Section: Community Medicine

Original Research Article

HEALTH PROFILE OF BENEFICIARIES ATTENDING A FAMILY ADOPTION PROGRAMME-BASED COMMUNITY HEALTH CAMP IN A TRIBAL AREA OF EASTERN GUJARAT: A CROSS-SECTIONAL STUDY

Sanjay Kumar[2], Aman Damor[3], Arpita Rajgor[1], Pratik G Patel[1]

[1]PG Resident Doctor, Department of Community Medicine, Zydus Medical College and Hospital, Dahod, Gujarat, India.
[2]Dean and CEO, Professor, Department of Community Medicine, Zydus Medical College and Hospital, Dahod, Gujarat, India.
[3]Assistan professor, Professor, Department of Community Medicine, Zydus Medical College and Hospital, Dahod, Gujarat, India.

Received *: 17/05/2026*
Received in revised form *: 10/07/2026*
Accepted *: 24/07/2026*

Corresponding Author:
Dr. Arpita Rajgor,
PG Resident Doctor, Department of Community Medicine, Zydus Medical College and Hospital, Dahod, Gujarat, India.
Email: arpitarajgor2393@gmail.com

DOI: 10.70034/ijmedph.2026.3.216

Source of Support: Nil,
Conflict of Interest: None declared

Int J Med Pub Health
2026; 16 (3); 1349-1355

ABSTRACT

Background: The National Medical Commission (NMC)-mandated Family Adoption Programme (FAP) aims to strengthen community-oriented medical education by integrating undergraduate medical students with rural families while improving access to primary healthcare services. Community health camps conducted under the FAP facilitate early detection of health problems and provide preventive, promotive, curative, and referral services in underserved tribal populations. **Objectives:** To assess the socio-demographic profile, behavioural risk factors, nutritional status, and morbidity pattern among beneficiaries attending a Family Adoption Programme-based community health camp in a tribal area of Eastern Gujarat.

Materials and Methods: A community-based cross-sectional descriptive study was conducted during a comprehensive health camp organized in Kharedi village, Dahod district, Gujarat. Universal sampling was adopted, and all eligible beneficiaries attending the health camp were included. Data were collected using a predesigned, pretested semi-structured case record form. Information on socio-demographic characteristics, behavioural risk factors, anthropometry, clinical examination, laboratory investigations, and morbidities was recorded. Descriptive statistics were expressed as frequencies and percentages. Gender-wise comparisons were performed using the Pearson Chi-square test or Fisher's exact test, with $p<0.05$ considered statistically significant.

Results: A total of 257 beneficiaries were screened, comprising 212 adults and 45 paediatric beneficiaries. Among adults, females constituted 52.4% and 83.0% belonged to Below Poverty Line households. Tobacco use and alcohol consumption were reported by 45.8% and 29.7% of participants, respectively. Anaemia (39.2%), overweight/obesity (40.1%), elevated blood pressure or hypertension (23.6%), central obesity (17.9%), sickle cell disease (10.8%), chronic obstructive pulmonary disease (9.9%), and diabetes mellitus (6.1%) were the major health problems identified. Females had a significantly higher prevalence of Stage 1 hypertension ($p<0.001$) and moderate-to-severe anaemia ($p=0.002$), whereas no significant gender differences were observed for body mass index, waist-to-hip ratio, or random blood sugar levels. Among paediatric beneficiaries, 40.0% of children aged below five years were underweight.

Conclusion: The Family Adoption Programme-based community health camp effectively identified a substantial burden of nutritional disorders, behavioural risk factors, non-communicable diseases, and sickle cell disease in a tribal population. Such community-based outreach activities strengthen early disease detection, health promotion, timely referral, and continuity of primary healthcare services while supporting community-oriented medical education.

Keywords: Primary Health Care, Community Health Services, Morbidity, Mass Screening, Indigenous Peoples.

INTRODUCTION

Community engagement serves as the bedrock of modern medical education, lifting undergraduate training out of textbook theory and grounding it in the complex social, economic, and environmental realities of patient care.[1,2] Historically, Indian medical education recognized this need through the Re-orientation of Medical Education (ROME) program, which aimed to transform public health delivery from a passive, charitable hand out into an active, community-led partnership.[1,4] While the ROME framework gradually phased out, the glaring systemic gaps it sought to mend have only widened. Today, a profound rural-urban healthcare divide persists: nearly 65% of the population lives in rural villages, yet the vast majority of medical infrastructure, specialized clinics, and clinical workforces remain heavily concentrated in urban centers.[1,4] For the rural poor, this structural imbalance—further compounded by low health literacy and a natural hesitation to seek timely care—frequently culminates in delayed diagnoses and preventable health crises.

