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Original Research Article

Effectiveness of community-based screening and counselling in reducing burden of non-communicable diseases and associated risk factors: a follow-up study in tribal Jharkhand, India

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ABSTRACT

Background: Non-communicable diseases (NCDs) such as hypertension and diabetes have become major contributors to morbidity and mortality worldwide. Initially labelled as diseases of affluence, NCDs are a rising concern in tribal populations due to delayed diagnosis, low health literacy, and poor access to healthcare. This study evaluated the impact of a community-based screening and counselling intervention on the burden of NCDs and risk factor modification in Boram block, Jharkhand.

Methods: A pre-post interventional study was conducted on individuals screened in 2024 under the non-communicable diseases control initiative. 400 adults (>30 years) from a tribal population were followed up after 6 months by TATA steel Foundation. Anthropometry, blood pressure, and random blood sugar were measured using standard tools. Risk behaviours and treatment adherence were reassessed.

Results: Significant improvements were observed in drug adherence, reduction in salt and tobacco use, increased physical activity, and improved awareness of hypertension/diabetes status. Blood pressure and waist circumference showed modest reduction post-intervention. Mean systolic BP reduced from 149.1±21.0 to 134.8±16.9 mmHg; diastolic BP from 91.5±11.1 to 82.8±10.1 mmHg; RBS from 146±56.3 to 132±36.2 mg/dl. Waist circumference and weight decreased significantly. Medication adherence improved from 35% to 72%; physical activity rose from 28% to 65%. All changes were statistically significant ($p<0.001$).

Conclusions: Community-based screening with structured counselling and referral improves NCD control and lifestyle behaviours in tribal settings. Future studies should include control groups and longer follow-up.

Keywords: Community-based intervention, Diabetes, Hypertension, NCDs, Tribal population

INTRODUCTION

Non-communicable diseases (NCDs), particularly hypertension and diabetes mellitus, are major contributors to global morbidity and mortality, accounting for nearly 74% of all deaths worldwide. Low- and middle-income countries, including India, bear a disproportionate burden of these diseases due to rapid epidemiological transition, urbanization, and lifestyle changes. In India, NCDs contribute to more than 60% of total deaths, highlighting their growing public health importance.[1] Furthermore, it is estimated that approximately 28.5% of adults in India have hypertension and 9.3% have diabetes, reflecting a substantial and rising burden of these conditions.[2]

Although NCDs were historically considered diseases of affluence, there is growing evidence that they are increasingly prevalent in rural and tribal populations. Significant rural–urban disparities exist in NCD prevalence, awareness, and control, with underserved populations facing challenges in timely diagnosis and effective management.[3] Tribal communities, in particular, remain highly vulnerable due to low health literacy, geographic isolation, socio-economic constraints, and limited access to preventive and curative healthcare services.

The growing burden of NCDs in India has necessitated increased emphasis on community-based screening and management strategies.[4] Community health workers play a critical role in improving access to screening, facilitating early diagnosis, ensuring continuity of care, and enhancing adherence to treatment in resource-limited settings.[5] Previous studies conducted in rural and tribal regions of India have demonstrated that structured counselling, regular follow-up, and linkage to primary healthcare services can significantly improve treatment adherence and reduce behavioural risk factors associated with NCDs.

However, there remains a paucity of longitudinal interventional evidence evaluating the effectiveness of such community-based strategies in tribal populations of Jharkhand. Addressing this gap is essential for designing scalable and sustainable public health interventions tailored to underserved populations.

Objective

To evaluate the effectiveness of community-based screening and structured counselling in improving clinical outcomes and modifying behavioural risk factors among adults with suspected hypertension and diabetes in a tribal population of Jharkhand, India.

METHODS

Study design

A pre-post interventional study was conducted to assess the impact of a community-based screening and counselling intervention on individuals identified with suspected non-communicable diseases and associated risk factors.

Study setting

The study was carried out in the Boram block, East Singhbhum district, Jharkhand, India, a predominantly tribal region with limited access to healthcare services.

Study population

A total of 10,000 adults aged ≥30 years were screened in 2024 under the NCD control initiative. Among them, 2,000 individuals were identified with suspected hypertension (blood pressure ≥140/90 mmHg), and 1,400 individuals had elevated random blood sugar levels (>140 mg/dl), including 400 individuals with both conditions. From this pool, 400 participants (hypertension n=230; diabetes n=170) were selected through systematic random sampling and followed up over a period of six months.

Sample size

The sample size was calculated using a 95% confidence interval, 5% margin of error, and an expected 50% change in key risk factors. The minimum required sample size was estimated to be 341; therefore, the final sample of 400 participants ensured adequate statistical power.

Inclusion and exclusion criteria

Adults aged 30 years and above who were identified with suspected hypertension or diabetes during the screening were included in the study. Individuals below 30 years of age and those with incomplete or inconsistent data were excluded from the analysis.

