

CRITICAL REVIEW ON THE CURRENT STATUS OF INCIDENCE AND PREVALENCE OF DYSLIPIDEMIA IN THE REPUBLIC INDIA

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Article Received on 04 June 2026,
Article Revised on 24 June 2026,
Article Published on 01 July 2026,
<https://doi.org/10.5281/zenodo.21022781>

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How to cite this Article: Dr. B. A. Lohith, *Dr. Suma S. Sadar Joshi, Dr. Shailesh Shetty, Dr. Rohini Purohit (2026). Critical Review On The Current Status Of Incidence And Prevalence Of Dyslipidemia In The Republic India. World Journal of Pharmaceutical Research, 15(13), 153–161.

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ABSTRACT

Background: Dyslipidaemia, defined by abnormal lipid levels in the blood, is a major modifiable risk factor for cardiovascular disease (CVD). In Republic India, the rising burden of non-communicable diseases has placed Dyslipidaemia at the forefront of public health challenges. **Objectives:** To review and synthesize existing literature on the prevalence and incidence of Dyslipidaemia across diverse Indian populations—including urban, rural, and tribal groups—and to highlight demographic trends, associated comorbidities, and epidemiological shifts over the past decade. **Methods:** A comprehensive review of 20 peer-reviewed studies published between 2013 and 2023 was conducted. Sources included population-based surveys, hospital-based records, and national datasets. Studies were selected based on relevance, sample size,

geographic coverage, and inclusion of prevalence/incidence data. **Results:** Dyslipidaemia prevalence varied across populations: urban (38–43%), rural (25–29%), and tribal (18–21%). Notable gender differences were observed, with women exhibiting higher triglyceride and HDL levels. Co-morbidities like diabetes and obesity significantly increased Dyslipidaemia risk. Temporal trends revealed a gradual increase in triglyceride and LDL-C levels over time, especially in urban populations. **Conclusions:** Dyslipidaemia is highly prevalent in Republic India with marked regional, socioeconomic, and demographic disparities. Rising incidence in rural and tribal populations signals the urgent need for early intervention. Integrated strategies focusing on lifestyle, early screening, and public education are essential for risk reduction.

KEYWORDS: Dyslipidaemia, Republic India, Prevalence, Incidence, Urban-Rural, Cardiovascular Risk, Diabetes, Obesity, Lipid Profile.

INTRODUCTION

Dyslipidaemia, characterized by abnormalities in serum lipid levels such as elevated total cholesterol, low-density lipoprotein (LDL), triglycerides, or low high-density lipoprotein (HDL), is a major contributor to the global burden of cardiovascular disease (CVD)^[1] In the Indian context, this burden is compounded by rapid urbanization, changing dietary patterns, increasing sedentary behaviour and the co-existence of traditional and modern risk factors.^[2,3] India presents a unique challenge due to its socio-cultural diversity, wide-ranging dietary practices, and marked urban-rural healthcare disparities. While communicable diseases remain prevalent in many areas, non-communicable diseases (NCDs) like cardiovascular disease have risen sharply. Dyslipidaemia is a significant, modifiable determinant in the pathogenesis of these conditions.^[4,5]

Several epidemiological studies over the last two decades have examined lipid abnormalities in various subgroups of the Indian population, revealing significant variations by region, gender, socioeconomic status, and lifestyle factors. Urban populations tend to exhibit higher levels of LDL and triglycerides, while rural and tribal populations are increasingly affected due to nutritional transitions and limited healthcare access.^[6-9]

Understanding the prevalence and incidence of Dyslipidaemia in different settings across Republic India is essential for planning preventive health strategies and informing policy. This comprehensive review aims to synthesize current evidence from key Indian and global studies to provide an updated overview of the Dyslipidaemia burden and its determinants in the Indian population.

MATERIALS AND METHODS

This study is a narrative review of peer-reviewed articles and reports that investigate the prevalence and incidence of dyslipidemia in Indian populations. A systematic literature search was conducted using databases such as PubMed, Scopus, Google Scholar, and ScienceDirect. Keywords used in the search included: "dyslipidemia," "India," "prevalence," "incidence," "lipid profile," "urban," "rural," and "tribal populations".^[10-13]

Inclusion criteria were

- Studies published between January 2013 and December 2023
- Articles in English
- Studies reporting prevalence or incidence of dyslipidemia in populations of Republic India
- Both hospital-based and community-based studies
- Studies including adults aged 18 years and above

Exclusion criteria included

- Animal studies
- Studies without clear dyslipidemia data or lacking Indian demographic context
- Review articles, editorials, and case reports

A total of 29 studies were initially identified. After screening titles, abstracts, and full texts for relevance and data quality, 20 studies were included in the final review. Data extracted from the studies included:

- Sample size
- Geographic region and classification (urban, rural, tribal)
- Age and gender breakdown
- Lipid profile parameters (total cholesterol [TC], LDL-C, HDL-C, triglycerides [TG])
- Comorbid conditions (e.g., diabetes, hypertension, obesity)

Studies were categorized and analyzed based on population type (urban, rural, tribal), study design, and publication year. Descriptive statistics were applied to summarize prevalence and incidence rates. Observed patterns were synthesized and represented in visual aids.^[14-17]

PRISMA Flow Diagram

Phase	Number of Studies
Records identified (database search)	29
Records screened	29
Full-text articles assessed for eligibility	25
Studies included in final review	20

This approach ensured a comprehensive and unbiased synthesis of the available literature while highlighting gaps for future research.

