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Original Research Article

Convergence of frontline nutrition and health workers in tribal communities of Maharashtra: a cross-sectional mixed-methods study

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ABSTRACT

Background: In India, despite decades of targeted nutrition and health programmes, progress on child malnutrition has been uneven and fragmented. Achieving sustained improvements in malnutrition requires multi-sectoral convergence at all levels. Institutionalizing convergence between ICDS and health sectors is essential to amplify the impact. POSHAN Abhiyan launched in 2018 was a landmark step towards institutionalizing convergence and amplified shared platforms like VHSND and joint collaboration between frontline workers.
Methods: This mixed-method study was conducted from November 2023 to October 2024 in two tribal dominated blocks in two districts of Maharashtra. A structured questionnaire was used to collect information about the convergence role and mechanisms among FLWs of ICDS and health department from AWWs. Focus group discussions with ASHAs and in-depth interviews with ANMs, were also conducted to understand their role and perspective on convergence between ICDS and health at the village level.
Results: Findings show the VHSND platform is routinely convened and often meets duration norms, with effective case-based collaboration for referral and high-risk follow-up. However, structured joint counselling is infrequent, joint training and supervisory visits are rare. Community governance mechanisms like VHNSCs remain largely inactive and uneven micro planning undermine service quality of nutritional interventions.
Conclusions: Policy and program actions should prioritize enforcing joint-cadre, counselling of service users and effective micro planning going beyond practical issues, institutionalizing routine cross-sector training and supervision and reactivating local governance for accountability to sustain nutrition services among marginalized communities.

Keywords: Cross-sectional study, Convergence, Nutrition interventions, Frontline workers, Scheduled tribes

INTRODUCTION

Malnutrition remains a persistent global challenge, undermining the health, survival and development of millions of children. In 2024, an estimated 150.2 million children under five were stunted worldwide and 42.8 million were wasted, reflecting chronic under nutrition and long-term deprivation.[1] South Asia continues to shoulder a disproportionate share of this burden, with over 30% of children stunted and 14% wasted, the highest rates globally.[2] India's progress has been uneven and exemplifies this regional crisis. In 2024, India ranked 105th out of 127 countries, with a Global Hunger Index (GHI) score of 27.3, placing it in the 'serious' hunger category.[3]

The causes of malnutrition are complex and interrelated, requiring intersectoral convergence. Undernutrition is particularly acute among children from the scheduled tribes (ST) communities, who face structural exclusion, geographical isolation, and weak health infrastructure.[4-8] Addressing malnutrition requires intersectoral approaches rather than fragmented service delivery.[9-11]

In India, nutrition and health programs, including the Integrated Child Development Services (ICDS) and the National Health Mission (NHM) was designed to function

collaboratively.[12,13] The ICDS framework itself, from inception, envisioned coordination with the health sector. Its six core services – supplementary nutrition, preschool non-formal education, nutrition and health education, immunization, health checkups and referral services – were critical to combating undernutrition.[14] Parallelly, the health sector undertook maternal and child health through programmes under the National Rural Health Mission (NRHM, now renamed as NHM), focusing on immunization, antenatal care, and behaviour change communication through outreach activities. The drive towards institutional convergence in nutrition and health system gained momentum in the early 2010s with the introduction of the Village Health and Nutrition Days (VHND), which established fixed monthly sessions for coordinated service delivery, where frontline workers (FLWs) comprising of Anganwadi worker (AWWs), accredited social health activists (ASHAs), auxiliary nurse midwife (ANM) and panchayat representatives jointly provide a comprehensive package of nutrition and health services.[15-17] Yet, scholars and practitioners have long underscored gaps in 'nutrition governance' calling for stronger convergence.[18,19]

A landmark step towards institutionalizing convergence came in 2018, when the Government of India launched the POSHAN Abhiyan (National Nutrition Mission) now restructured as Saksham Anganwadi and POSHAN 2.0. This flagship initiative integrates major nutrition-related schemes under a unified framework by fostering collaboration across ministries to jointly deliver services at the village.[20] POSHAN Abhiyan amplified shared platforms like Village Health Sanitation and Nutrition Day (VHNSD) and emphasized joint planning, execution and reporting between ICDS and health departments. Under this initiative, convergence among frontline workers (FLWs) is strengthened through common service delivery platforms, shared tasks and joint accountability.

