Research brief: Strengthening School-Based Primordial Prevention of Non-Communicable Diseases Among Children in Jodhpur, Rajasthan

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Primordial prevention of Non-Communicable Disease (NCD) among school students in Jodhpur, Rajasthan can be strengthened by integrating structured NCD prevention modules into school curricula and strengthen teacher training under the Ayushman Bharat School Health and Wellness Programme (AB-SHWP) to improve adolescent awareness, support behaviour change, and reduce future NCD burden. Evidence from the NIHR project in Jodhpur indicates that this intervention plan is successful in enhancing students' knowledge, attitudes, and awareness of healthy lifestyle behaviours. However, to translate these gains into sustained behaviour change at scale with continuity, the approach needs to be institutionalised within the education system through curriculum integration, periodic reinforcement activities under Ayushman Bharat School Health and Wellness Programme (AB-SHWP).

Background and rationale

In India, NCDs are estimated to account for 65% of all deaths. To address the high risk of NCDs in India by trying to curb the future burden of NCDs. Schools provide a strategic platform to promote healthy behaviours. Key behavioural risk factors such as unhealthy diet, physical inactivity and tobacco use often originate during adolescence, making early prevention essential. Many school-related factors were seen to influence lifestyle risk factors. School-based preventive approaches can raise students' motivation towards internalisation of health knowledge.

This Project's design aligns with the Ayushman Bharat and National Programme for Prevention and Control of Non- communicable Diseases (NP-NCDs) objective of reducing the burden of NCDs in India. By implementing structured-based interventions led by trained teachers, the project aims to prevent NCDs among children effectively, this approach aligns with Ayushman Bharat- School Health and wellness Program.

The study covered the eight schools with 4 government and 4 private schools across rural and urban areas of Jodhpur with a target population of 490 students aged 13 to 15 or in class 7 to 9. The study assessed students' health behaviours and awareness through individual surveys and group discussions, co-developed intervention strategies with stakeholders to be implemented for 3 months through 2 methods as Teacher Delivered Lectures (TDL) and Problem Based Learning (PBL), and evaluated their effectiveness in improving knowledge, attitudes, and practices related to NCD prevention.

Major findings

Participants understand basic concepts of healthy lifestyles. Most students recognised the importance of physical activity, balanced diet, harmful effects of tobacco but had limited awareness of school health programme. Lack of playgrounds and parks, limited sports facilities, and easy access and taste preference to junk food act as the barrier to the healthy lifestyle. Students face influence of advertisements, social media exposure and peer pressure diverting them from healthy life choices. This concern further increases due to gender norms, socioeconomic barriers and parents busy schedule leading to convenience-based food choices.

The project reached 641 students for the assessment of awareness of NCDs and risk factors, and knowledge and practice of physical activity, healthy diet and tobacco use. The awareness of NCDs was limited in the baseline with only 59% of the students had heard of NCDs while only few students were able to name the NCDs.

Students received the intervention for over 3 months through 2 different methods and post intervention data from 508 students was collected. Following the intervention. Substantial gains were observed in knowledge domains, including awareness of NCDs, communicable diseases, healthy diet, nutrient sources (iron and calcium), and risks associated with junk food, indicating enhanced health literacy among participants. Additionally, dietary behaviours, awareness and attitudes regarding physical activity improved significantly. However, certain behavioural practices, such as screen time duration, sleep practices, and outside food consumption, did not show statistically significant changes, suggesting that behavioural modification was limited despite improved knowledge.

The comparison between teacher-based and problem-based learning revealed that both methods were equally effective, with no statistically significant differences observed for most outcomes.

The endline feedback assessment facilitated a thorough and insightful understanding of their perspectives and experiences regarding the intervention. Notably, 64% of educators found these initiatives improved awareness of healthy diets and substance misuse. Additionally, 36% noted that sharing knowledge with peers was crucial, and 7% highlighted the need for adolescent-specific guidance. When examining student responses, 79% reported positive engagement, particularly in yoga sessions. However, challenges included time management (43%) and concerns about an incomplete syllabus (36%).

Research Brief Direction

The findings demonstrate that school-based behaviour change interventions are feasible, acceptable, and effective in improving knowledge and attitudes related to NCD prevention. However, sustainable behaviour change requires supportive environments beyond the classroom.

Future school health initiatives should move beyond awareness creation and focus on creating enabling environments through curriculum integration, teacher capacity building, parental engagement, supportive school policies, and community participation.

The evidence supports integrating structured NCD prevention modules into existing school health programmes under Ayushman Bharat and related education initiatives.

System Gaps Identified

The study identified several gaps that limit effective NCD prevention among school-going children. Students have limited awareness of national and school health programmes. and inadequate integration of NCD prevention within routine school activities. Schools have insufficient recreational spaces and sports facilities while some schools have shortage of physical education instructors and structured activity opportunities. There is limited monitoring of healthy food availability within school environments. Students have strong influence of unhealthy food marketing and social media on them leading to difficulty in sustaining healthy behaviours despite adequate knowledge. Student have a persistent preference for energy-dense and processed foods. Another variable of parental engagement in promoting healthy lifestyles is essential, as the limited community infrastructure to support physical activity and cultural and economic factors influencing food choices and activity patterns.

Recommended Actions

- For Education Departments it is recommended to integrate NCD prevention and healthy lifestyle education into the school curriculum, institutionalize regular health promotion activities across schools.
- Strengthen teacher capacity through periodic training programmes.
- Establish routine physical activity sessions and sports programmes at schools with promotion of healthy eating through school food policies and nutrition education.
- Schools should strengthen tobacco-free school implementation and include regular health awareness campaigns and student-led activities.
- Parents and communities together should work to encourage healthy eating and active lifestyles at home and support community spaces that promote physical activity among children.

Implementation Priorities

In the short-term, Jodhpur, Rajasthan should scale up teacher training on NCD prevention with introduction of structured health education modules in schools. Schools and health department should work together to improve awareness of government health programmes among students.

The State Health Department, along with Department of Education should integrate NCD prevention into mainstream education policy and to develop state-wide and national school-based NCD prevention frameworks. Programmes and activities could be created to expand parent engagement mechanisms within school health programmes. Longitudinal monitoring of behavioural outcomes and health impacts are recommended for the nation wide long term impact.

Closing Note

The foundation for preventing non-communicable diseases is laid during childhood. This implementation research demonstrates that schools can serve as powerful platforms for shaping healthy behaviours when supported by trained teachers, engaged families, and enabling policies. Scaling up evidence-based school health interventions offers a strategic opportunity to reduce future NCD burden and build a healthier generation of young Indians. Investing in healthy children today is an investment in India's future health and development.