To systematically bridge these delivery gaps and cultivate a generation of socially accountable, empathetic physicians, the National Medical Commission (NMC) integrated the Family Adoption Programme (FAP) into the undergraduate Competency-Based Medical Education (CBME) curriculum.[2,5] Under this mandatory framework, every Indian Medical Graduate (IMG) adopts three to five families in a rural pocket or urban slum, acting as their dedicated healthcare facilitator and point of first contact over several years of their medical training.[3,5] Crucially, the FAP pushes students past the comfort zone of established Rural Health and Training Centres (RHTCs) into completely unreached, neglected hamlets, taking a tangible step toward true Universal Health Coverage.[2,4]

However, while regular door-to-door family visits are exceptional for tracking chronic illnesses, taking detailed socio-demographic histories, and building longitudinal relationships, they often fall short when families require immediate clinical intervention or specialist care.[3,6] This is precisely where the integration of structured community health camps becomes vital. Field health camps serve as a highly dynamic, localized extension of the FAP framework, led by departments of community medicine.[2,6] They bridge the gap between screening and treatment by bringing diagnostic tools, free medicines, and specialist consultations directly to the doorsteps of adopted communities.[2,3] For the families, these camps break down economic and geographical barriers to care; for the medical students, they offer an invaluable, live classroom to witness logistics, public health administration, and acute primary care management simultaneously.[6]

By analysing this synergy, this study aims to evaluate how structured health camps optimize clinical outcomes for adopted rural cohorts while shaping the practical field competencies of future medical professionals.

MATERIALS AND METHODS

Study Design and Setting

A community-based cross-sectional descriptive study was conducted during a comprehensive health camp organized by the Department of Community Medicine at Kharedi Primary School, Dahod district, Gujarat. The health camp was conducted in collaboration with the local Primary Health Centre, school authorities, and village representatives to provide preventive, promotive, curative, and referral healthcare services to the rural population.

Study Duration

The study was conducted during a comprehensive community health camp. Data collection was completed on the day of the health camp, while data entry, validation, and statistical analysis were carried out within one month following completion of the camp.

Study Population

The study included all beneficiaries attending the health camp during the study period. Individuals of all age groups and both sexes who voluntarily participated in the health camp were eligible for enrolment.

Inclusion Criteria

- Beneficiaries attending the health camp during the study period.
- Individuals providing written informed consent.
- For participants aged below 18 years, written informed consent was obtained from parents or legal guardians.

Exclusion Criteria

- Individuals unwilling to participate.
- Beneficiaries requiring emergency referral before completion of clinical assessment.

Sample Size and Sampling Technique

Universal sampling was adopted, and all eligible beneficiaries attending the health camp were included in the study. A total of **257 beneficiaries** participated, comprising **212 adults** and **45 paediatric beneficiaries**.

Study Tool

Data were collected using a predesigned, pretested, semi-structured case record form developed by the investigators after reviewing relevant literature and national programme guidelines. The study tool included information on socio-demographic characteristics, behavioural risk factors, presenting complaints, medical history, anthropometric measurements, clinical examination findings, laboratory investigations, diagnosis, treatment provided, health education, and referral advice.

Data Collection Procedure

Prior permission was obtained from the concerned authorities before organizing the health camp. Community mobilisation was undertaken through Accredited Social Health Activists (ASHAs), Anganwadi workers, school teachers, and village leaders to maximise community participation.

On the day of the health camp, all beneficiaries were registered and assigned unique identification numbers. Demographic information and relevant medical history were recorded. General physical examination was performed, including measurement of height, weight, blood pressure, pulse rate, waist circumference, and hip circumference using standard techniques. Body mass index (BMI) was calculated as weight (kg) divided by height squared (m^2) and classified according to the **World Health Organization (WHO)** criteria. Waist-to-hip ratio was calculated to assess central obesity.

Point-of-care investigations, including haemoglobin estimation, random blood sugar, and urine examination, were performed whenever clinically indicated. Multidisciplinary consultations were provided by physicians, ophthalmologists, paediatricians, obstetricians and gynaecologists, dentists, nursing officers, interns, and medical social workers. Essential medicines were dispensed free of cost according to standard treatment guidelines. Beneficiaries requiring specialised evaluation or further management were referred to appropriate healthcare facilities.

Health education sessions covering nutrition, personal hygiene, immunisation, oral health, eye care, prevention of non-communicable diseases, tobacco cessation, and healthy lifestyle practices were conducted using interactive discussions and audio visual aids.

