NATIONAL WHITE PAPER

OBESITY
— CARE IN —
INDIA

WORLD OBESITY DAY 2025

Foundation for People-centric Health Systems

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Content

Foreword

The alarming rate at which obesity is rising in India necessitates urgent attention. As per the latest National Family Health Survey (NFHS-5, 2019–21), 24% of women and 22.9% of men now grapple with obesity—a near doubling of prevalence since NFHS-3 (2005–06). Equally alarming is the rise among children: 3.4% of under-fives are now obese, a 126% surge from 1.5% in 2005–06. These figures are not mere statistics but a stark warning of a deepening public health emergency. Compounded economic impact of obesity in India in 2019 was $28.9 billion (INR 2.4 lakh crore), equivalent to INR 1,800) per capita and nearly 1.0% of nation's GDP, in healthcare costs and lost productivity. Over weight and obesity is driven by multiple factors such as urbanization, sedentary lifestyles, and changing dietary patterns. The time for action is now; inaction will have grave consequences, placing an increased burden on our health systems and hindering the nation's economic development.

This white paper, "Obesity Care in India", provides a timely and essential analysis of the current situation. Developed in consultation with leading experts in the field, it offers evidence-based recommendations to guide policy and interventions, proposing realistic solutions to this complex challenge.

Recognizing that obesity is not merely a medical problem but one with roots in the diverse social, cultural, and economic dimensions of human life, this paper advocates for solutions that address these multifaceted aspects. It calls for inter-sectoral collaboration, encompassing policy reforms and public awareness campaigns to highlight the harmful effects of obesity and promote effective strategies for mitigating its consequences.

The white paper intends to serves as a vital resource and a call to action for all stakeholders. If the recommendations outlined in this paper are earnestly implemented, with regular monitoring and evaluation, India can become a global leader in effectively addressing the challenge of obesity.

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Foreword

There is an urgency in India. The challenge is of both undernutrition and overnutrition. One of the challenges is of rising Obesity, which is not only a lifestyle problem but a complex, chronic disease that is impacting millions of Indians. We now know the common soil hypothesis and obesity is cause and risk factor for diabetes as well. The dual pandemic of diabesity is going on in India.

Its sudden rise, mainly due to urbanization, sedentary lifestyles, change in dietary patterns, poses significant health challenges and economic burden on the country. Obesity is now widely recognized globally and within the nation as a public health problem and therefore demands urgent, coordinated action. This white paper "Obesity care in India", is a right step at the right time, as it highlights the challenges associated with obesity and a call to action for all stakeholders. It emphasizes the need to reframe obesity as a disease therefore requiring integrated medical care, public health interventions, and policy reforms. This paper presents evidence-based insights from leading experts in public health, nutrition, and clinical care, offering actionable recommendations to address this surging epidemic.

The value of this work is realized in its holistic approach, that addresses not only clinical management of obesity, but its social, economic and cultural aspects. By advocating for policy changes, public awareness campaigns, and the integration of obesity care into primary healthcare systems, this white paper sets the stage for transformative action.

I congratulate the Foundation for People-centric Health Systems (FPHS) for this timely initiative and leadership in bringing this critical issue to the forefront. I am confident that this white paper will serve as a catalyst for meaningful change, paving the way for a healthier, more resilient India.

As a clinician, I attend many patients daily. Obesity is big, economic, financial, emotional and health challenge. It is time to acknowledge obesity as a disease and to treat it with the urgency and empathy it deserves. I urge policymakers, healthcare providers, and communities to join hands in implementing the recommendations put forward in this paper to combat obesity and its far-reaching consequences.

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Former President, Research Society for Study on Diabetes in India

Executive Summary

Why Obesity Care Needs Attention?

- **Rising burden:** Obesity has been recognised as a disease and its burden is rising in all populations and most populations subgroups.
- **Public Health issue:** Obesity is a growing concern in India, reflecting global trends of rising prevalence across all demographics.
- **Health Risk for other conditions:** Obesity increases the risk of type 2 diabetes, cardiovascular diseases, and certain cancers.
- **Unique Genetic Predispositions of India:** The "thin-fat Indian" phenotype heightens susceptibility to complications at lower BMI thresholds.
- **Socioeconomic Impact:** Annual financial burden on the Indian economy estimated at US $28.95 billion in year 2019 due to rising healthcare costs and reduced workforce productivity.

Current Burden and Epidemiology of Obesity in India

- **Rising Prevalence:** Urban prevalence range from 13-50%, rural rates between 08-38%.
- **Affected Demographics:** Higher prevalence among women, urban residents, and individuals from higher socioeconomic strata.
- **Contributing Factors:** Rapid urbanization, lifestyle transitions air pollution
- **Healthcare Gaps:** Early diagnosis and treatment are hindered by insufficient healthcare integration and limited awareness.

Existing Challenges

- **Systemic Hurdles:** Multiple healthcare priorities overshadow obesity care, leaving it under-resourced.
- **Cultural Barriers:** Stigma and blurred perceptions of obesity prevent early intervention.
- **Inadequate Protocols:** Lack of standardized obesity care guidelines and insufficient healthcare professional training.

Prevention of Obesity Through Public Health Interventions

- **Key National Programs:** Ayushman Bharat Program, Fit India Movement, Eat Right India, and Rashtriya Kishor Swasthya Karyakram (RKSK) have towns on welleness.
- **Focus Areas:** Urban planning, school-based programs, and leveraging digital tools for awareness and behavioural change.
- **Community Engagement:** Encouraging healthy lifestyle habits through targeted interventions and policy measures.

Economic Burden

- **Healthcare Costs:** Obesity contributes significantly to escalating healthcare expenses.
- **Impact on Workforce Productivity:** Reduced efficiency and increased absenteeism due to obesity-related health conditions.
- **Potential Escalation:** Without effective interventions, the economic burden is .... to increase further.

Treatment Options: Available and Emerging

- **Anti-obesity Medicine in India:** Until recently, pharmacological options for obesity management in India were limited. However, the availability of **GLP-1 receptor agonists,** such as **Semaglutide,** and the introduction of newer therapies, including **dual GLP-1 & GIP receptor agonists** like **Tirzepatide,** which has received market authorization as an anti-obesity medication, have significantly expanded the treatment landscape.

