Journal of Neonatal Surgery
ISSN(Online): 2226-0439
Vol. 14, Issue 13s (2025)
https://www.jneonatalsurg.com

OPEN ACCESS

Facility-Based Assessment of NCD Service Preparedness at Sub-Centres in Satara District, Maharashtra

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Cite this paper as: Dr. Amit A. Mane, Dr. Supriya S. Patil, Dr. Satish R. Patil, (2025) Facility-Based Assessment of NCD Service Preparedness at Sub-Centres in Satara District, Maharashtra. *Journal of Neonatal Surgery*, 14 (13s), 740-747.

ABSTRACT

Background: Our world is facing a great challenge of tackling burden of non-communicable diseases (NCDs). India has to be prepared for tackling NCDs at both urban and rural populations in coming years. We have initiated many health initiatives towards this goal over the years. However, if the well-equipped and well-prepared health facilities are the basic foundation for any health initiatives. In this study we are going assess how well the sub centers in Satara District are ready to face NCDs.

Material & Methods: This Facility based cross sectional study was conducted in 15 sub centers located in Satara District. Facilities were inspected to assess their readiness for implementation of NPCDCS in Satara district in accordance with IPHS standards and program guidelines. Statistical analysis was carried out using SPSS version 20. Institution ethical committee approved this study. This study was planned to assess their readiness to tackle NCDs through NPCDCS program in Satara district**.**

Results: There were no dedicated staff positions created for program at SC level. However the number of staff working for NCDs was sufficient. Essential medicines required for NCDs were scarce. Also supply of consumables like dip sticks for urine test was not sufficient.

Conclusion: Overall, the Sub Centre faced several challenges but also presented opportunities for improvement. These highlight the need to strengthen public education, standardize care protocols, upgrade infrastructure and equipment, and improve data management systems to effectively tackle non-communicable diseases (NCDs) in the community.

Keywords: *NPCDCS, NP-NCD, PROGRAM EVALUATION, NCD, PROGRAM IMPLEMENTATION, FACILITY PREPAREDNESS.*

1. INTRODUCTION

Non communicable diseases (NCDs) are associated with medical conditions which have longer durations and slow progress. NCDs are also recognized as "chronic diseases" [(1)] . Chronic conditions usually have a duration of minimum of 3 months.[(2)].NCDs are the result of several factors, including genetic, physiological, behavioral, and environmental factors [(3)]

The World Health Organization (WHO) predicts that better control of infectious diseases, rapid urbanization, and an aging population will lead to a rise in NCD-related deaths, reaching an estimated 52 million by 2030.[(4)] . Epidemiological data show that four major chronic illnesses—cardiovascular diseases (CVDs), cancers, diabetes, and chronic respiratory diseases—account for 82% of all deaths caused by non-communicable diseases (NCDs). [(5)] The rising burden of NCDs has also had a serious impact on the social and economic dimensions of sustainable human development. [(6).]

According to the India State-Level Disease Burden Initiative CVD Collaborators - 2016, there were 54.5 million cases of cardiovascular diseases in India. This included 23.8 million cases of ischemic heart disease, 6.5 million cases of stroke, 55 million cases of chronic obstructive pulmonary disease (COPD), 38 million cases of asthma, and 65 million cases of diabetes. [7]

Emerging evidence suggests that an epidemiological transition is under way in rural areas of India and the proportion of disease burden caused by NCDs is steadily increasing. The INDIAB study showed that the prevalence of biochemical abnormalities associated with NCDs was similar in rural and urban areas for some of the states surveyed. [8]

The increasing burden of NCDs among the rural population can be linked to several factors, including unhealthy behaviours and lifestyle choices, low awareness about NCDs and their risk factors, limited health-seeking behaviour, and poor access to quality healthcare. Risk factors for cancer also appear to be more common in rural areas than in urban ones.[9]

To address the growing burden of non-communicable diseases (NCDs), the Government of India launched the National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases, and Stroke (NPCDCS) in 2010. Initially rolled out in 100 districts across 21 states, the programme aimed to prevent and control major NCDs through early detection and screening. It promoted opportunistic screening for conditions like hypertension, diabetes, and certain types of cancer, primarily at District Hospitals and Community Health Centres (CHCs). A key component of the initiative was the establishment of NCD clinics at these local health facilities to support early diagnosis and effective management. Over time, the programme expanded in phases to achieve nationwide coverage, significantly increasing its reach and impact.**[10-11]**

