs were competent in conducting training for other staff and the community. They reported receiving concept training and training on national and state health programs. During the pandemic, online training sessions were provided; however, these were largely ineffective due to the simultaneous demands of managing patient care. MOICs expressed the need for specific training on

procedures envisaged in FHCs, such as IUD insertion. Given that the cases they encountered daily involved non-communicable diseases (NCDs) or common ailments, like fevers, MOICs reported a lack of expertise in other clinical areas and an inability to stay updated with the latest advances in drugs and technology. Some MOICs suggested that, despite receiving training in Kerala Service Rules, NQAS, and ISO standards, further training would be beneficial, particularly for newly appointed MOs who found statutory audit procedures daunting. They highlighted the need for training in team building and administrative skills and proposed induction programs to clarify their roles and draw on past employee experiences. They also emphasized the need for frequent refresher training.

“We have received team building training at SHSRC (State Health Systems Resource Centre) along with panchayat members and also received training from KILA ... we also give our staff such as JPHNs training especially related to immunisation”—MOIC, Ernakulam.

The need for regular in-service training in computer skills was also highlighted, as some centers remained dependent on e-health staff due to difficulties some MOICs encountered with digital data entry. *“Computer use is a problem... We are very slow. E-health staff is still here since we have not learnt it too well. When we shift to something new it is an issue for those who are used to the old routine”*—MO, IDI-7.

In some cases, even though training was received, further support to implement the newly acquired skills was lacking.

“We have received SWAAS training, but have not received the required equipment which will enable us to screen patients”—MOIC, Wayanad.

Conduct of performance appraisals: Formal performance appraisals were not mandatory for regular staff. Although annual appraisals were mandated for National Health Mission (NHM) staff, they were often conducted as a formality, with few consequences for underperformance, as dismissals were rare. These appraisals were generally never carried out for contract staff appointed under the Health Management Committee (HMC). Some medical officers, however, conducted informal performance assessments for their staff and linked these to incentives, primarily in the form of appreciation during meetings or small gifts and certificates. Punitive actions based on appraisals were infrequent.

Organizational literacy and adaptability

Use of technology in digital health interventions: The use of technology in FHCs was largely limited to administrative purposes and e-health services in OPDs. As the implementation of e-health was only partial, it was not yet possible to use it for the entire patient management system. In FHCs where the OP module of e-

health was functional, MOICs were generally well versed in its operation. Despite initial hiccups and resistance to its adoption, MOICs generally reported that they found the system useful and time-efficient once they became accustomed to it. Under the “Nayanamritham” project, unavailability of specialists and poor internet connectivity prevented the sharing of images captured on previously installed mydriatic cameras with linked staff at referral centers.

“The machines at the vision center such as the fundoscope are underutilized and are beginning to deteriorate. Reports haven’t been sent due to internet connectivity issues, resulting in no follow-up or outcome for the patient as only the photo is taken”—MOIC, Thiruvananthapuram.

Data management: Public health data was managed through various portals such as the RCH portal (which provides data on pregnant women, mothers and children), IDSP portal (for communicable diseases), and the SHAILI app and portal (for NCD screening), among others. MOICs play a dual role, supervising these data management systems while also guiding subordinate staff, particularly new recruits, in effectively using the technology.



Figure 1: Mapping of key competencies and challenges of medical officers (MOs) in family health centers (FHCs) in Kerala; framework categories and sections of each adapted from the WHO-ASPHER competency framework for public health workforce in the European region.

DISCUSSION

This qualitative study was conducted using in-depth interviews among 12 MOICs of Family Health Centers in Kerala, India. The world health organization–association of schools of public health in the European region competency framework for the public health WHO-ASPHER was adapted to present the competencies of these medical officers in the context of their practice, relations and interactions, and overall performance and achievement.

A similar study in China identified competencies of technical procedural skills, diagnosis and management, teamwork and administration, communication, professional behavior, and professional values as the ones to possess among doctors in their context.¹⁰ Similarly,

our study found that MOICs in FHCs were competent in the diagnosis and management of commonly presenting complaints, as demonstrated by their out-patient department duties, appropriate referral management, and conduct of special clinics; in their team approach and administrative roles and in their communication and professional conduct. A study by Hertel-Waszak et al emphasized that Medical Officers (MO's) should communicate clearly and courteously when providing explanations and asking questions, and our study revealed that MO's secured rapport with the public by being mindful of local cultural dynamics that enabled them to provide explanations and respond satisfactorily to their questions.¹¹