RESULTS

The review of 20 studies revealed significant heterogeneity in the prevalence of dyslipidemia across different populations in Republic India:

Urban Populations

Urban studies reported a high prevalence of dyslipidemia, ranging between 38% and 43%, with higher triglyceride (TG) and low-density lipoprotein (LDL-C) levels. Increased sedentary lifestyle, poor dietary habits, and rising obesity rates were cited as major contributors.^[10,14,18] Gender analysis indicated women often had higher HDL-C but were also prone to elevated TG, especially post-menopause.^[11,15]

Rural Populations

Rural regions showed a prevalence range of 25% to 29%, which, while lower than urban figures, represents a growing trend due to rapid lifestyle changes and increased caloric intake.^[12,17,19] Rural populations were often characterized by low HDL-C levels and emerging rates of metabolic syndrome.

Tribal Populations

Tribal communities had the lowest prevalence (18%–21%), though studies warned of rising dyslipidemia due to encroaching urbanization, poor nutritional practices, and inadequate healthcare services.^[13,20] These populations typically showed lower levels of total cholesterol and LDL-C but were at increasing risk as traditional diets were replaced by processed foods.

Gender Differences

Across most studies, females exhibited higher HDL-C but were more likely to have elevated triglycerides, especially among older age groups. Male participants frequently showed higher levels of LDL-C and total cholesterol.^[11,15,16]

Temporal Trends

Several longitudinal and hospital database studies noted a gradual increase in mean LDL-C and TG values over the past decade, especially in urban regions^[14, 18, 19] This suggests that without effective intervention, the burden of dyslipidemia may continue to rise.

Associated Comorbidities

A strong association was noted between dyslipidemia and conditions such as type 2 diabetes mellitus, hypertension, and central obesity^[13, 16, 17] Studies conducted in diabetes clinics revealed dyslipidemia prevalence as high as 70%–75% among diabetic patients.

Lipid Parameter Patterns

The most common patterns of lipid abnormality reported were:

- Low HDL-C (most frequent)
- Elevated triglycerides
- High LDL-C
- Elevated total cholesterol (TC)

Visual Summary Tables and Graphs

(1) Prevalence by Population Type

Population Type	Prevalence (%)
Urban	38–43
Rural	25–29
Tribal	18–21

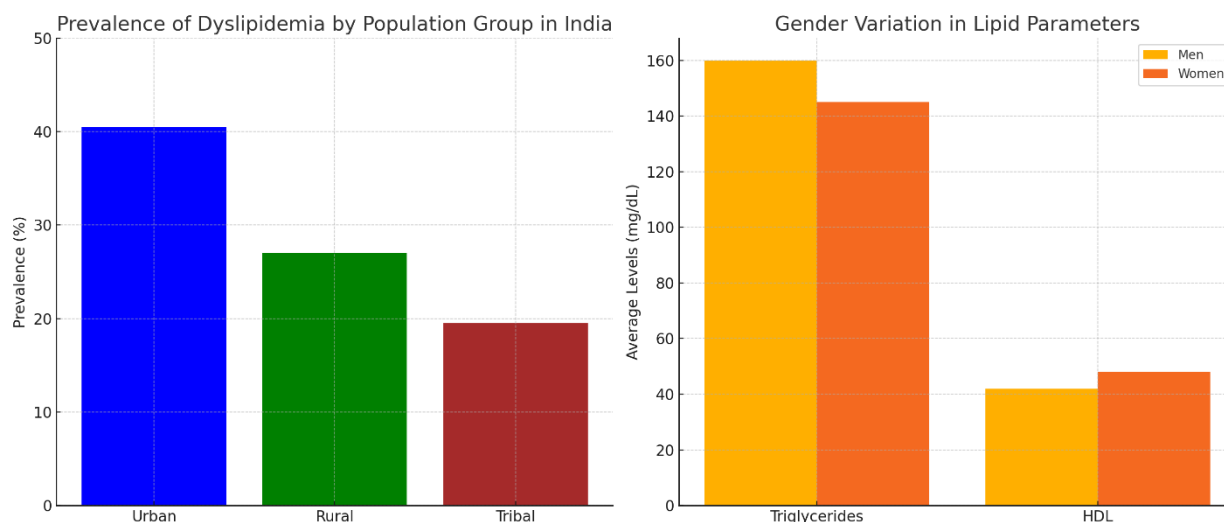
(2) Gender Differences in Lipid Profiles