Emerging Therapies:

- Development of triple agonists targeting GLP-1 and GIP receptors is in progress.
- Hormone-regulating treatments targeting leptin and ghrelin.

- **Bariatric Surgery:** Growing adoption but limited to a fraction of the population due to high costs and limited health insurance coverage.

What Stakeholder Can Do

- **Government:** Develop robust obesity-specific policy frameworks and integrate care into primary healthcare services.
- **Healthcare Providers:** Train professionals to deliver standardized obesity care and promote capacity-building programs.
- **Community Organizations:** Enhance public awareness campaigns and advocate for healthier lifestyle choices.
- **Private Sector:** Collaborate on creating affordable therapeutic and technological solutions for obesity care.

The Way Forward

- **Simplification of obesity care protocol:** A simplified obesity care protocol which should be used to train primary care physicians in identification of obesity and referral to speciality providers.
- **Need to raise awareness in general public about rising burden and impact of obesity**
- **Primary Healthcare Integration:** Incorporate obesity management into primary care services with a focus on preventive measures.
- **New Therapies:** Expedite the approval and availability of emerging treatments.
- **Public Awareness:** Launch culturally sensitive campaigns to reduce stigma and encourage healthier behaviours.
- **SMART Goals:** Use evidence-based treatment objectives to achieve sustainable outcomes.
- **Intersectoral Collaboration:** Foster partnerships between government, private sector, and NGOs for comprehensive obesity management.
- **Technology Utilization:** Leverage digital tools for monitoring, education, and interventions.
- **Policy Frameworks:** Develop evidence-based policies informed by global best practices while addressing India's unique needs.

Graphical Overview

Epidemiology of Obesity in India

- **Growing Prevalence:** Obesity rates in urban areas range from 13% to 50%, and in rural areas from 08% to 38%. [1]
- **Higher Rates in Women:** Women are more likely to be obese than men due to cultural and lifestyle factors. [1]
- **Regional Differences:** Northern, western, southern, and northeastern states have higher obesity rates compared to central and eastern regions.[1]
- **Rising Childhood Obesity:** The number of overweight children increased from 2.1% to 3.4% between recent national surveys (NFHS-4 to NFHS-5). [2]
- **Increasing Adult Obesity:** Among adults aged 18–69, male obesity rose from 18.9% to 22.9%, and female obesity from 20.6% to 24% over the same period. [2]
- **Unique Body Type Risk:** The "thin-fat Indian" body type means even people with normal BMI may have high body fat and related health risks. [3]
- **Sarcopenic Obesity in Older Adults:** Many older adults experience obesity combined with muscle loss, leading to serious health issues. [1]
- **Economic Costs:** Obesity costs India $23.2 billion annually due to healthcare expenses and lost productivity. [4]
- **Global Impact:** India ranks third globally for projected obesity-related economic losses, after China and the United States. [4]
- **Key Contributors:** Urbanization, unhealthy diets, sedentary habits, and reduced physical activity are driving obesity rates higher. [1]

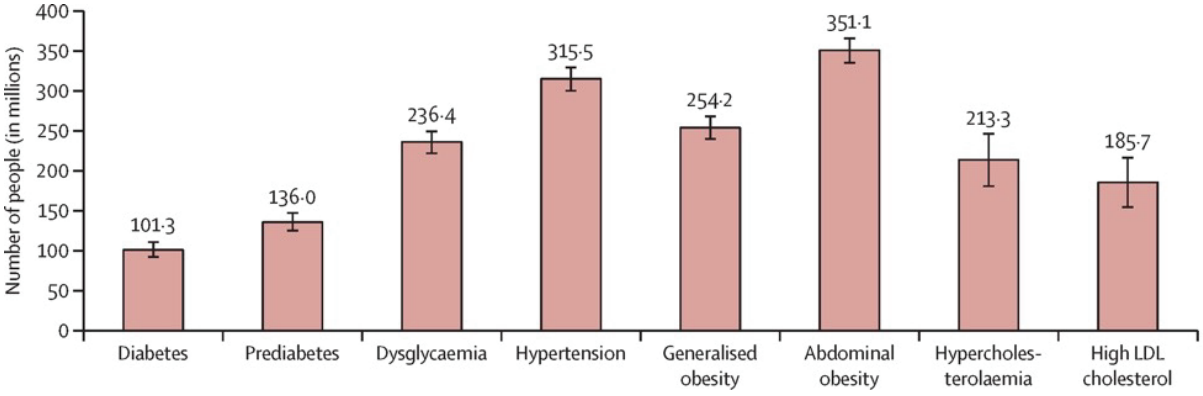


Figure 1. Burden of metabolic conditions in India

Source: *Anjana RM, 2023*

Figure 1 highlights the burden of generalised and abdominal obesity amongst adult population in India, viz a viz other metabolic conditions.

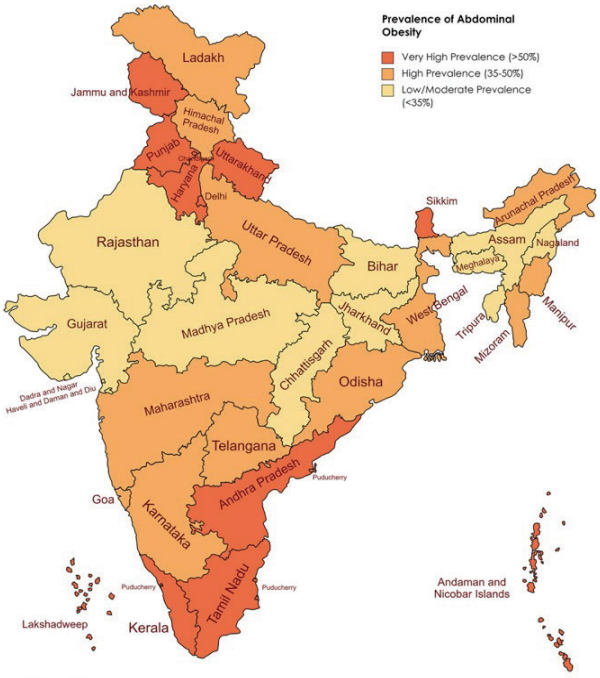


Figure 2. Prevalence of abdominal obesity (waist circumference more than 80 cm) in women of age 15–49 years in Indian states. (NFHS-5)