Against this backdrop, this study was undertaken primarily to understand the extent to which the FLWs – AWW, ASHA and ANM – converges to provide nutritional services to tribal communities. Understanding the enablers and barriers to such convergence provides evidence for strengthening programme design and the last mile delivery.

METHODS

This mixed-method cross-sectional study was conducted between November 2023 to October 2024. The ethical approval for the study was given by the Institutional Ethics Committee for Human Research, Visva-Bharati University. The study focused on the two selected blocks from the ST dominated Nashik division of Maharashtra. Of the six administrative divisions of Maharashtra, this division has the highest proportion of ST population. Nashik division consists of five districts, of which two – Nashik and Ahmednagar – were randomly selected for the study. Within each of these districts, the block with the highest tribal population was selected. The selected blocks are Peth in Nashik district with a tribal population of 96% and Akole in Ahmednagar district with 48% tribal population.

The scope of the study is limited to understanding the convergence between the AAA (AWW-ASHA-ANM) triad. As nutritional interventions are usually delivered by Department of women and child (WCD) through Anganwadi centres (AWCs), a structured questionnaire was used to collect information of convergence from AWWs. And with FLWs of the Department of health and family welfare (DoHFW) – ASHAs and ANMs – focus group discussions (FGDs) and in-depth interviews were conducted respectively. The structured questionnaire captured information for the following variables: demographic profile of the AWWs: includes name, age, education, caste, years of working as AWW, services provided by the AWC, and specific mechanisms of convergence among FLWs: includes the process of organizing village health, sanitation and nutrition days (VHSNDs), including its planning, service deliver and follow-up, joint home visits, training and supervision. The questions were largely close ended with a few open-ended sections to allow for elaboration where necessary. The schedule was developed in English and then translated and then translated into Marathi to ensure clarity and ease of understanding for the respondent. Pretesting of the tool was conducted in a non-sample tribal area to ensure clarity, relevance and flow of questions, and necessary modifications were made. Participants provided verbal consent before data collection. The FGD guide for ASHAs and interview guides for ANMs, captured detailed information on their roles in delivering services to children and young mothers their coordination mechanism with AWWs in delivering nutritional and health interventions. Both FGDs and interviews were audio-recorded after obtaining informed consent and stored securely in compliance with data protection regulations. All participants were informed of the study objective and of their freedom to participate or withdraw at any point. Care was taken to ensure anonymity during the transcription process.

Study procedure

For the quantitative component, a complete list of AWWs working in rural AWCs were obtained from the block offices. In Akole block, there are 587 AWWs, of which 406 AWWs are assigned to tribal AWCs, so the remaining 181 serving rural non-tribal AWCs were excluded from the list. In Peth block all the AWCs served tribal areas, so all the 256 AWWs were included in the sampling frame. To determine a statistically valid representative sample size, Cochran formula was applied. Using a 95% confidence level and an estimated proportion (p) of 0.5, the formula yielded a sample size of 244, which was rounded up to 250. The final sample was distributed proportionally across the two blocks in accordance with their relative representation in the sampling frame and the AWWs were randomly

selected to reduce sampling bias. For the qualitative component, five focus group discussions (FGDs) were conducted with ASHAs, and five in-depth interviews were carried out with ANMs in each block. For selection of ASHAs and ANMs, consideration was given to select them across different contexts. For instance, FLWs were selected from remote villages as well as those from larger villages located, ensuring a broader representation of perspectives (Table 1). The data was collected by the first author.

Table 1: Details of data collection process.

Implementing department	Type of FLWs and method of data collection	No. of data collection points		
		Akole	Peth	Total
Department of Women and Child Development (WCD)	AWW - survey interview	154	96	250
Department of Health and Family Welfare (DoHFW)	ASHA - FGDs with 6-8 participants	5 (34 participants)	5 (33 participants)	10 (67 participants)
	ANM - in-depth-interview	5	5	10

Data analysis

Quantitative data analyzed using descriptive statistics in statistical package for the social sciences (SPSS) and presented in tabular form. Qualitative data was first transcribed in Marathi and then translated into English, which were then manually coded and thematically analyzed and indexed. Data from both the quantitative and qualitative components were integrated and presented together as per themes identified.

