Editorial

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Young Heart Health: A Call for Early Prevention and National Vigilance

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Abstract

Cardiovascular disease is increasingly affecting the younger population in Nepal, representing a dual burden of rheumatic and lifestyle-related disorders. Rheumatic heart disease continues to impose significant morbidity among school-aged children, particularly in underserved regions, while premature ischemic heart disease is rising among young adults due to smoking, stress, physical inactivity, and poor dietary habits. Early, integrated prevention is essential to address this evolving epidemic. Strengthening school-based screening and prophylaxis programs for rheumatic disease, promoting healthy lifestyle behaviors, and incorporating regular cardiovascular risk assessment in educational and occupational settings are key strategies. National policies aligned with WHO noncommunicable disease targets can enhance coordination and sustainability of these efforts. Protecting young heart health is not only a medical responsibility but a national imperative vital for preserving the productivity and future of Nepal's youth.

Keywords: young heart, rheumatic heart disease, premature ischemic heart disease, prevention

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Introduction

In every beat of a young heart lies the rhythm of a nation's future , yet rising cardiac risk in young heart threatens that rhythm. As cardiovascular diseases (CVDs) rise globally, including among younger populations, Nepal faces a shifting epidemiologic burden where both rheumatic and lifestyle-related heart diseases increasingly affect youth. The health of the young heart mirrors the nation's physical, emotional, and socioeconomic well-being.

Traditionally, cardiovascular disease has been perceived as a disease of aging; however, evidence from Nepal and abroad reveals that the pathophysiological roots of heart disease begin in youth. Endothelial dysfunction, autonomic imbalance, low-grade inflammation, and unhealthy coping mechanisms often develop silently, later manifesting as overt cardiac events. Thus, the concept of "young heart health" demands a multidimensional approach — one that integrates biological, psychological, and social determinants.

Cardiac Disease in the Young: The Nepalese Reality

Rheumatic Heart Disease (RHD) continues to be a dominant cause of cardiac morbidity in Nepal's children and adolescents. A nationwide echocardiographic screening of school-attending children reported an overall RHD prevalence of 2.22 per 1,000[1]. Earlier school-based studies from eastern Nepal identified a much higher prevalence of subclinical RHD—up to 13 per 1,000—detected only through echocardiography[2]. These findings underscore persistent gaps in early diagnosis and the reach of antibiotic prophylaxis programs, particularly in rural areas.

Congenital Heart Disease (CHD) contributes significantly to pediatric cardiac admissions. A systematic review and national hospital series over two decades estimated CHD prevalence at 0.7% of pediatric presentations, with atrial and ventricular septal defects being most common[3]. Despite the growth of pediatric cardiac

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services in tertiary centers, late presentation and limited neonatal screening hinder timely intervention.

A new dimension has emerged with the rising incidence of ischemic heart disease (IHD) in young adults. For example, Adhikari et al. reported that among 1,211 STEMI admissions, 10.9% were in patients younger than 45 years; notably, 68.9% of these young patients used tobacco as a risk factor[4]. These young cases are frequently linked with smoking, dyslipidemia, obesity, and family history. Many have single-vessel disease or even non-obstructive coronaries, underscoring a distinct risk profile compared with older cohorts."

At a population level, the Global Burden of Disease Study (2019) identified cardiovascular disease as a leading cause of death and disability in Nepal, with ischemic heart disease the foremost contributor[5]. Alarmingly, a significant portion of these deaths occur in younger adults, reflecting preventable and modifiable risk factors.

Nepal's epidemiologic transition where RHD persists even as premature IHD surges, demands a national strategy that bridges infectious disease prevention and modern lifestyle modification.

How Can We Prevent the Young Heart from Failing?

Preventing Rheumatic Heart Disease: Protecting the Foundations

Rheumatic heart disease (RHD) is one of the few cardiac conditions that is both entirely preventable and tragically persistent in Nepal. Despite decades of progress, studies continue to report significant prevalence among school-aged children, particularly in underserved regions[1,2]. Prevention of RHD requires a multi-tiered approach—primary, secondary, and tertiary—anchored in early detection and sustained community awareness.