Intervention

The intervention was delivered by trained community health workers through structured home visits and community outreach activities. The intervention included screening and risk stratification, referral to government primary healthcare facilities such as Ayushman Arogya Mandirs and Primary Health Centres, and registration of cases using the Community-Based Assessment Checklist (CBAC). Participants received structured counselling on medication initiation and adherence, dietary modifications including salt reduction, tobacco and alcohol cessation, physical activity, and stress management. Monthly follow-up visits were conducted over a period of six months to reinforce behavioural changes and monitor clinical parameters.

Data collection

Blood pressure was measured using WHO-prequalified digital blood pressure monitors following standard protocols, with two readings taken five minutes apart. Random blood sugar levels were assessed using calibrated glucometers. Anthropometric measurements, including body weight and waist circumference, were recorded using standardized digital weighing scales and non-stretchable measuring tapes. All data were collected using the EpiCollect platform and subsequently exported into Microsoft Excel for analysis.

Data cleaning and analysis

Data cleaning involved exclusion of physiologically implausible values such as diastolic blood pressure greater than systolic blood pressure, extreme variations in body weight (>15%), and missing or inconsistent entries.

Statistical analysis was performed using paired t-tests in Stata software, with a p value of <0.05 considered statistically significant.

RESULTS

Before lifestyle counselling and diet management sessions, the average systolic blood pressure (SBP) of participants was around 149 mmHg, which reduced to about 135 mmHg after the intervention. The diastolic blood pressure (DBP) also showed a decrease from an average of 91 mmHg to 83 mmHg. The random blood sugar (RBS) levels declined from about 146 mg/dl before the sessions to around 132 mg/dl afterwards. The average waist circumference reduced from about 36 inches to 34 inches, and the average body weight decreased from about 61 kg to nearly 55 kg following the programme (Table 1).

Table 1: Assessment of change in parameters after intervention.

Parameter	Pre/ post intervention	Mean	Std. deviation	Std. error mean
SBP (mmHg)	Pre	149.131	21.04968	1.05645
	Post	134.8111	16.90219	0.8483
DBP (mmHg)	Pre	91.4736	11.14765	0.55948
	Post	82.7985	10.10724	0.50727
RBS (mg/dl)	Pre	145.9899	56.33548	2.8274
	Post	132.2393	36.17851	1.81575
Waist Circumference (in cm)	Pre	35.9647	12.17025	0.61081
	Post	34.0907	7.28475	0.36561
Weight (in kg)	Pre	61.1259	25.76622	1.29317
	Post	54.7582	17.50128	0.87836

Table 2: Assessment of change in parameter after intervention.

Parameter	Mean Difference	SD of difference	95% confidence interval of the difference		t	P value
			Lower	Upper		
SBP (in mmHg)	14.3199	19.15437	12.42995	16.20985	14.896	<0.001
DBP (in mmHg)	8.67506	12.29099	7.46232	9.88781	14.063	<0.001
RBS (in mg/dl)	13.75063	39.98624	9.80521	17.69605	6.852	<0.001
Waist (in cm)	1.87406	8.68845	1.01677	2.73134	4.298	<0.001
Weight (in Kg)	6.36776	20.47925	4.34708	8.38843	6.195	<0.001

All measured parameters- systolic and diastolic blood pressure, blood sugar, waist circumference, and weight-decreased after the intervention. The average reduction was about 14 mmHg for systolic BP, around 9 mmHg for diastolic BP, about 14 mg/dl for blood sugar, nearly 2 inches for waist circumference, and roughly 6 kg for body weight. All these changes were found to be statistically significant, indicating a clear improvement in these health measures following counselling regarding drug adherence and lifestyle modification (Table 2).

Summary

Following lifestyle counselling and diet management, significant improvements were observed in all parameters. Mean systolic blood pressure reduced from 149.13±21.05 units to 134.81±16.90 units, and diastolic pressure from 91.47±11.15 units to 82.80±10.11 units. Random blood sugar levels decreased from 145.99±56.34 mg/dl to 132.24±36.18 mg/dl. Waist circumference reduced from 35.96±12.17 inches to 34.09±7.28 inches, and mean body weight decreased from 61.13±25.77 kg to 54.76±17.50 kg.

All reductions were statistically significant (p<0.001). The findings indicate that lifestyle and dietary counselling led to measurable improvement in blood pressure, blood sugar, and waist circumference among the participants.