Non-communicable disease (NCD) care is delivered at various levels of the healthcare system. At the District Hospital level, services are offered through NCD clinics, cardiac care units, and cancer care facilities. Community Health Centres (CHCs) provide NCD services through dedicated NCD clinics, early diagnosis and treatment, laboratory support, and referral systems. Primary Health Centres (PHCs) contribute by offering screening services, referrals, and support for early diagnosis and management. At the Sub Centre level, NCD care is delivered through health promotion activities, opportunistic screening, and referral services. **[12]**

The NPCDCS programme was launched in Satara District during 2014–2015, with facility-based screening beginning in the last quarter of that year. In July 2017, population-based screening was introduced in 10 sub-centres within the Satara block. This initiative was expanded to five blocks in January 2018 and further extended to all 11 blocks of the district from April 2018 onward.

So, this study was planned with aim to assess readiness of Sub centers. Data was collected to assess existing services, human resources, physical infrastructure at these facilities working to tackle NCDs through National Program for Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS) program in Satara district**.**

2. METHODOLOGY

In this study 4 Primary health centers were randomly selected from 11 talukas of Satara District. All the sub centers (15) were visited and assessed against the requirements to run NPCDCS program in accordance with IPHS guidelines and Operational guidelines for NPCDCS. All the necessary permissions were taken from the concerned authorities before beginning of our study. This study was approved by Institutional Ethics Committee. Collected data was feed in Microsoft excel (Microsoft® Excel® 2021 MSO (Version 2502 Build 16.0.18526.20168) 64-bit) . Data was analysed using IBM SPSS 20 software (IBM Corp. Released 2011. IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp). Descriptive statistics, Chi square test, unpaired t test, etc. was used.

3. OBSERVATIONS AND RESULTS

Among the 15 sub centers assessed average OPD timing was 3.96 hours with minimum of zero to maximum of 5 hours.

Table 1 - Staff Pattern at SC

Facility (n)	Facility type	Posts	Per guideline post	Sanctioned posts	Filled posts	Filled against sanctioned	Filled against Guidelines
SC (15)	SC	CHO	0	15	11	93.63	0
		ANM	0	23	17		
		ASHA	0	119	119		
		Total	0	157	147		

The table 1 outlined the staffing pattern at 15 Sub-Centers (SCs). According to the data, there were no posts were allocated as per program guidelines for any staff positions at the SC. However, the number of sanctioned posts exceeded guidelines for Community Health Officers (CHOs) 15 positions, Auxiliary Nurse Midwives (ANMs) 23 positions, and Accredited Social Health Activists (ASHAs) 119 positions. For CHOs, while there were 15 sanctioned posts, 11 were filled. Similarly, for ANMs, out of the 23 sanctioned posts, 17 were filled. In contrast, for ASHAs, all 119 sanctioned posts were filled, indicating full compliance with sanctioned positions. Overall, the staffing pattern at SCs highlighted an overabundance of sanctioned posts compared to guideline recommendations for CHOs and ANMs, while ASHAs were adequately staffed according to sanctioned positions. Out of 157 sanctioned posts 147 were filled resulting in a fulfillment rate of 93.63% against the sanctioned posts.

Table 2 - Availability of instruments and consumables at Sub centers - NCD Related

List of instruments and consumables- NCD Related	**Availability**
Adult weighing scale	14 (93.99%)
Sphygmomanometer (Aneroid)	14 (93.99%)
Stethoscope	14 (93.99%)
Measuring Tape	13 (86.66%)
Height Scale – Stadiometer	2 (13.33%)
Dipsticks for urine test for protein and sugar	6(40.0%)

Among the 15 sub centers visited adult weighing scales, sphygmomanometer and stethoscopes were well-stocked, at 14 (93.99%) of the SCs. Measuring tapes showed a slightly lower availability at 13 (86.66%) SCs. However, there is a notable shortage in height scales (stadiometers), with only 2 (13.33%) SCs having them. The availability of dipsticks for urine tests, assessing protein and sugar levels, stands at 40.0% i.e. 6 SCs. This comprehensive breakdown allows for a clear understanding of the readiness of sub-centers in managing NCD-related health assessments (Table 2)