Parameter	Male (Mean)	Female (Mean)
TC	↑	→
LDL-C	↑	→
HDL-C	↓	↑
TG	↑	↑

(3) Comorbidities and Dyslipidemia

Comorbidity	Dyslipidemia Prevalence (%)
Diabetes	70–75
Hypertension	55–60
Obesity	60–65

These findings underline the growing challenge posed by dyslipidemia in India and highlight the need for region-specific strategies in screening, diagnosis, and management.



DISCUSSION

This review underscores the growing challenge of dyslipidemia in Republic India, driven by a complex interplay of lifestyle transitions, urbanization and rising non-communicable diseases. The markedly higher prevalence in urban populations reflects the dietary shifts towards high-fat, processed foods, reduced physical activity, and higher obesity rates.^[14, 18, 19] The lower prevalence observed in tribal groups is rapidly changing due to acculturation and modernization, necessitating preventive strategies before disease burdens escalate.^[13, 20]

Gender disparities, as seen in most studies, point to important biological and sociocultural influences. For example, hormonal changes in post-menopausal women may contribute to increased triglyceride levels, while lifestyle and occupational stressors in men may predispose them to higher LDL-C levels.^[11,15,16]

The strong correlation between dyslipidemia and other cardiometabolic conditions like diabetes and hypertension emphasizes the need for integrated screening programs. A patient with diabetes is significantly more likely to have lipid abnormalities, indicating a synergistic effect on cardiovascular risk.^[13,16,17] Therefore, national guidelines should recommend routine lipid profiling alongside diabetes screening.

Importantly, this review highlights the silent nature of dyslipidemia—many individuals remain asymptomatic until major cardiovascular events occur. Hence, community-level awareness and preventive screening are essential. Programs like India's NPCDCS (National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke) must strengthen lipid monitoring at the primary care level.^[7]

Several studies also show increasing trends in lipid parameters over time, especially triglycerides and LDL-C in younger populations. This could reflect early onset of risk behaviours such as consumption of junk food, physical inactivity and tobacco use, making early lifestyle interventions in school and college populations, a public health priority.^[19]

The observed variability in dyslipidemia prevalence across India also highlights the influence of socioeconomic status (SES). Urban populations, while having better access to healthcare, often consume diets richer in saturated fats and sugars, increasing lipid abnormalities. Conversely, rural and tribal populations, though traditionally reliant on more natural diets, are now adopting energy-dense processed foods due to market penetration and urban influence. This “nutrition transition” is a key driver of dyslipidemia in lower-income groups.^[6,8]

Another critical dimension is health literacy. Studies noted that awareness about dyslipidemia, its risks and management strategies remains poor across all regions, especially rural and tribal areas. Even when screening is available, the lack of follow-up and sustained care undermines prevention efforts. This calls for the integration of community health workers and mobile health (mHealth) platforms to enhance education and adherence.^[12,17]

In terms of clinical management, statin therapy remains the cornerstone of dyslipidemia treatment in high-risk individuals. However, prescription patterns are inconsistent across India. Some studies reported under-prescription of statins, particularly in rural setups, due to either physician hesitancy or patient non-adherence. Furthermore, newer lipid-lowering agents remain inaccessible to most due to cost, limiting treatment options.^[14,18]

From a policy perspective, India's national programs could benefit from including dyslipidemia-specific modules in primary healthcare settings. Periodic lipid testing should be made affordable or free, particularly for high-risk populations (e.g., diabetics, hypertensives, individuals with family history of CVD). School-based interventions promoting healthy food habits, regular exercise, and early screening for obesity could mitigate long-term lipid disorders.^[7,10]

Public health implications: The growing burden of dyslipidemia demands a multisectoral approach, integrating health, education, agriculture (for food policy) and digital innovation. A national lipid surveillance registry, akin to diabetes and hypertension tracking systems, would be a major step in understanding disease patterns, drug utilization, and outcomes.^[19,20]

Lastly, research innovation is needed to evaluate the role of indigenous dietary patterns, nutraceuticals, and Ayurveda-based interventions in managing lipid disorders. Given India's rich tradition of herbal medicine, scientific validation of these approaches could open new frontiers in integrative dyslipidemia care.^[5,15]

CONCLUSION

Dyslipidaemia in Republic India is widespread, with regional and demographic disparities. Urbanization, gender, tribal lifestyle shifts, and co-morbidities all influence lipid profiles. Prevention strategies must focus on lifestyle modification, early diagnosis, and community-based awareness.

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