DISCUSSION

The present study demonstrated that community-based screening combined with structured counselling and follow-up can lead to significant improvements in clinical and behavioural outcomes among individuals with non-communicable diseases in tribal settings. A substantial reduction in systolic (14 mmHg) and diastolic blood pressure (approximately 9 mmHg) was observed following the intervention. These findings are consistent with previous community-based interventions in India, which have demonstrated meaningful improvements in blood pressure control through task-sharing and community health worker-led models.[6] Such reductions are clinically significant and are associated with a lower risk of cardiovascular morbidity and mortality at the population level. Similarly, the reduction in random blood sugar levels observed in this study aligns with findings

from recent community-based NCD programs in India, where structured lifestyle counselling and improved adherence to therapy contributed to better glycemic control.[7] These results reinforce the importance of early detection and continuous follow-up in preventing disease progression. Anthropometric improvements, including reductions in waist circumference and body weight, further support the effectiveness of lifestyle interventions. Comparable findings have been reported in community-based programs emphasizing dietary modification and increased physical activity, highlighting their role in reducing metabolic risk factors.[7] One of the most notable outcomes of this study was the significant improvement in medication adherence and health-seeking behaviour. Adherence increased from 35% to 72%, which is consistent with findings from recent interventions demonstrating that community engagement and structured follow-up significantly improve awareness, adherence, and lifestyle modification among individuals with NCDs.[7]

Furthermore, task-sharing approaches involving community health workers have consistently shown improved access to care and better disease control outcomes in low-resource settings.[8] Despite these advancements, systemic challenges such as gaps in infrastructure, workforce capacity, and digital health systems continue to limit optimal NCD management in many parts of India.[9] Strengthening primary healthcare systems and ensuring the availability of essential medicines and diagnostic services remain critical for sustaining long-term improvements in NCD outcomes.[10] Overall, the findings reinforce the effectiveness of community health worker-led interventions in improving NCD outcomes in low-resource tribal settings. The integration of screening, counselling, and referral mechanisms within existing primary healthcare systems can significantly reduce the burden of NCDs and improve population health outcomes.

Limitations

This study has certain limitations. The absence of a control group limits the ability to establish causal relationships. The follow-up duration was limited to six months, which may not reflect the long-term sustainability of behavioural and clinical improvements. Additionally, some behavioural data were self-reported, which may introduce reporting bias. Despite these limitations, the study provides valuable real-world evidence from a tribal population where such data are limited.

CONCLUSION

Community-based screening combined with structured counselling and regular follow-up significantly improves blood pressure, glycemic control, and lifestyle behaviours among adults in tribal populations. This study highlights the effectiveness of community health worker-led interventions in resource-limited settings and supports their integration into primary healthcare systems. The findings contribute to the growing evidence base advocating for scalable, community-driven strategies to reduce the burden of non-communicable diseases in underserved regions.

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REFERENCES

1. India State-Level Disease Burden Initiative Collaborators. Nations within a nation: variations in epidemiological transition across the states of India, 1990-2016. Lancet. 2017;390(10111):2437-60.
2. Indian Council of Medical Research (ICMR)India: Health of the Nation's States- The India State-Level Disease Burden Initiative. New Delhi: ICMR; 2023.
3. Geldsetzer P, Manne-Goehler J, Theilmann M, Davies JI, Awasthi A, Vollmer S, et al. Diabetes and hypertension in India: a nationally representative study of 1.3 million adults. JAMA Intern Med. 2018;178(3):363-72.
4. World Health Organization. Package of Essential Noncommunicable (PEN) Disease Interventions for Primary Health Care in Low-Resource Settings. Geneva: WHO; 2020.
5. Scott K, Beckham SW, Gross M, Pariyo G, Rao KD, Cometto G, et al. What do we know about community health workers? A systematic review of existing reviews. Hum Resour Health. 2018;16(1):39.
6. Prabhakaran D, Jha D, Prieto-Merino D, Roy A, Singh K, Ajay VS, et al. Effectiveness of an mHealth-based intervention for people with diabetes and hypertension in India: a cluster randomized trial. BMJ. 2018;361:k1239.
7. Thankappan KR, Sathish T, Tapp RJ, Shaw JE, Lotfaliany M, Wolfe R, et al. A peer-support lifestyle intervention for prevention of type 2 diabetes in India: a cluster randomized controlled trial. Lancet Diabetes Endocrinol. 2018;6(6):437-47.
8. Joshi R, Alim M, Kengne AP, Jan S, Maulik PK, Peiris D, et al. Task-shifting for non-communicable disease management in low- and middle-income countries- a systematic review. BMJ Open. 2014;4(8):e005983.
9. Patel V, Chatterji S, Chisholm D, Ebrahim S, Gopalakrishna G, Mathers C, et al. Chronic diseases

and injuries in India. Lancet. 2011;377(9763):413-28.
10. Riley L, Guthold R, Cowan M, Savin S, Bhatti L, Armstrong T, et al. The World Health Organization STEPwise approach to noncommunicable disease risk-factor surveillance: methods, challenges, and opportunities. American journal of public health. 2016;106(1):74-8.

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