Source: *Chaudhary & Sharma, 2023)*

Figure 2 is a map of India illustrating the prevalence of abdominal obesity, categorized into three levels: low/moderate prevalence (<35%) in light yellow, high prevalence (35–50%) in orange, and very high prevalence (>50%) in red. The majority of states, including Rajasthan, Gujarat, Madhya Pradesh, and most northeastern states, are shaded in yellow, reflecting low to moderate prevalence. The map visually highlights the regional disparities in abdominal obesity across India, with southern and some northern regions experiencing higher rates. [2]

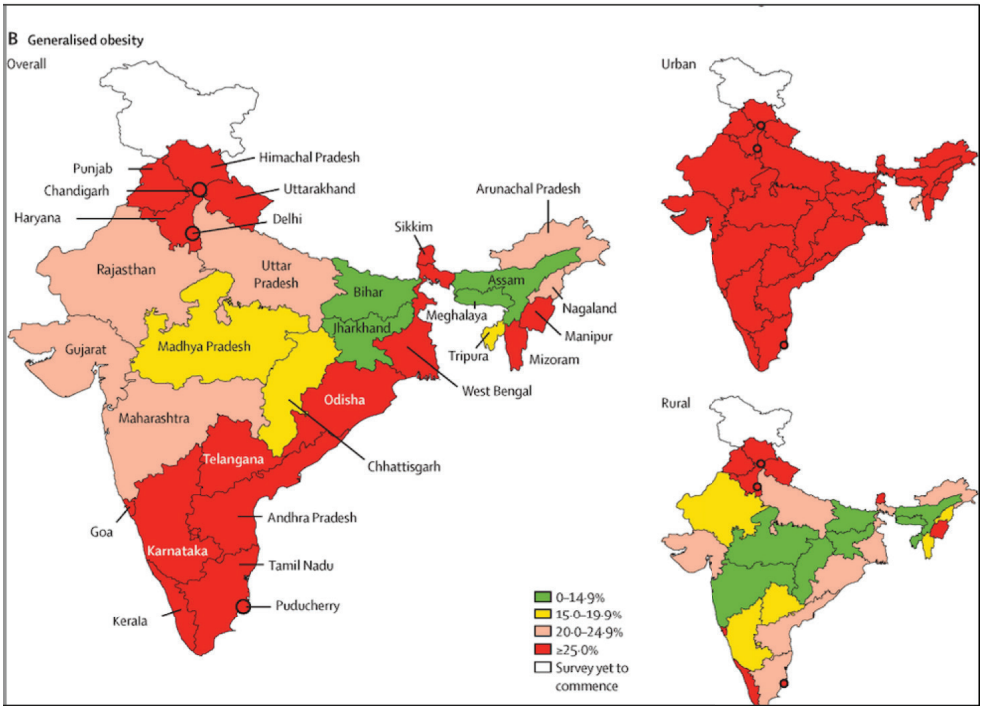


Figure 3. Burden of generalised obesity in Indian states

Source: *Anjana RM et al, 2023*

Figure 3 illustrates the challenge of generalised obesity in Indian states. The North India and southern Indian states have highest prevalence of obesity [5]. Most urban areas across the country have relatively higher prevalence but the prevalence in rural areas is also rising.

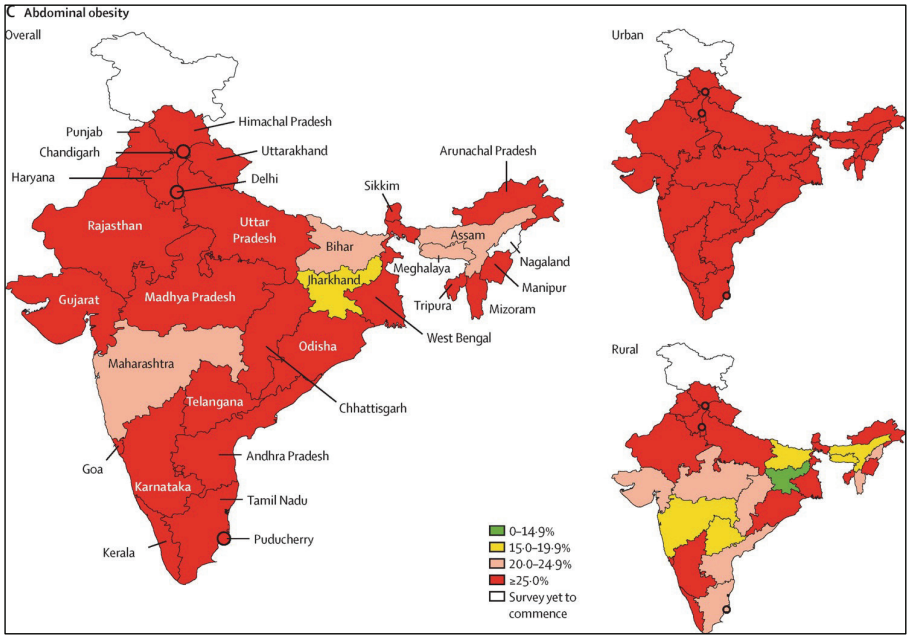


Figure 4. Burden of abdominal obesity in Indian states
Source: *Anjana RM et al, 2023*

The prevalence of abdominal obesity is even higher (than generalised obesity) across Indian states barring a few. This is an area where the rural areas in many states are competing with urban areas as far as obesity is concerned. The figures and graphs above clearly indicate the current situation in obesity in Indian states and status of things to come.