Table 3 - Urine test for protein and Sugar – availability and dipsticks supply at Sub centers

Question	**Yes**	**No**	**Total**
Availability of urine test for protein and sugar using dip sticks?	9 (60.0%)	6 (40.0%)	15 (100%)
If yes, does instruments for urine test for protein and sugar using dipsticks are provided in sufficient quantity?	8 (88.89%)	1 (11.11%)	9 (100%)

Out of the 15 sub-centers surveyed, 60.0% reported having dipsticks for urine tests, while 40.0% did not. For those with dipsticks available, 88.89% confirmed that the instruments were provided in sufficient quantities, whereas 11.11% indicated an insufficient supply. (Table 3)

Table 4 – Availability of essential Medicines at SC for NPCDCS

Name Of The Disease	**Medicine Name**	**SC(15) n (%)**
Hypertension	**Enalapril**	0
	Ramipril	0
	Lisinopril	0

	Indepamide	0
	Chlorthalidone	5 (33)
	Frusemide	0
	Hydrochlorthiazide	2 (13)
	Aldosterone antagonist	0
	Amlodipine	14 (93)
	Atenolol	3 (20)
	Metoprolol	0
	Isosorbide dinitrate	0
	Glyceryl trinitrate	0
Diabetes	**Metformin**	14 (93)
	Glibenclamide	0
	Glimepiride	1 (7)
	Gliclazide	0
	Insulin Regular	0
	Insulin Intermediate	0
	Insulin Long acting	0
Hyperlipidimia	**Atorvastatin , etc.**	0
	Clofibrate,	0
	Fenofibrate, etc.	0
Stroke	**Aspirin**	0
	Clopidogrel	0
	Streptokinase	0
	rTPA (Alteplase)	0
	Warfarin	0
	Heparin	0

Table 4 provides a detailed overview of medicine availability at 15 Sub-Center. For hypertension management, none of the ACE inhibitors, including Enalapril, Ramipril, and Lisinopril, were available. However, Chlorthalidone, a diuretic, showed availability at 5(33%) SCs, and Hydrochlorthiazide was stocked at 2(13%) SCs. Amlodipine, a calcium channel blocker, was widely available, at 14 (93%) SCs. Among beta blockers, Atenolol was available at 3(20%) SCs , while Metoprolol was not available. In the diabetes category, Metformin, an oral hypoglycemic agent (OHA) from the biguanides class, was available at 14 (93%) SCs. Glimepiride, an OHA from the sulfonylureas class, showed a 7% availability rate, while Glibenclamide and Gliclazide were not available. None of the injectable hypoglycemic agents or lipid-lowering agents, including statins and lipoprotein lipase activators, were stocked. For stroke management, antiplatelet drugs such as Aspirin and Clopidogrel, as well as thrombolytics like Streptokinase and rTPA (Alteplase), and anticoagulants like Warfarin and Heparin, were all unavailable. This detailed assessment underscores significant gaps in medicine availability SCs, particularly for crucial medications related to hypertension, diabetes, and stroke management.

Table 5 – General Facility Observations at Sub Centre

Facility Observation Criteria	Observations	Frequency
Availability of IEC boards displaying information about NPCDCS and NCDs	Yes	4 (26.7%)
Availability of prominent display boards regarding service availability in local language	Yes	5(33.3)
Availability of prominent display boards containing timing and day of clinic	Yes	4 (26.7)
Availability of Standard Operating Procedures (SOP) / Standard Treatment Protocols (STP) /Guidelines etc. regarding NPCDCS and NCD	Yes	4 (26.7)
Availability of Standard Treatment Protocols (STP) Diabetes	Yes	0
Availability of Standard Treatment Protocols (STP) Hypertension	Yes	4 (26.7)
Availability of Operational Guidelines	Yes	0
Availability of separate examination for NCD patients	Yes	3 (20)
Availability of separate NCD Clinic for NCD patients	Yes	0
State of the equipments required for running NCD clinic (Glucometer, BP Apparatus, Stadiomer, Measuring Tape, Weighing Machine)	Not available	1 (6.7)
	All available and in working state	2 (13.3)
	Some instruments are not available but other available and in working state	12 (80)
Number of registers maintained at the facility	Above 3	1 (6.7)
	Below 3	14 (93.3)
Frequency of inspection of NPCDCS records	Once a month	13 (86.7)
	Weekly	2 (13.3)

The table 5 presents a detailed assessment of facility observations at a Sub Centre, focusing on criteria related to the National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases, and Stroke (NPCDCS) and Non-Communicable Diseases (NCDs). Each criterion is accompanied by observations and their corresponding frequencies, allowing for a comprehensive analysis of the facility's performance.