Study Variables

The following variables were recorded:

- Socio-demographic characteristics (age, sex, education, occupation, and socioeconomic status)
- Behavioural risk factors (tobacco and alcohol use)
- Anthropometric measurements (height, weight, body mass index, waist-to-hip ratio)
- Clinical parameters (blood pressure, haemoglobin level, random blood sugar)
- Presenting complaints and clinical diagnosis
- Existing comorbidities
- Treatment provided
- Referral status

Statistical Analysis

Data were entered into Microsoft Excel and Categorical variables were summarised as frequencies and percentages. Gender-wise comparisons of anthropometric characteristics (body mass index and waist-to-hip ratio) and clinical characteristics (blood pressure, random blood sugar, and haemoglobin status) were performed using the **Pearson Chi-square test**. **Fisher's exact test** was used wherever the expected cell frequency was less than five. All statistical tests were two-tailed, and a **p-value <0.05** was considered statistically significant.

Ethical Considerations

Administrative permission to conduct the health camp was obtained from the concerned authorities. Written informed consent was obtained from all adult participants, while parental or guardian consent was obtained for participants below 18 years of age. Participant confidentiality and anonymity were maintained throughout the study. Beneficiaries requiring further evaluation or specialised treatment were referred to appropriate healthcare facilities for continuity of care.

RESULTS

Table 1: Socio-demographic characteristics of adult beneficiaries screened during the health camp (N = 212)

Demographic variables	Category	Number (n)	Percentages (%)
Age (years)	≤20	26	12.3
	21–30	30	14.2
	31–40	40	18.9
	41–50	30	14.2
	51–60	34	16
	61–70	30	14.2
	>70	22	10.4
Gender	Male	101	47.6
	Female	111	52.4
Marital status	Married	170	80.2
	Unmarried	42	19.8
Socioeconomic status	Below Poverty Line (BPL)	176	83
	Above Poverty Line (APL)	36	17
Educational status	Illiterate	17	8
	Primary	26	12.3
	Secondary	54	25.5
	Higher secondary	38	17.9
	Graduate	65	30.7
	Postgraduate	12	5.7
Occupation	Professional	27	12.7
	Skilled	17	8

	Semi-skilled	62	29.2
	Unskilled	106	50
Behavioural risk factors			
	Tobacco use	97	45.8
	Alcohol use	63	29.7
	Tobacco and alcohol use	42	19.8
	No addiction	52	24.5
Comorbidities			
	Sickle cell disease	23	10.8
	COPD	21	9.9
	Hypertension (known case)	17	8
	Diabetes mellitus (known case)	13	6.1

Table 1 shows Among the 212 adult beneficiaries, the largest proportion belonged to the 31–40 years age group (18.9%), followed by the 51–60 years age group (16.0%). Females constituted a slightly higher proportion of participants (52.4%) than males (47.6%). Most beneficiaries were married (80.2%) and belonged to Below Poverty Line (BPL) households (83.0%). Nearly one-third (30.7%) were graduates, while half (50.0%) were engaged in unskilled occupations. Tobacco use was reported by 45.8% of participants, and alcohol consumption by 29.7%. Sickle cell disease (10.8%) was the most commonly reported comorbidity, followed by chronic obstructive pulmonary disease (9.9%), hypertension (8.0%), and diabetes mellitus (6.1%).

Table 2: Gender-wise comparison of anthropocentric characteristics among adult beneficiaries (N = 212)

Variable	Male (n=101) n (%)	Female (n=111) n (%)	Total n (%)	p-value
Body Mass Index (kg/m²)				
Underweight (<18.5)	13 (12.9)	27 (24.3)	40 (18.9)	
Normal (18.5–24.9)	39 (38.6)	48 (43.2)	87 (41.0)	
Overweight (25.0–29.9)	21 (20.8)	27 (24.3)	48 (22.6)	
Obese (≥30.0)‡	28 (27.7)	9 (8.1)	37 (17.5)	0.081
Waist-Hip Ratio				
Normal	81 (80.2)	93 (83.8)	174 (82.1)	
High risk	20 (19.8)	18 (16.2)	38 (17.9)	0.5

Table 2 shows the majority of adult beneficiaries had a normal body mass index (41.0%), whereas 18.9% were underweight, 22.6% were overweight, and 17.5% were obese. High-risk waist-to-hip ratio suggestive of central obesity was observed in 17.9% of participants. No statistically significant gender difference was observed in body mass index categories (p = 0.081) or waist-to-hip ratio (p = 0.500).