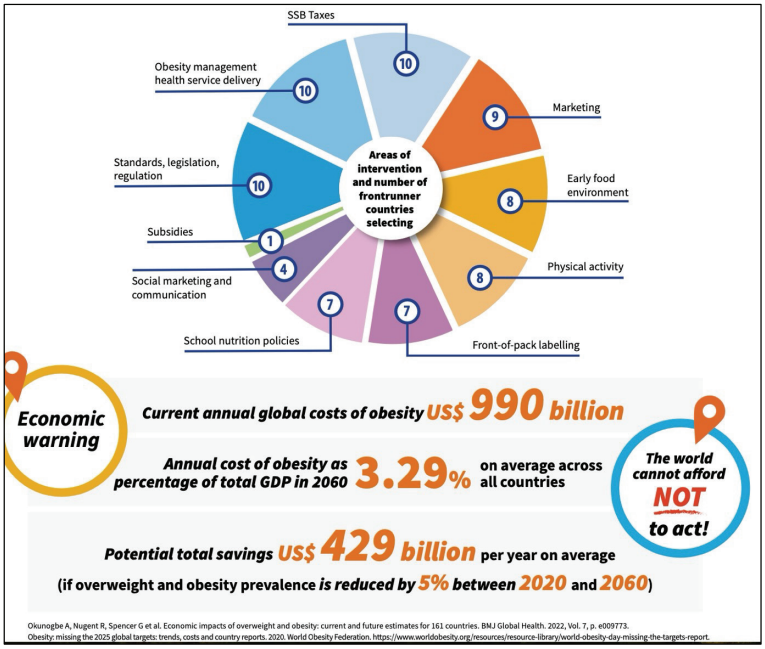


Figure 5. Obesity Interventions prioritized by countries
Source: *Okunogbe A, et al, 2022*

Figure 5 showcases a diagram detailing various obesity interventions prioritized by frontrunner countries. Central to the graphic is a circular layout, indicating different strategies such as SSB (sugar-sweetened beverage) taxes, marketing, and school nutrition policies, along with the number of countries implementing each intervention. The areas of intervention are color-coded, with "Obesity management health service delivery" and "Standards, legislation, regulation" receiving the highest priority, each endorsed by ten countries. The infographic also emphasizes the significant economic impact of obesity, stating that the current annual global costs amount to $990 billion and could represent 3.29% of total GDP by 2060. Furthermore, it highlights a potential savings of $429 billion per year if obesity prevalence is reduced by just 5% between 2020 and 2060, underscoring the urgency of action in combating obesity. [6] It is this recognition of challenge of rising obesity that globally, the need for simplified definition and approach to obesity management is being recommended.

Figure 6 below highlights the recent approaches to preclinical and clinical obesity classifications, proposed at global level.

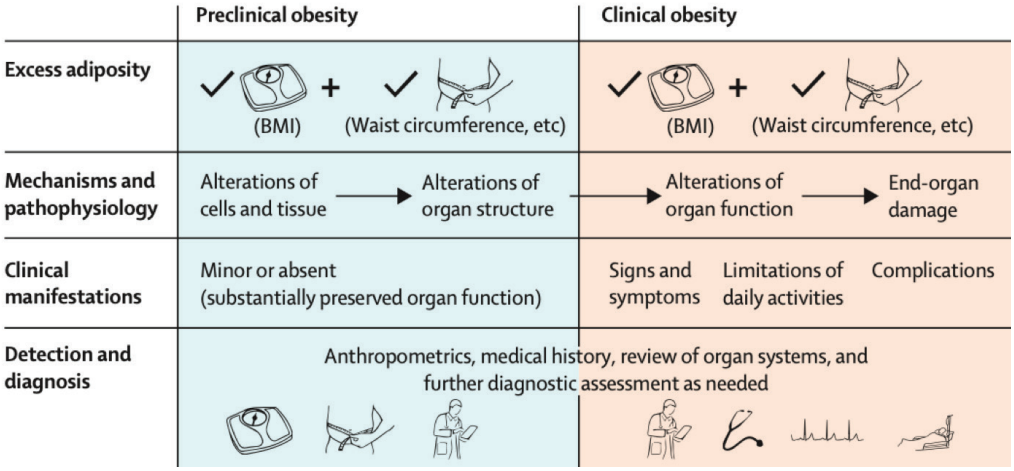


Figure 6. Preclinical and clinical obesity
Source: *Lancet Commission on Obesity, 2025*

Section 1:

Obesity: A Disease, Not Just a Risk Factor

Burden and epidemiology of obesity in India

Modern medical consensus recognizes obesity not merely as a risk factor for other health conditions but as a chronic, multifaceted disease in its own right. Characterized by excessive and abnormal fat accumulation, obesity alters metabolic pathways and exacerbates systemic inflammation, which drives numerous comorbidities. This classification underscores the necessity of addressing obesity with the same seriousness as other chronic diseases, requiring comprehensive prevention, management, and policy strategies tailored to the needs of affected populations.

Overweight, or obesity, is a chronic condition that arises from a combination of social and environmental factors and a person's inherited propensity to gain weight. When excessive fat accumulation reaches a level that poses a risk to an individual's health, it results in overweight or obesity. [26]. "Abnormal or excessive fat accumulation that presents a risk to health" is how the World Health Organization defines overweight and obesity. It is a persistent, chronic, relapsing illness characterized by excessive body fat that can harm one's health [27]. The definition of obesity according to different international organizations is displayed in Table 1 [9-19]. Obesity is define as "a chronic multifactorial and multidimensional syndrome characterized by an inappropriate percentage or distribution of adipose tissue associated with multisystemic comorbidities and complications, which require long-term mitigation and management" after taking all of these factors into account.

Globally, obesity rates have tripled since 1975, and experts now classify it as a pandemic [7]. According to a WHO report, about one-third of the global adult population is overweight, and nearly one in ten is obese [27]. Lower-income countries have experienced the steepest rise in obesity rates over the past decade, while no country has reported a decrease in overall obesity levels. Furthermore, none are on track to meet the WHO's target of maintaining 2010 obesity levels by 2025. Estimates suggest that by 2035, more than 4 billion people worldwide will be classified as overweight or obese (BMI $\geq 25\,kg/m^2$), a significant increase from 2.6 billion in 2020. This rise translates to over 50% of the global population being affected by 2035, compared to 38% in 2020. Specifically, obesity (BMI $\geq 30\,kg/m^2$) is projected to affect nearly 24% of the population, or around 2 billion individuals, by 2035, compared to 14% in 2020 [28].

