

Non-Alcoholic Fatty Liver Disease (NAFLD): A Growing Public Health Challenge - Global, Indian, and Kerala Perspectives

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Abstract: ***Background:** Non-alcoholic fatty liver disease (NAFLD) has emerged as the most common cause of chronic liver disease globally, strongly associated with metabolic syndrome, obesity, and type 2 diabetes. **Objectives:** To review the epidemiology, health impact, and preventive strategies of NAFLD globally, nationally, and within the state of Kerala, India. **Methods:** A narrative review of recent literature, epidemiological data, and public health reports was conducted to synthesize the burden and control measures of NAFLD. **Results:** The global prevalence of NAFLD is approximately 25–30%. In India, estimates range between 25–32% in the general population and exceed 60% in high-risk groups. Kerala shows an even higher burden (35–45%) due to urbanization, sedentary lifestyle, and dietary transitions. The disease contributes significantly to the rise of cirrhosis, hepatocellular carcinoma, and cardiometabolic disorders. **Conclusion:** NAFLD represents a silent epidemic requiring urgent integration into national non-communicable disease (NCD) programs. Lifestyle modification, screening, and community health education are the cornerstones of prevention.*

Keywords: Non-Alcoholic Fatty Liver Disease, NAFLD, Epidemiology, Kerala, India, Prevention, Public Health, Lifestyle Disease

1. Introduction

Non-alcoholic fatty liver disease (NAFLD) encompasses a spectrum of liver disorders ranging from simple steatosis to non-alcoholic steatohepatitis (NASH), fibrosis, and cirrhosis in individuals who consume minimal or no alcohol (Chalasani et al., 2023). The disease is pathophysiologically linked to insulin resistance, obesity, and dyslipidemia — collectively termed the hepatic manifestation of metabolic syndrome.

Initially described in Western populations, NAFLD has now become a global epidemic due to rapid lifestyle transitions, urbanization, and dietary shifts toward high-calorie processed foods (Younossi et al., 2022).

2. Epidemiology

2.1 Global Burden

Globally, NAFLD affects approximately one-third of adults and up to 10% of children (Paik et al., 2023). The prevalence varies by region: Middle East 32%, South America 31%, Asia 27%, North America 24% (Younossi et al., 2022). NAFLD is now the leading cause of chronic liver disease and a major indication for liver transplantation in developed nations.

2.2 Situation in India

India has witnessed a marked rise in NAFLD parallel to its obesity and diabetes epidemic. The estimated prevalence in adults is 25–32%, reaching 40–45% in urban regions (Duseja & Chauhan, 2023). Among individuals with diabetes or obesity, prevalence exceeds 60%. The rural–urban convergence is closing due to dietary transitions and physical inactivity. Alarming, NAFLD is increasingly seen in adolescents and young adults, signaling a potential future health crisis.

2.3 Kerala Scenario

Kerala, a highly urbanized and health-conscious state, paradoxically shows one of the highest NAFLD burdens in India. Regional studies indicate prevalence rates of 35–45% (Jayakumar et al., 2021). Contributing factors include:

- High prevalence of type 2 diabetes (20%),
- Dietary patterns rich in refined carbohydrates and oils, and
- Sedentary habits despite good healthcare access.
- Awareness remains limited, and screening for fatty liver is not routinely incorporated into primary health services.

3. Health Impact of NAFLD

NAFLD is not a benign condition. It can progress to liver fibrosis, cirrhosis, and hepatocellular carcinoma (HCC). In addition, NAFLD is a strong predictor of cardiovascular mortality, surpassing liver-related deaths (Loomba & Sanyal, 2023).

Beyond hepatic outcomes, NAFLD contributes to the burden of non-communicable diseases (NCDs), particularly type 2 diabetes, hypertension, and chronic kidney disease. The economic cost is substantial — direct medical expenses and indirect productivity losses are estimated to exceed billions annually worldwide.

In Kerala, where NCDs already dominate morbidity and mortality, NAFLD adds complexity to the state's public health landscape.

4. Prevention and Control Strategies

4.1 Lifestyle Modification

Lifestyle intervention remains the cornerstone of NAFLD management.

- Dietary modification: Reduction in refined sugars, saturated fats, and fried foods. Emphasis on

Mediterranean-style diets rich in whole grains, vegetables, fruits, and omega-3 fatty acids.

- Physical activity: At least 150 minutes/week of moderate-intensity aerobic exercise or brisk walking.
- Weight reduction: A 7–10% loss of body weight can significantly improve liver steatosis and inflammation.

4.2 Public Awareness and Education

Health education campaigns should integrate NAFLD messages into broader NCD initiatives. Media, schools, and community health centers can promote awareness about liver health and lifestyle risk factors.

4.3 Screening and Early Detection

High-risk groups — obese individuals, diabetics, and those with dyslipidemia — should undergo non-invasive screening using ultrasonography and liver enzyme assessment. Periodic monitoring at primary health centers can enable early intervention.

4.4 Policy and Program Integration

Include NAFLD within the National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS).

Implement community-based fitness and nutrition programs through ASHA and public health nurses.

Encourage school health programs to instill lifelong healthy habits.

4.5 Role of Nursing and Health Professionals

Nurses, as front-line health educators, are pivotal in counseling, screening, and lifestyle guidance. Training nurses in hepatic health promotion can enhance early identification and community prevention.

5. Discussion

The rising prevalence of NAFLD reflects a broader metabolic health crisis. In Kerala, the double burden of prosperity and lifestyle change intensifies this challenge. Although therapeutic drugs are under research, primary prevention through lifestyle change remains the most effective and sustainable approach. Integration of NAFLD into NCD frameworks will ensure policy focus and resource allocation.

6. Conclusion

NAFLD represents a silent but preventable epidemic. Addressing it demands a multidimensional approach combining individual lifestyle change, community engagement, health education, and systemic integration into national health policies. For Kerala, strengthening screening, education, and local research is essential to curb the rising tide of fatty liver disease and its metabolic consequences.

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