RESULTS

Socio-demographic data

Table 2 presents the socio-demographic characteristics of the AWWs. The majority of participants (59%) were over 40 years of age, with a mean of 42.6 years (range: 23 to 63 years). Educational backgrounds were varied, but all met the qualification criteria of 10th standard required for AWWs. Overall, 74% of the workforce belonged to schedule tribes. Work tenure was considerable, as nearly 75% reported over a decade of service as AWW. The FGDs comprised a mixed group of ASHAs representing diverse demographic backgrounds in terms of age, educational attainment, and years of working. In Akole, 57% of the ASHAs and in Peth all the ASHAs who participated in the study were STs. Additionally, all interviewed ANMs in both blocks were STs.

Services provided by the AWCs

Table 3 summarizes the range of services delivered through the AWCs in the study area. Coverage of maternal and child nutrition intervention was found to be high. All AWWs reported providing supplementary nutrition as per the prescribed norms. Undernourished children are provided with nutrient-rich supplementary nutrition. However, at times supply chain gaps undermine timely and adequate provisioning of supplementary nutrition. ASHA and ANMs reported that THR is dispatched from the district only once a month and the quantity is sometimes inadequate. At times, AWWs bear the burden of arranging supplies themselves. As one ANM from Peth noted *"The AWW often travels on her own to bring the THR is many times don't get timely reimbursed for the expenses."* An ASHA added, *"Sometimes, when there isn't enough ration, the AWW asks me if it can be arranged from VHSND funds. Once I arranged for millet laddoo."*

Village health, sanitation and nutrition days (VHSND)

In this study, frontline workers were asked about their practices of joint planning, execution, and follow-up for VHSNDs, which serve as a critical convergence platform for delivering nutrition services to the community. The key insights provided by AWWs are presented in Table 4.

Joint planning and coordination. The study shows that all AWWs organize VHSND on fixed days, in coordination with ASHAs and ANMs. About 28% of AWWs reported that they hold regular planning meetings with FLWs from the health department, with similar proportions across blocks. When asked about the process of planning, AWWs reported that they have a WhatsApp group, and they communicate through that and don't feel the need of having separate meeting. This sentiment is echoed by the FLWs from health department. As an ANM from Peth explained, *"Before every VHSND, we communicate with AWW and ASHA to decide which families to mobilize and which services need more focus that month."*

Mobilization of beneficiaries: AWWs emphasized that ASHAs play critical role in mobilizing beneficiaries, particularly in remote villages with poor mobile connectivity, as often is the case of tribal areas. ASHAs, often conduct household visits to ensure families are aware of the services that will be provided in the VHSND. As one ASHA from a remote village in Akole explained, *"I go door to door to inform women and families who could not be connected by phone. We plan together so that no beneficiary left out."* Few ANMs noted that while Panchayati Raj institution (PRI) members are formally expected to support VHSND mobilization, however they hardly participate.

Conducting VHSND: The majority of VHSNDs (74%) in the study area are organized at AWC. Eighty-two percent of the VHSND sessions met the government norm of lasting at least four hours. AWWs noted that ASHAs and ANMs are usually present, except when on leave or engaged in other departmental work. ASHAs reported that they are primarily responsible for registration and cross checking the due list of beneficiaries with those attending. As one ASHA from Peth explained, *"During the session, I mainly handle registration and check the due list against the beneficiaries who come."* Some ASHAs also stated that if the VHNSD is not being held at the AWC, attendance of AWWs is sometimes irregular.