In the Asia-Pacific region, approximately 1 billion adults live with overweight or obesity and a similar situation is expected in India, with nearly 11% of the population expected to live with obesity by 2035.[29] In

India, obesity is rising sharply, similar to trends in other countries. According to World Obesity reports, the prevalence of obesity (BMI ≥ 24 kg/m²) in India is about 11%, which is higher than in many other low-middle-income countries and comparable to rates in high-middle-income countries. According to the National Family Health Survey-5 (NFHS-5) the prevalence of overweight and obesity (BMI ≥ 22.9 kg/m²) was 44.02% among men and 41.16% among women. This marks a relative increase of 6.37% in men and 5.10% in women compared to NFHS-4 findings (37.71% and 36.14%, respectively) [30].

The data also revealed sociodemographic disparities, with obesity rates being higher in northern, western, southern, and most northeastern states, while central and eastern states reported lower prevalence. An urban-rural divide in obesity a prevalence was also evident [31, 32]. About 13% to 50% of the urban population and 8% to 38.2% of the rural population are affected. [33] Obesity is more commonly seen in women compared to men and is increasing in children and adolescents.[33] The main contributors to this rise are adoption of sedentary lifestyle and consumption of energy dense foods.

Obesity in Childhood:

The World Obesity Federation reports that India's annual increase in childhood obesity is the steepest in the world, second only to Vietnam and Namibia, and estimates indicate that the country's adult obesity rate has more than tripled, according to the Economic Survey Report. According to data from the National Family Health Survey (NFHS-5), the prevalence of obesity among males aged 18–69 increased from 18.9% in NFHS-4 (2015–16) to 22.9% in NFHS-5. Among women, the proportion rose from 20.6% to 24%. The trend is also concerning for children, as the percentage of overweight children increased from 2.1% in NFHS-4 to 3.4% in NFHS-5. [30]

The Longitudinal Ageing Study in India (LASI), conducted in 2017-18 among over 73,000 adults aged 45 years and older, reported an overall overweight prevalence (BMI > 22.9 kg/m²) of 14.02% and obesity prevalence of 27.1%. LASI findings showed that older women were more likely to be obese (32%) compared to older men (21.4%), differing from NFHS results [26]. Similarly, the ICMR-INDIAB study among adults aged 20 years and older estimated a 28.6% prevalence of generalized obesity (BMI ≥ 25 kg/m²) and 39.5% prevalence of abdominal obesity (waist circumference ≥90 cm for men and ≥80 cm for women) [34]. These findings align with trends observed in national surveys.

While most obesity estimates focus on adults, national-level data for children and adolescents remain limited. This is concerning because global obesity rates are projected to increase most rapidly among these groups, rising from 10% to 20% in boys and from 8% to 18% in girls between 2020 and 2035 [28]. To address this gap, the Comprehensive National Nutrition Survey (CNNS) 2018-19 was conducted in India, offering a detailed analysis of the nutritional status of pre-schoolers (0–4 years), school-aged children (5–9 years), and teenagers (10–19 years), with a total sample size of 112,245 participants. A secondary analysis involving 65,562 individuals with biochemical data reported the prevalence of overweight and obesity as 2.69%, 4.18%, and 4.99% in these groups, respectively [35]. Additionally, studies have shown that Asian Indian children, even those with normal weight, are at risk for cardiometabolic issues, with these risks being significantly higher in overweight children [32].

Variations in Obesity

Asian Indian obesity differs from that of white Caucasians as Asian Indians have more total, truncal, intra-abdominal, and subcutaneous adipose tissue.[33,35] The metabolic syndrome is intimately linked to fat accumulation in ectopic tissues such as the liver, pancreas, dorso-cervical region (also known as the "buffalo hump"), and beneath the chin (also known as the "double chin").[36]

A notable characteristic of the South Asian population is the "normal weight obesity"

Sort out our children to sort out the epidemic of obesity.

- *Dr. Vivek Bindal*

phenotype, where individuals have high body fat despite a normal BMI [30]. For instance, a study conducted in Kerala revealed that about one-third of the population exhibited this condition [37]. Another variation is sarcopenic obesity, which involves both obesity and sarcopenia. Diagnosing sarcopenic obesity requires measuring BMI or waist circumference with ethnicity-specific thresholds and assessing muscle mass and strength. Sarcopenia refers to the age-related loss of skeletal muscle mass and strength, which can start as early as the fourth decade of life. Studies suggest that skeletal muscle mass decreases progressively, with individuals losing up to 50% of their muscle mass by the age of 80 [38].

Sociodemographic and Ethnic Influences on Obesity in India

Recent studies highlight a rapid rise in overweight and obesity rates among adults in India, largely driven by changes in sociodemographic factors such as lifestyle shifts, work culture transitions, substance use, reduced physical activity, and unhealthy eating habits. Key contributors to this trend include age, urban residency, higher wealth index, access to clean fuel and sanitation facilities, and poor dietary patterns [39].

Ethnicity and socioeconomic status significantly influence Body Mass Index (BMI) in both men and women. Individuals with mixed ancestry from high-risk groups tend to exhibit intermediate obesity risks, while certain ethnic groups are more predisposed to obesity-related health complications. For example, Indian males have a higher likelihood of being overweight compared to White British males. A study examining the relationship between ethnicity and obesity across Indian regions found that body fat deposition was highest among both males and females from Delhi. [40].

Research by Luke et al. identified environmental factors as key drivers of ethnic differences in obesity [41]. Kapoor et al. further highlighted variations among South Indians, North Indians, and Northeast Indians, noting differences in obesity's impact on cardio-respiratory health [40]. These disparities in adiposity and intermediate traits in mixed-ethnicity individuals are likely influenced by both genetic and environmental factors [42]. Additionally, differences in energy intake, physical activity, and body composition—such as fat vs. muscle and abdominal visceral vs. subcutaneous fat—vary among ethnic groups due to genetic predispositions [43]. The 2014 INDIA-ICMR study reported high levels of physical inactivity in India, with a prevalence of 54.5%. Urban areas had higher inactivity rates (60%) compared to rural areas (50%), with women being less active than men [44].