Table 3: Gender-wise comparison of clinical characteristics among adult beneficiaries (N = 212)

Variable	Male (n=101) n (%)	Female (n=111) n (%)	Total n (%)	p-value
Blood Pressure Status				
Normal	60 (59.4)	50 (45.0)	110 (51.9)	
Elevated BP	30 (29.7)	22 (19.8)	52 (24.5)	
Stage 1 Hypertension	6 (5.9)	31 (27.9)	37 (17.5)	
Stage 2 Hypertension	5 (5.0)	8 (7.2)	13 (6.1)	<0.001
Random Blood Sugar				
Normal (<140 mg/dL)	86 (85.1)	97 (87.4)	183 (86.3)	
Prediabetes (140–199 mg/dL)	10 (9.9)	11 (9.9)	21 (9.9)	
Diabetes (≥200 mg/dL)	5 (5.0)	3 (2.7)	8 (3.8)	0.284
Haemoglobin Status				
Severe anaemia	36 (35.6)	47 (42.3)	83 (39.2)	
Moderate anaemia	20 (19.8)	39 (35.1)	59 (27.8)	
Mild anaemia	45 (44.6)	25 (22.5)	70 (33.0)	0.002

Table 3 shows normal blood pressure was recorded in 51.9% of participants, while 24.5% had elevated blood pressure, 17.5% had Stage 1 hypertension, and 6.1% had Stage 2 hypertension. Females had a significantly higher prevalence of Stage 1 hypertension compared with males (27.9% vs. 5.9%; p < 0.001). Most participants (86.3%) had normal random blood sugar levels, with no statistically significant gender difference (p = 0.284). Severe anaemia was observed in 39.2% of participants, and females had a significantly higher burden of moderate-to-severe anaemia than males (p = 0.002).

Table 4: Socio-demographic and nutritional profile of paediatric beneficiaries screened during the health camp (N = 45)

Variable	Category	Number (n)	Percentage (%)
Age group (years)	<5	15	33.3
	≥5	30	66.7

Gender	Male	23	51.1
	Female	22	48.9
Socioeconomic status	Below Poverty Line (BPL)	35	77.8
	Above Poverty Line (APL)	10	22.2
Nutritional status*	Normal nutritional status	7	46.7
	Underweight	6	40
	Stunting	1	6.7
	Wasting	1	6.7

Table 4 shows among the 45 paediatric beneficiaries, two-thirds (66.7%) were aged five years or older, and males constituted 51.1% of the participants. Most children belonged to BPL households (77.8%). Among children younger than five years, 46.7% had normal nutritional status, whereas 40.0% were underweight, and 6.7% each were stunted and wasted.

Table 5: Pattern of morbidities identified among adult beneficiaries during the health camp (N = 212)

Morbidity	Number (n)	Percentage (%)
Anaemia	83	39.2
Elevated blood pressure/Hypertension	50	23.6
Sickle cell disease	23	10.8
COPD	21	9.9
Diabetes mellitus	13	6.1
Overweight + Obesity	85	40.1
Central obesity (High WHR)	38	17.9

Table 5 shows among the 45 paediatric beneficiaries, two-thirds (66.7%) were aged five years or older, and males constituted 51.1% of the participants. Most children belonged to BPL households (77.8%). Among children younger than five years, 46.7% had normal nutritional status, whereas 40.0% were underweight, and 6.7% each were stunted and wasted.

DISCUSSION

Our study evaluated the socio-demographic characteristics, clinical metrics, and morbidity profiles of 212 adult and 45 paediatric beneficiaries screened during community outreach health camps conducted under the Family Adoption Programme (FAP). Health camps integrated into undergraduate medical curricula like the FAP have increasingly served a dual-purpose intervention: they provide critical experiential, community-based training for medical students while functioning as primary diagnostic safety nets for underserved and low-resource populations.[7]

Socio-Demographic Vulnerabilities and Lifestyle Risks

The baseline characteristics of the adult cohort highlight significant socioeconomic vulnerability, with the vast majority (83.0%) belonging to Below Poverty Line (BPL) households and half (50.0%) engaged in unskilled occupations. Despite these economic constraints, a high prevalence of behavioral risk factors was documented: 45.8% of participants reported tobacco use and 29.7% consumed alcohol.

These findings align closely with real-world FAP field data across India, which demonstrate that economic deprivation does not deter substance use; rather, it compounds the baseline risk for non-communicable diseases (NCDs) in medically underserved rural and peri-urban tracts.[7,8]

The Non-Communicable Disease (NCD) Paradox: Malnutrition vs. Adiposity

A major finding in our adult cohort is the co-existence of over nutrition and under nutrition, reflecting India's on going nutritional transition. While 18.9% of adults were underweight, a staggering 40.1% were classified as overweight or obese (22.6% overweight and 17.5% obese), alongside 17.9% demonstrating central obesity via high-risk waist-to-hip ratios.