While the current study found that most MOICs were reasonably efficient in maintaining cash books and ensuring the timely payments, some acknowledged the need for further training in financial management. Kamal et al., reported that financial management was one of the lowest-rated competencies among MOs.¹² Regarding human resource management, our study found that MOICs demonstrated competency in managing staff attendance, delegating human resources, and handling intra- and inter-category conflicts. These findings differ from those of Kamal et al who reported low proficiency in 'knowledge of human resources' among MOs.¹² Another point of contrast between our study and Kama et al is the demonstrated proficiency of MOs in material and drug management.¹²

Formal performance appraisals were not mandatory for regular staff, and there appeared to be limited effectiveness in how appraisals were conducted for contractual staff. The variation in practices across different staff categories and limited punitive measures based on appraisals suggested the absence of robust accountability mechanisms. A similar study in Serbia also identified a pronounced gap in the competency related to performance appraisals and performance assessment.¹³ A study conducted in South Africa found that doctors were often unaware of how many waste bins were filled in their wards or how frequently they were collected. Despite many respondents being aware of the hospital's management policy, they reported not having direct access to healthcare waste management documents.¹⁴ Our study found that while waste management was generally efficient at most centers, some centers experienced infrequent waste collection, with no apparent effort by the MOICs to investigate the underlying issues.

Previous studies indicate that globally, the primary healthcare system plays a crucial role in mitigating the adverse health consequences of disasters at every phase of the disaster management cycle.⁸ Consistent with this, our study found that the majority of MOICs, particularly in coastal communities, effectively assumed this role by establishing rapid response teams (RRTs) and developing disaster management plans in anticipation of alerts. The current study found that MOICs actively conducted outreach programs, including clinics and medical camps, while also overseeing the implementation of state-level

and national-level initiatives. These findings align with previous studies, which have reported that, as part of public health initiatives, physicians were responsible for planning various health camps, performing field visits, and conducting antenatal clinics.^{15,16} This alignment emphasizes the role of MOs in extending healthcare services beyond traditional clinical settings, reflecting their involvement in broader public health efforts. Earlier studies have noted that family doctors dedicate a portion of their time on administrative tasks.¹⁷ Similarly, the present study found that MOICs often handle staff working schedules and record maintenance. However, our study also revealed a considerable shortfall in training for MOICs in administrative skills and team building. Despite this gap, the MOs demonstrated competence in their organizational duties, including leading regular review meetings, a finding consistent with earlier research.¹⁷ Hertel-Waszak et al identified information management as a key work-related competency, which the MOICs in the study demonstrated by effectively disseminating information about available health services to patients and communicating staff shortages to the local self-government and the District Medical Officer.¹¹

Notably, the study also revealed novel responsibilities of MOICs, such as staff training, grievance redressal, hospital estate management, and the preparation of the health status reports—areas that have not been widely recognized in the existing literature. Although the overall findings suggest that the competencies of MOICs are largely situation- and person-dependent, they managed their contexts effectively with the resources available. Their roles extend beyond clinical duties to include leadership, creative problem-solving, health promotion, program coordination, administration, advocacy for vulnerable populations, and resource management, among other responsibilities. The inability of MOICs to fully exercise certain competencies was primarily due to systemic limitations, such as a shortage of human resources relative to the caseload at FHCs, inadequate infrastructure, and administrative delays, among others. MOICs also perceived deficiencies in their managerial skills, financial management and training in team building and administrative tasks.

While these challenges persist, the responsibilities and associated competencies of MOICs are noteworthy and span various dimensions of comprehensive health care. To enhance these competencies, it is important to engage MOICs in role-specific tasks that are within their capacity and to ensure that the entire healthcare team is adequately equipped to assist them in fulfilling their broader duties.

Limitations

This study assessed the competencies of medical officers primarily through self-reported interviews with MOICs. The absence of patient perspectives may limit the extent to which the findings reflect service users' experiences of these competencies and how these competencies translate into perceived quality of care.

CONCLUSION

This study underscores the multifaceted role of Medical Officers in Charge at Family Health Centres in Kerala, highlighting their clinical expertise, leadership in community health, and ability to navigate diverse administrative and managerial responsibilities. While MOICs demonstrated strong competencies in service delivery, health promotion, and collaboration with local stakeholders, persistent challenges such as staff shortages, infrastructure limitations, and insufficient training in financial and administrative domains constrain their effectiveness. Strengthening systemic support and introducing structured, competency-based training particularly in managerial, financial, and disaster preparedness skills will be critical to enhancing their capacity to deliver comprehensive, people-centred primary care. Investing in the continued development of MOICs is essential to sustain the gains of Kerala's FHC model and advance the state's vision of universal health coverage.

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