The primary objective of this white paper is to present an in-depth analysis of the current state of obesity care in India, including prevention, management, and policy measures. By highlighting successful interventions, identifying gaps, and drawing lessons from international best practices, this review aims to offer actionable strategies for addressing the obesity epidemic. Furthermore, it seeks to outline a vision for the future, emphasizing innovations in care delivery, community engagement, and policymaking to combat this growing public health challenge.

Section 2:

Approach Adopted to Develop this White Paper

This policy review on obesity care in India was conducted to analyse existing frameworks, identify gaps, and propose actionable recommendations. The study utilized a systematic review methodology, including both primary and secondary data sources. Policies and programs were identified through a comprehensive search of government publications, peer-reviewed journals, and reports from global and national health organizations such as the WHO and the Ministry of Health and Family Welfare (India). A Comprehensive literature review of articles available on PubMed was also conducted to analyse existing data.

Key stakeholders, including healthcare providers, policymakers, and public health experts, were consulted to understand the ground realities of obesity management. A number of subject experts were interviewed & their opinion & inputs were ues & incorporated. The framework for analysis included evaluating policies on prevention, treatment, awareness, and infrastructural support for obesity care, with a focus on alignment to global best practices. A SWOT analysis was conducted to identify inconsistencies in implementation and barriers at different levels. Recommendations were formulated based on findings, with an emphasis on scalability, feasibility, and cultural adaptability to the Indian context.

A situational analysis was done with specific objective to assess the current burden of obesity and the methods used for its evaluation in India, identify treatment gaps, explore emerging treatment options for obesity and their relevance to the Indian context, establish effective management strategies, and develop a practical treatment algorithm for obesity management.

Section 3:

Why Obesity Care need Urgent Attention?

Obesity presents a significant public health challenge and requires immediate and focused action. The following data points and trends from the WHO document emphasize the urgency:

- **Epidemic Proportions:** Obesity has reached epidemic levels globally, with projections indicating that over one billion adults will be classified as obese by 2030. [7]
- **Global Prevalence:** Previously associated primarily with high-income countries, obesity is increasingly becoming a concern in low- and middle-income countries, affecting lower socio-economic groups disproportionately. [7]
- **Health Risks:** Individuals with obesity face a significantly higher risk for chronic diseases, including diabetes, cardiovascular diseases, and certain types of cancer, which collectively place a heavy burden on healthcare systems. [7]
- **Inequalities:** The obesity pandemic amplifies social and economic inequalities, disproportionately impacting marginalized communities and contributing to a cycle of poor health outcomes.
- **Global Nutrition Targets:** Addressing obesity is pivotal for meeting the 2025 Global Nutrition Targets and is crucial for achieving Sustainable Development Goal (SDG) target 3.4, which aims to reduce premature mortality from noncommunicable diseases by one third by 2030.[8]

Table 1: Definition of obesity by different organizations and communities worldwide. (9-19)

Society	Definition
The Scottish Intercollegiate Guideline [9]	Obesity is defined as a disease process characterized by excessive body fat accumulation with multiple organ-specific consequences
The World Obesity Federation [10]	Obesity is a chronic relapsing disease process, defined by excessive adiposity that may impair health
American Medical Association [11]	Obesity is a disease state with multiple pathophysiological aspects requiring a range of interventions to advance obesity treatment and prevention

Society	Definition
American Association of Clinical Endocrinologists and the American College of Endocrinology [12]	Obesity is a complex, adiposity-based chronic disease (ABCD), where management targets both weight-related complications and adiposity to improve overall health and quality of life
Obesity Canada [13]	Obesity is a chronic and progressive disease similar to diabetes or high blood pressure
American Society for Metabolic and Bariatric Surgery [14]	Obesity is a chronic progressive disease resulting from multiple environmental and genetic factors
American Heart Association [15]	Obesity is a multifactorial disease with a complex pathogenesis related to biological, psychosocial, socioeconomic, and environmental factors and heterogeneity in the pathways and mechanisms by which it leads to adverse health outcomes
European Association for the Study of Obesity [16]	Obesity is an adiposity-based chronic disease. ABCD incorporates the characteristics of adiposity, including the total amount, distribution, and function of adipose tissue.
Royal College of Physicians [17]	Obesity is not a lifestyle choice caused by individual greed but a disease caused by health inequalities, genetic influences, and social factors
The Singapore Ministry of Health [18]	Obesity is a condition of excessive body fat with adverse effects on health and is an increasing global problem that contributes to chronic disease burden and healthcare costs
Malaysian Association for the Study of Obesity and Malaysian Diabetes Association [19]	Obesity is a complex, multifactorial condition characterized by excess body fat. It must be viewed as a chronic disorder that essentially requires perpetual care, support, and follow-up.
Endocrine Society of India [20]	Obesity is a chronic, relapsing progressive disease defined by excessive adiposity that may impair health. The management of obesity should follow the approach that is followed for any chronic disease, i.e., initiate interventions and keep titrating these with time in order to achieve our treatment goals.

Key Points on the Public Health Challenge of Obesity

- **Rising Global Challenge:** Obesity is a significant global health issue, with 650 million obese and 1.9 billion overweight adults globally as of 2016, according to WHO estimates. [21]
- **Tripling Prevalence:** The prevalence of obesity has nearly tripled worldwide between 1975 and 2016, affecting both high-income and low- to middle-income countries. [22]
- **India's Growing Burden:** India is witnessing a sharp rise in obesity across all age groups, driven by urbanization, dietary transitions, sedentary lifestyles, and genetic factors like the "thin-fat Indian" phenotype. [3]
- **Chronic Disease Link:** Obesity is a key contributor to non-communicable diseases (NCDs) such as diabetes, cardiovascular diseases, and certain cancers. [23]
- **Economic Impact:** Obesity imposes a substantial economic burden, increasing healthcare costs and reducing workforce productivity. [21]
- **Mental and Social Impacts:** Beyond physical health, obesity affects mental well-being and exacerbates social stigma, making it a multifaceted public health concern. [23]
- **Urgent Need for Action:** Obesity should be

recognized and treated as a chronic illness, requiring immediate interventions in screening, treatment, and prevention strategies.