Primary prevention focuses on prompt diagnosis and complete antibiotic treatment of Group A streptococcal pharyngitis in children. School-based awareness programs and community-level health education are essential to ensure that sore throats are not dismissed as trivial illnesses. Secondary prevention involves regular intramuscular benzathine penicillin prophylaxis for patients with prior rheumatic fever or early RHD to halt disease progression. This remains the most cost-effective intervention in low-resource settings. Expanding echocardiographic screening programs—such as the national initiative reported by Regmi et al.—can help identify subclinical disease early, before irreversible valvular damage occurs[1].

Finally, tertiary prevention, including timely surgical or percutaneous intervention, should be supported by improved referral networks and financial protection schemes. Sustaining these efforts requires a coordinated policy framework linking schools, community health workers, and tertiary cardiac centers . These goals should align with Nepal's NCD Multisectoral Action Plan (2021–2025), and international frameworks such as the WHO Global Action Plan for the Prevention and Control of NCDs (2013–2030), ensuring sustainable integration of RHD control into primary healthcare.

Preventing Premature Coronary Disease: The Modern Epidemic

While RHD symbolizes diseases of deprivation, premature ischemic heart disease represents diseases of affluence and transition. The growing incidence of acute coronary syndromes (ACS) in individuals under 45 years in Nepal[4] underscores the need for prevention that begins decades earlier than traditional guidelines recommend.

At its core, prevention of young-onset ACS depends on risk factor modification and lifestyle regulation:

- **Physical activity:** Regular aerobic and resistance exercise—at least 150 minutes per week—improves endothelial function, reduces oxidative stress, and enhances insulin sensitivity[6,7]. Urban Nepalese youth face declining activity levels due to academic demands and sedentary employment, highlighting the need for city-level infrastructure promoting movement: bicycle lanes, parks, and workplace fitness initiatives.
- **Stress management:** Chronic psychosocial stress contributes to hypertension, dyslipidemia, and autonomic imbalance[8,9]. Incorporating mindfulness, recreational activities, and social engagement within educational institutions and workplaces can mitigate this risk.
- **Sleep hygiene:** Adequate restorative sleep (>7 hours per night) supports vascular recovery, metabolic stability, and emotional regulation. Sleep deprivation—common among students and professionals—has been linked to early atherosclerosis and arrhythmia susceptibility[10-12].
- **Diet and substance use:** Reducing trans fats, processed sugar, and salt intake while discouraging tobacco and alcohol use remains fundamental. Nutritional literacy among adolescents must become a national curriculum component.

Prevention should not be limited to advice; it must be structurally enabled. Work environments that promote autonomy, physical movement, and mental well-being can lower occupational cardiovascular risk[13-14]. The emerging "bio-psycho-social" model of cardiac prevention recognizes that emotional health, purpose, and connectedness are as vital to vascular resilience as cholesterol control. In the modern Nepali context, protecting the young heart means addressing the pressures of academic competition, digital fatigue, and economic uncertainty with empathy and policy .

Regular Health Check-ups: Detecting Silent Threats Early

A crucial yet underappreciated pillar of prevention is the routine cardiovascular health check-up. Young individuals rarely seek medical evaluation unless symptomatic, allowing silent hypertension, dyslipidemia, and insulin resistance to advance unchecked. Regular screening—blood pressure, fasting glucose, lipid profile, and BMI—can identify modifiable risks years before structural disease develops.

Incorporating annual or biennial screening programs for adolescents and young adults through schools, universities, and workplaces can bridge this gap. Simple tools like handheld echocardiography and community-based blood pressure campaigns can yield outsized benefits in early detection. Beyond diagnostics, such encounters provide opportunities for counseling, motivation, and habit formation—transforming check-ups into points of preventive education.

Conclusion

Heart health in youth is not merely the absence of disease — it is the equilibrium between exertion and recovery, ambition and peace, connection and autonomy. Safeguarding young heart health

is not only a medical mandate but a national priority woven into education, community health, and economic policy. By nurturing active lifestyles, emotional balance, social cohesion, and equitable access to early cardiac care, Nepal can ensure that the heartbeat of its youth continues to drive the rhythm of its progress . Protecting the hearts of the young is protecting the pulse of our nation — a duty that Nepal can no longer defer.

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