Role convergence during VHSND

Given the high levels of vulnerability and undernutrition among tribal children, the study found that AWWs focus on weighing children and recording the measurements in their registers. ASHAs reported that they are occasionally involved in this activity. All AWWs stated that they supply supplementary nutrition to beneficiaries according to eligibility norms. However, ASHAs and ANMs observed that this process is often limited to only distributing food, with minimal counselling or efforts to customize nutrition supplements according to individual children's growth monitoring data or the specific needs of women. Survey results indicate that joint counselling by FLWs is practiced but inconsistently, with fewer than one-third of AWCs conducting it regularly. They noted that nutrition counselling is often general rather than tailored to individual needs. An ASHA from Akole explained, *"We talk to pregnant women and mothers about breastfeeding, diet and other child care practices, but often the women are in a hurry and it is difficult to give advice specific to each family."* An ANM from Peth added, *"Sometimes structured group counselling is hard to organize during VHSND, so we try to give nutrition advice while weighing children, or during ANC."*

Dealing with specific cases of malnutrition: FLWs reported that during VHSND sessions they collaborate to address severe malnutrition in children and high-risk mothers. When a child is identified with severe acute malnutrition (SAM) during growth monitoring, the AWW informs the ANM and ASHA. If the medical officer is present, the child undergoes a full assessment there only. Complicated cases are usually referred to nutritional rehabilitation centres (NRC in the adjacent blocks or to the district hospital) and uncomplicated cases are managed at the AWC through counselling, supplementary nutrition and follow-up by FLWs. As an ASHA from Akole noted, *"When the AWW finds a child with severe malnutrition, she immediately tells me or the ANM, and we work together to make sure the child gets proper attention."* An ANM from Peth added, *"If a SAM child is identified, I examine the child and whenever possible involve the medical officer so that a full assessment is done right away."*

Village health, sanitation and nutrition committee (VHSNC)

VHNSC is a key platform of convergence among FLWs and PRI members and is supposed to act as a mechanism for community-based planning and accountability with regard to nutrition and health interventions. However, survey findings revealed that none of the AWWs had attended a VHNSC meeting in the past year, and most were unaware of the meeting schedules or timings. ASHAs shared that these meetings are very infrequent, and AWWs never attends.

Joint home visits and follow-ups

All AWWs reported collaborating with ASHAs for home visits, especially for high-risk pregnant women, newly delivered mothers and sick children. However, they shared that coordination was often constrained as ASHAs typically conducts home visits in the morning hours while AWWs are required at the AWCs, thus making joint home visits difficult practically. Despite these challenges, FLWs emphasized the importance of providing families with information on the full range of entitlements. As an ASHA from Peth explained, *"When we visit families together, it builds trust - mothers listen more carefully because they see health and ICDS giving the same message."* An ANM from Peth added, *"Joint visits are most useful for high-risk pregnancies and sick children as we can immediately address both health and nutrition needs."*

Joint training of FLWs

Qualitative data from FGDs and in-depth interviews highlighted frontline workers' strong consensus on the need for joint training to strengthen convergence and teamwork. Despite this recognition, participants reported that no joint training had been held in the past year. As one ASHA from Akole observed, *"Joint training helps us to work together as a team. When we learn together, we understand each other's roles better and can support each other in the field."* Similarly, an ANM from Peth emphasized that *"If we are trained together, it makes it easier to communicate and plan our work with AWW. This also avoids confusion and duplication of effort."*

Joint supervision of FLWs

With regard to joint supervision of FLWs, the study collected information specifically related to VHSND supervision. The findings indicate that planned joint supervisory visits are rare. FLWs reported that supervisors are occasionally present when special events are organized during VHSND, such as events during POSHAN maah, but these visits are generally intended to participate in programme activities rather than to provide systematic supervision. As one ASHA from Akole explained, *"We rarely get joint supervision visits. Usually the ANM supervises us, but other supervisors from ICDS or health department, do not come together to observe or guide us."*

Similarly, an ANM from Peth emphasized, *"Joint supervisory visits should happen more often, but due to workload and lack of coordination, it does not take place as planned."*

Table 2: Selected background characteristics of AWWs (in %).

Categories	Akole (n=154)	Peth (n=96)	Total (n=250)
Age (mean)	43.0	42.0	42.6
Education			
Till 10th standard	55.8	57.3	56.4
High school (till 12th)	16.9	17.7	17.2
>Graduation	27.3	25.0	26.4
Caste			
General	14.3	5.2	10.8
OBC	14.4	4.2	10.4
ST	63.6	90.6	74.0
Other (SC/notified tribe)	7.8	0.0	4.8
Number of years working as AWW			
10 or less	27.9	29.1	28.4
11-20	49.3	37.5	44.8
21-30	13.6	30.3	20.0
More than 30	9.1	3.1	6.8
Mean	16.0	17.3	16.5

Table 3: Services provided by AWWs through AWCs (%).