- **Effective Weight-Loss Programs:** Targeted interventions for high-risk groups can reduce both medical costs and the financial burden on health systems.
- **Holistic Approach in India:** Endocrinology experts emphasize the need for comprehensive obesity management strategies, including epidemiological understanding, clinical implications, and affordable treatment options.
- **Policy Recommendations:** Advocates for the integration of obesity care into public health systems, promoting affordable weight-loss strategies and accessible prescription drugs.

Risk factors for obesity:

Obesity is influenced by multiple factors, including changes in diet, physical activity, and genetics. Dietary transitions have played a significant role, as traditional, nutrient-rich foods are increasingly replaced with processed and calorie-dense options. Sedentary lifestyles, characterized by long hours of sitting and minimal physical activity, have become more common with advancements in technology and desk-based jobs. Urbanization has further contributed by reducing opportunities for physical activity, such as walking or cycling, due to limited open spaces and increased reliance on vehicles. Additionally, genetic predispositions like the "thin-fat Indian" phenotype make some individuals more prone to accumulating body fat despite having a normal body weight, increasing their risk of obesity-related health issues.

Urbanization has significantly increased the risk of obesity by encouraging sedentary lifestyles and reducing physical activity. City life often involves long commutes, desk jobs, and limited access to recreational spaces, leaving little room for exercise or active living. Moreover, urban areas are dominated by fast food outlets and processed food options, leading to unhealthy eating habits. The convenience of modern technology, from online shopping to digital entertainment, further reduces physical activity. Combined, these factors create an environment that promotes weight gain, making urbanization and sedentary behaviours major contributors to the rising prevalence of obesity.

Impact of Obesity

The increase in obesity has led to increase in associated co-morbidities like Type2 Diabetes mellitus (T2DM), hypertension, dyslipidemia, coronary heart disease (CHD), Metabolic Dysfunction-associated Steatotic Liver Disease (MASLD), obstructive sleep apnoea and certain cancers. Being overweight and obese are two of the most common lifestyle disorders that create extra health issues and contribute to a variety of chronic diseases such as T2DM, cancer, cardiovascular disease (CVDs), and metabolic syndrome (MetS) [7]. The occurrence of multiple morbidities causes financial burden on the individual and the health care resources. Direct and indirect effects of obesity account for 10% of healthcare costs. Taking steps to prevent, manage, and treat obesity is expensive. Obese people spend 32% more on medical costs than people of normal weight. Beyond direct medical expenses, obesity incurs significant indirect costs, such as expenses related to accessing healthcare, economic losses from premature deaths, absenteeism, and reduced work productivity. Direct costs account for 32% of total obesity-related expenses, while indirect costs make up 68% [25]. Obesity has a large number of short- and long-term complications, as well as a potential economic impact [14]. Hence, it is important for physicians in India to diagnose and initiate early treatment to halt the progressive increase in body weight and development of co-morbidities.

Obesity is on the rise globally, with roughly 20% of ICU patients suffering from it [1]. Adipose tissue is metabolically active, and visceral adipose tissue, in particular, has a negative adipocyte secretory profile, leading to IR, persistent low-grade inflammation, T2DM, hypertension (HTN), CVDs, dyslipidemia, obstructive sleep apnoea, chronic

Obesity is not just a health issue; it's a national economic and social challenge.

- *Dr. Purushottam Giri*

kidney disease (CKD), Metabolic dysfunction-associated steatotic liver disease (MASLD) and hypoventilation syndrome, physical impairments [7].

Overweight and obesity are responsible for over 3.4 million deaths annually, contributing to 4% of years of life lost and at least 4% of global disability-adjusted life years (DALYs) [24]. The prevalence of obesity in India is projected to rise to 57% of the population. The growing prevalence of obesity is expected to have a substantial impact across various settings, with significant economic consequences. The annual cost of overweight and obesity to the Indian economy is estimated at $23.2 billion, equating to 1.7% of the country's GDP. This estimate, based on sensitivity analysis, considers the value of life expectancy gains from preventing premature deaths. Without effective public health interventions, including screening, treatment, and awareness initiatives, the economic burden could rise to nearly $440 billion by 2060, representing a 19-fold increase. India ranks third globally in projected obesity-related economic burdens, following China and the United States [6].

A report from the World Obesity Federation in 2017 projected that India will spend $13 million annually on treating obesity-related diseases by 2025 while another study estimates the obesity costs to range between 0.8% and 2.42% of GDP in eight countries, including India, Australia, Brazil, and South Africa. These figures underline obesity's economic toll as a major obstacle to development [6]. As highlighted in Yoong's review, societal cost savings from addressing obesity are likely to be much greater than currently estimated [21].

Section 4:

Prevention of Obesity Through Public Health Interventions

Existing Programs Targeting Obesity in India

1. **Rashtriya Kishor Swasthya Karyakram (RKSK), 2014 [45]**

- Focuses on holistic adolescent health, with nutrition as a priority area.
- Implements Social and Behaviour Change Communication (SBCC) strategies through schools, families, and communities.
- Provides facility-based counselling and adolescent-friendly health clinics to promote healthy growth and prevent obesity.

2. **Eat Right India, 2018 [46]**

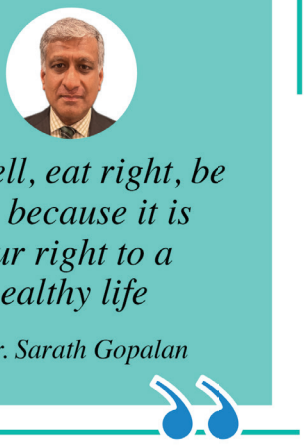
- Promotes safe, healthy, and sustainable eating practices.
- Encourages balanced diets and reduces processed/high-fat food consumption.
- Integrates public education campaigns and collaborative efforts for behavioral shifts.
- Provides nutrition education and promotes physical activity among school-aged children.
- Encourages early adoption of healthy habits to address childhood obesity.