Starting with the availability of Information, Education, and Communication (IEC) boards displaying information about NPCDCS and NCDs, the data reveals a concerning trend, with 73.3% of instances reporting their absence. This suggests a significant gap in public education and awareness initiatives within the facility.

Similarly, the availability of prominent display boards regarding service availability in the local language and containing clinic timing and days shows a lack of adequate provision, with 66.7% and 73.3% of instances reporting their absence respectively. These findings underscore potential challenges in communicating essential healthcare information to the community effectively.

Regarding the availability of Standard Operating Procedures (SOP), Standard Treatment Protocols (STP), and guidelines regarding NPCDCS and NCDs, a majority of instances (73.3%) reported their absence, indicating potential deficiencies in standardized care protocols within the facility.

Notably, there were no instances of Standard Treatment Protocols (STP) for Diabetes or Operational Guidelines available at the Sub Centre, highlighting significant gaps in essential healthcare protocols for diabetes management and facility operations.

Moreover, the availability of separate examination facilities and NCD clinics for NCD patients showed limited provision, with only 20% and none of the instances reporting their presence respectively. This suggests potential challenges in providing specialized care for NCD patients at the Sub Centre.

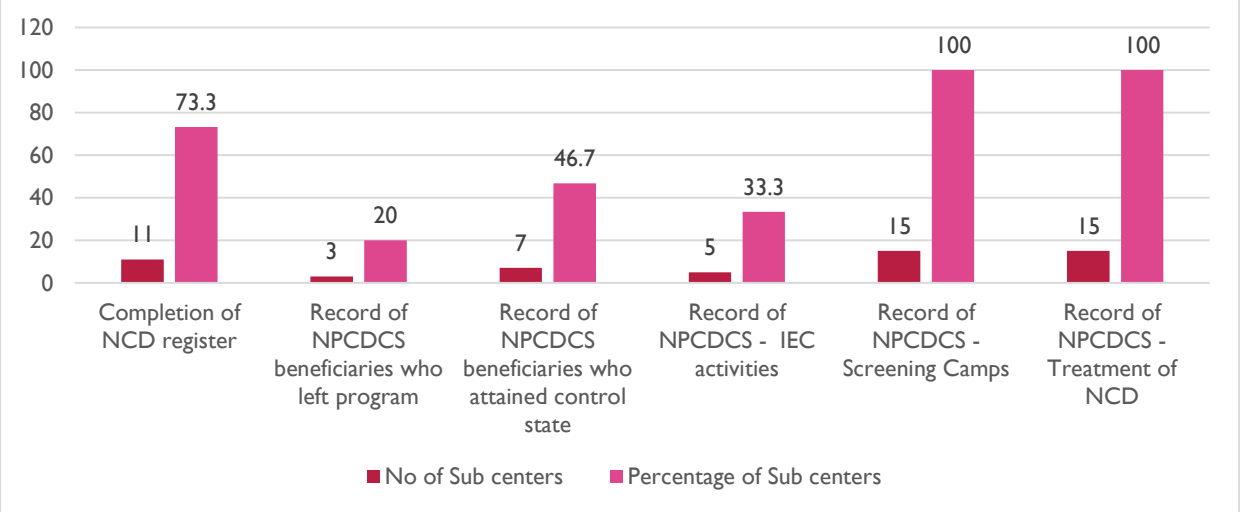
Equipment availability for running NCD clinics also showed room for improvement, with 80% of instances reporting some instruments not available, indicating potential barriers in conducting comprehensive health assessments for NCD patients.

Furthermore, a significant majority of instances (93.3%) reported maintaining registers below the threshold of three, highlighting potential gaps in data management protocols within the facility.

However, there were positive findings regarding the frequency of NPCDCS records inspection, with 86.7% of instances reporting monthly inspections, ensuring regular monitoring and evaluation of program effectiveness.