Category of beneficiary and type of service	Akole (n=154)	Peth (n=96)	Total (n=250)
Seven months to 3 years children			
Group monitoring	100.0	100.0	100.0
Supplementary nutrition – take home ration (THR)	100.0	100.0	100.0
Nutrient rich THR (specially for undernourished children)	100.0	100.0	100.0
Immunization (in coordination with ASHA and ANM)	100.0	100.0	100.0
Health referrals	100.0	100.0	100.0
Deworming (in coordination with ASHA and ANM)	98.0	97.0	97.5
Vit A supplementation (in coordination with ASHA and ANM)	89.6	81.3	85.4
Counselling, new mothers on breastfeeding practices	100.0	100.0	100.0
3–6 years children			
Growth monitoring	100.0	100.0	100.0
Supplementary nutrition (hot cooked meal)	100.0	100.0	100.0
Immunization (in coordination with ASHA and ANM)	100.0	100.0	100.0
Health referrals	100.0	100.0	100.0
Informal early childhood education	100.0	100.0	100.0
Nutrition advice to mothers	100.0	100.0	100.0
Pregnant woman			
Supplementary nutrition through THR	100.0	100.0	100.0
Nutritious hot cooked meal (under Dr. APJ Abdul Kalam Amrit Aahar Yojana)	81.0	100.0	90.5
Counselling or nutrition and health (sometimes in coordination with ASHA and ANM)	100.0	100.0	100.0
Health referrals	100.0	100.0	100.0
ANC check-up, IFA supplementation (in coordination with ASHA and ANM)	100.0	100.0	100.0
Lactating others			
Nutritious hot cooked meal till six months of the baby (under Dr. APJ Abdul Kalam Amrit Aahar Yojana)	81.0	100.0	90.5
Counselling or nutrition and health (sometimes in coordination with ASHA and ANM)	100.0	100.0	100.0

Continued.

Category of beneficiary and type of service	Akole (n=154)	Peth (n=96)	Total (n=250)
Counselling on breastfeeding and infant feeding practices (sometimes in coordination with ASHA and ANM)	100.0	100.0	100.0
Health referrals	100.0	100.0	100.0

Table 4: Distribution of AWCs with regard to organizing VHSNDs (%).

Aspects of VHSND	Akole (n=154)	Peth (n=96)	Total (n=250)
Planning meeting held between FLWs for VHSND			
Regularly	29.2	25.0	27.6
Occasionally	46.1	64.6	53.2
Never	24.7	10.4	19.2
Beneficiary due list shared among FLWs	100.0	100.0	100.0
Notify about VHSND (main responsibility)			
AWW and ASHA	96.8	94.8	96.0
Only AWW	1.3	4.2	2.4
Only ASHA	1.9	1.0	1.6
Place of organizing VHSND			
AWC	69.4	80.2	73.6
Health facility	30.5	19.8	6.4
Duration of VHSND			
Less than 4 hours	17.6	18.8	18.0
4 hours or more	82.4	81.2	82.0
Joint counselling on nutrition during VHSND			
Regularly	29.2	25.0	27.6
Occasionally	46.1	64.6	53.2
Never	24.7	10.4	19.2

DISCUSSION

Convergence among FLWs – unevenly layered

POSHAN Abhiyaan's core objective – operationalizing convergence between ICDS and health department at the community level through the AAA (AWW-ASHA-ANM) triad and platforms such as VHSND appears to have taken root at a basic level in the study areas. The routine convening of VHSND sessions at AWCs, the high rate of sessions meeting the four-hour guideline and the near universal notification of beneficiaries by ASHAs and AWWs indicate that the platform for the intersectoral action exists and is largely functional. Yet convergence in practice is layered – platform presence (VHSND scheduling, staffing) is stronger than procedural (structured micro-planning) and systematic (joint training, supervision and data-driven planning) convergence. This multi-tiered pattern mirrors findings from other Indian states where the VHSND platform was in place but fidelity to counselling, governance and supervision norms remain weak.[21,22] In service provision, where roles are clear and clinical urgency is present, FLWs enacted functional task sharing. For instance, AWWs identified growth faltering and SAM, immediately alerted ANMs and ASHAs, and teams ensured assessment, community management or referral as appropriate to the case. Such triage cascades demonstrate that when responsibilities are delineated and stakes are high, frontline teams collaborate effectively, a pattern consistent with program impact analyses showing that explicit task-sharing enables coordinated action in nutrition interventions.[18,23,24]