Interestingly, recent FAP health camp data from northern India similarly noted a widespread distribution of metabolic risks among camp attendees, showcasing an increasing shift towards adiposity and over nutrition even within socioeconomically marginalized communities.[9]

The lack of a statistically significant gender difference in BMI ($p = 0.081$) and waist-to-hip ratio ($p = 0.500$) in our study suggests that these metabolic shifts are uniformly affecting both male and female adult populations within the community.

This nutritional transition extends to cardiovascular parameters. In this study, elevated blood pressure or clinical hypertension was noted in 23.6% of the adults (24.5% elevated, 17.5% Stage 1, and 6.1% Stage 2). Strikingly, females demonstrated a significantly higher prevalence of Stage 1 hypertension compared to males (27.9% vs. 5.9%; $p < 0.001$). This mirrors broader regional FAP baseline results where community screenings captured high rates of previously undiagnosed or poorly managed hypertension, reinforcing the immense public health utility of outreach camps in detecting asymptomatic NCDs early.[8,9]

Inherited and Chronic Morbidities

Sickle cell disease (SCD) emerged as the single most common chronic morbidity, affecting 10.8% of the adult beneficiaries. In India, the distribution of the sickle cell gene is highly regionalized, showing heavy clustering within tribal communities, tea

garden worker populations, and socioeconomically marginalized groups, with carrier frequencies spanning from 1% to over 40% depending on geography.[10,11] Identifying a 10.8% burden in an unselected camp cohort underscores the vital necessity of point-of-care screening architectures in endemic zones to initiate early management and prevent severe vaso-occlusive crises.[10]

Furthermore, chronic obstructive pulmonary disease (COPD) was noted in 9.9% of the population, which correlates tightly with the high self-reported tobacco usage (45.8%) and potential exposure to biomass fuel combustion in BPL households. Diabetes mellitus was recorded in 6.1% of participants, matching the ranges captured by contemporary random blood sugar screenings in similar FAP baseline cohorts.[8,9]

Anaemia: The Pervasive Public Health Challenge

Anaemia stood out as the most prevalent overall morbidity among adult beneficiaries, affecting 39.2% of the population. Crucially, a profound gender disparity was observed, with females bearing a significantly higher burden of moderate-to-severe anaemia than males ($p = 0.002$).

This finding mirrors decades of public health data in India where maternal, reproductive, and nutritional factors combine to leave women disproportionately vulnerable to iron deficiency and related haemoglobinopathies.[9,11] The high density of severe anaemia in our cohort points toward severe, systemic nutritional deficiencies or a compounding interaction with the endemic sickle cell gene, both of which mandate targeted iron-supplementation and genetic counselling strategies.

Paediatric Health Deficits

Among the 45 paediatric beneficiaries, the data reveals severe public health deficiencies in early childhood development. Among children under the age of five, less than half (46.7%) exhibited normal nutritional status. The remaining children suffered from severe acute and chronic malnutrition: 40.0% were underweight, 6.7% were stunted, and 6.7% were wasted.

These markers are deeply concerning but consistent with recent community-based cross-sectional studies in low-income pockets of India, where overall paediatric malnutrition rates frequently exceed 45%.[12] Early childhood under nutrition has a bidirectional relationship with poverty; it severely compromises physiological development, increases susceptibility to infectious diseases, and perpetuates the intergenerational cycle of poverty.

Limitations

This study has certain limitations. Its cross-sectional design limits the ability to establish causal relationships between risk factors and health outcomes. As the study included only beneficiaries who voluntarily attended the health camp, selection bias may have affected the representativeness of the findings. Some clinical conditions were identified using point-of-care screening tests and clinical examination without confirmatory laboratory investigations. The relatively small number of paediatric participants also limited detailed subgroup analysis. Despite these limitations, the study provides valuable baseline evidence on the health status of a rural tribal population and demonstrates the feasibility of community-based health camps for early disease detection.

CONCLUSION

The study identified a substantial burden of nutritional deficiencies, behavioural risk factors, non-communicable diseases, and sickle cell disease among beneficiaries attending a Family Adoption Programme-based rural health camp. Anaemia, overweight or obesity, hypertension, tobacco use, and chronic respiratory diseases were the major health problems detected. The findings highlight the importance of regular community-based screening, early diagnosis, health education, and timely referral in underserved rural and tribal populations. The Family Adoption Programme provides an effective platform for integrating medical education with community-oriented primary healthcare, facilitating continuity of care and strengthening preventive health services to improve health outcomes in vulnerable communities.

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