Overall, the table underscores various challenges and opportunities for improvement within the Sub Centre, emphasizing the importance of enhancing public education efforts, standardizing care protocols, improving infrastructure and equipment provision, and strengthening data management practices to effectively address NCDs within the community.

Figure 1 - Status of record maintenance at Sub centers



The figure 1 shows how well records are maintained at Sub Centres under the NPCDCS programme. It highlights that all 15 Sub Centers (100%) keep records of screening camps and treatment of NCDs. However, only 73.3% (11 centres) have completed the NCD register. Fewer centers maintain records of beneficiaries who left the programme (20%) or who achieved control of their condition (46.7%). Only 33.3% (5 centers) keep records of health education (IEC) activities. This indicates that while basic service records are well-maintained, there is a need to improve documentation of follow-up and health promotion activities.

4. DISCUSSION

In our study the availability of equipment for running NCD clinics showed scope for improvement, as 80% of the cases reported missing instruments. Among the 15 sub centers visited adult weighing scales, sphygmomanometer and stethoscopes were well-stocked, at 14 (93.99%) of the SCs. Measuring tapes showed a slightly lower availability at 13 (86.66%) SCs. However, there is a notable shortage in height scales (stadiometers), with only 2 (13.33%) SCs having themThis suggests potential obstacles in carrying out thorough health assessments for patients with non-communicable diseases.in study by **Ikechukwu A. Orji et al** [(13)] . Most sites (n = 55; 92%) had at least one functional BP apparatus present.

In our study assessment revealed significant gaps in medicine availability SCs, particularly for crucial medications related to hypertension, diabetes, and stroke management **In a study by Jasani et al.** [(14)] Medicines were good quality and adequately available at district level and only 60% CHCs and 20 % subcenters had adequate medicines supply in their study. **In a study by AA mane, SS patil** [(15)] 58 (60.4%) stakeholders reported receipt of sufficient amount of medicines by their facilities. Mean a while 59 (61.5%) stakeholders were satisfied about medicines provided to beneficiaries.

Regarding the presence of IEC boards, showcasing the range and average availability of informational displays related to NPCDCS and NCDs across the surveyed healthcare facilities in our study Sub-Centers (SC) reported a relatively lower but still notable percentage of 26.7%. In a **study by Utsav Raj, et al** [(16)] Forty-eight (74%) PHCs had displayed materials on the intake of healthy foods and avoiding junk food. Warning signs of cancer were displayed at 43 (66%) PHCs.

In our study the provision of dedicated examination facilities and NCD clinics for patients was limited, with only 20% reporting the availability of separate examination spaces and none reporting the presence of dedicated NCD clinics. In a study by **Chandni P Parmar et al** [17] in case of facility of examination room. 35% sub centers have provision of examination room. In a study by **Chandni P Parmar et al** [17]Majority of the facilities (91%) were found to have monthly reporting mechanism for suspected cases which was similar in our study.

In our study The availability of dipsticks for urine tests, assessing protein and sugar levels, stands at 40.0% i.e. 6 SCs **.** Out of the 15 sub-centers surveyed, 60.0% reported having dipsticks for urine tests, while 40.0% did not. For those with dipsticks available, 88.89% confirmed that the instruments were provided in sufficient quantities, whereas 11.11% indicated an insufficient supply. **In a study by J. S. Thakur et al** [18] About 55.6% of health facilities reported urine dipstick testing and urine glucose testing. About 66.7% of the health facilities had blood glucose testing and hemoglobin testing. Urine ketone testing was done in 11.1% of the facilities.

5. CONCLUSION

The sub centers play an crucial role in screening and referral of patients. In this study even though there was adequate staff for work we feel that appointing dedicated NCD staff will definitely help. Sub centers in this study lack the sufficient supply of consumables and essential medications for NCD. There is a need of enhancing public education efforts, standardizing care protocols, improving infrastructure and equipment provision, and strengthening data management practices to effectively address NCDs within the community

6. RECOMMENDATION

Network of sub centers is the building block of our healthcare system. It has been observed that quality of healthcare is better in funded facilities than non funded facilities [19]. Also, the increase in the funding for the facilities have shown increase in quality of health care and satisfaction of patients at facility [20]. In the light of such observations one can assume that better sub centers would be well prepared and capable to tackle NCDs. We also recomment appointing dedicated NCD staff at sub centers.

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