Planned collaborative structured counselling – the largest missed opportunity

Joint and structured counselling during VHSND was rarely conducted, highlighting a significant implementation gap at the very point intended to drive sustained behaviour change. The fact that fewer than one-third AWCs reported regular joint counselling and most counselling occurring individually during service provision connotes weak fidelity, an observation mirrored from studies conducted in other states where health promotion was the least consistently delivered VHSND component despite robust coverage of immunization and ANC.[21,25,26] This gap is consequential as recent evidence indicates that coordinated counselling by both ASHAs and ANMs is associated with improved maternal practices and service uptake.[27,28]

Joint home visits – inadequate and inconsistent

All AWWs reported undertaking home visits with ASHAs for pregnant women, lactating mothers and malnourished children. While scheduling conflicts limited routine joint visits, teams prioritized them for high-risk cases. FLWs highlighted the added credibility when two cadres visit together, families perceive consistent messaging and greater legitimacy. Such micro-level convergence aligns with national guidance on home-based newborn and child

care with findings from other states.[29] For example, qualitative synthesis of community health workers emphasized that joint household engagement by health and ICDS cadres builds trust reinforces behaviour change more effectively than isolated visits.[28,30,31]

VHNSCs and PRIs – under-utilized platforms for governance

Although VHNSC and PRI members are mandated to support VHSND planning and mobilization, their presence was largely absent in the study areas. This weak governance role is consistent with multi-state assessments documenting VHNSC functioning and under-utilization of untied funds.[32,33] The absence of a functioning VHNSC shifts coordination burdens onto FLWs, undermining community-level ownership of nutrition planning.

Supervision and capacity building - a systematic void

Two systemic weaknesses emerged clearly, firstly the absence of joint training and the rarity of joint supervisory visits. None of the FLWs reported receiving training alongside their health and ICDS counter parts in the prior year, despite national guidelines emphasizing convergence training.[20] Similarly, joint supervisory visits occurred only during health campaigns such as POSHAN Maah, not as routine practice. This finding is not unique to our study. Evaluations of VHSND implementation in Uttar Pradesh and Uttarakhand noted that supervision was largely confined within departmental silos, with little cross-sector coordination.[21,22] The absence of joint capacity building and supervision deprives FLWs of shared learning and feedback, weakening their ability to function as a cohesive team. Evidence from NGO-facilitated interventions suggest that when joint training and supportive supervision are institutionalized, convergence improves significantly.[33,34]

Strengths and limitations of the study

Key strengths of this study include its mixed-methods design and deliberate equity focus. By triangulating a sizeable quantitative survey of 250 AWWs with focused discussions with ASHAs and in-depth interviews with ANMs, the study achieves both statistical breadth and qualitative depth, allowing reliable estimates of service delivery pattern of nutritional interventions alongside rich explanation of underlying practices and constraints. The purposive focus on high-tribal blocks provides an equity-critical lens that enhances the study's policy relevance for underserved and hard-to-reach populations. Collectively, these design choices, strengthen the study's analytical rigor, contextual validity and utility for program and policy decision-making.

CONCLUSION

The findings of our study confirmed that delivering nutritional interventions through VHSND platform facilitates collaboration among FLWs (AWW-ASHA-ANM). While frontline workers engage effectively in case-based collaboration, coordinating home visits for high-risk cases and referrals for severely malnourished children, significant implementation gaps persist. Strengthening nutritional convergence requires consistent enforcement of existing mandates rather than directives. Priorities include ensuring joint counselling sessions by AWW and ASHAs for nutrition behaviour change, fully operationalizing micro-planning for coordinated service delivery and reactivating committees like VHNSC to enhance nutrition governance at community level. Cross-sectoral training and supervision must be institutionalised. Focusing on these systematic priorities can substantially improve the effectiveness of integrated frontline service delivery and accelerate better nutritional outcomes in marginalised communities.

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