3. **Ayushman Bharat Program, 2018 [47]**

- Focuses on preventive health through Health and Wellness Centres (HWCs).
- Promotes balanced diets, regular exercise, yoga, and behavioural change for obesity prevention.

4. **Fit India Movement, 2019 [48]**

- Promotes daily physical activity through the Fit India Mobile App and Youth Clubs.



Uses SBCC strategies to build sustainable fitness habits and combat sedentary lifestyles.

5. **National Programme for Prevention and Control of Non-Communicable Diseases (NP-NCD), 2023-2030 [50]**

- Emphasizes health promotion, early diagnosis, and weight management.
- Incorporates exercise and lifestyle modifications to prevent obesity and related NCDs.

Service Delivery Insights

- **Perception of Obesity:**
  - The perception of obesity in India remains blurred. Many individuals, including healthcare professionals, do not recognize obesity as a disease but rather as a lifestyle choice.
  - Social stigma and misconceptions often prevent individuals from seeking medical care for obesity.
- **Awareness and Demand for Care:**
  - Limited public awareness about the risks associated with obesity reduces the demand for targeted care.
  - Cultural norms, such as viewing higher body weight as a sign of prosperity, further hinder recognition of obesity as a health issue.

Key Gaps

- Absence of well-defined, standalone obesity care programs in public health.
- Poor integration of obesity prevention into existing maternal, child, and adolescent health initiatives.
- Limited funding and infrastructural support for comprehensive obesity management, including counselling and follow-up.

By addressing these challenges and leveraging existing programs, India can take a more structured and evidence-based approach to prevent and manage obesity at a public health level.

Obesity prevention initiatives have benefited from earlier studies conducted by the country's scientists that shed light on several facets of the obesity issue. For instance, there is a widespread agreement that people's living conditions and the places they visit ought to change [37-40]. The facts that there are no easy or one-dimensional answers has been another significant discovery. Previous research has aided scientists and medical professionals in comprehending the necessity of a "meta-strategy" for preventing obesity that encompasses a variety of suggestions. While any one possible approach can help prevent obesity, it is insufficient to address this intricate issue on its own.

The Figure 7 illustrates a conceptual framework that highlights the interconnected environments crucial for effectively addressing obesity prevention. It identifies five key areas: Message, School, Food and Beverage, Physical Activity, and Health Care and Work environments. The overlaps among these areas signify their collaborative roles in influencing individual and community health outcomes related to obesity. At the top of the framework, the emphasis on Engagement, Leadership, and Action underscores the vital involvement of individuals, families, communities, and society in driving change. Furthermore, the framework advocates for a continuous assessment of progress in obesity prevention efforts,

The private sector is essential in tackling obesity, and innovative solutions are needed. Policy reforms can make a significant difference in public health outcomes. It can really make a difference

- Ms. Preetu Mishra

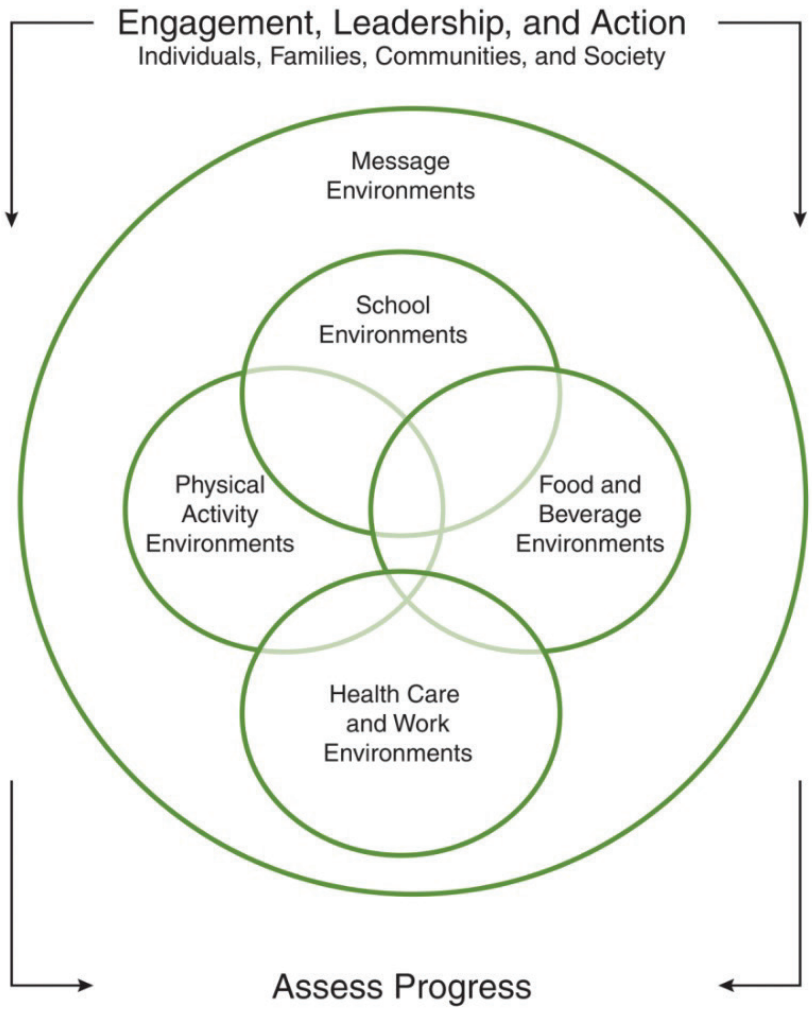


Figure 7: Interconnections of areas of focus on accelerating progress in obesity prevention

reinforcing the necessity for coordinated initiatives that foster healthier environments and promote sustainable lifestyle changes. By recognizing these interconnections, stakeholders can better direct their strategies to accelerate meaningful progress in combatting obesity. [51]

Section 5:

Challenges in Obesity Care in India

The delivery of obesity care in India faces multiple challenges, including low treatment priority, limited public awareness, and a fragmented healthcare system. Service delivery refers to how obesity is integrated into healthcare systems and the extent to which it receives attention from policymakers, healthcare providers, and the public. Despite obesity being a growing public health crisis, it often does not receive the same level of attention as other non-communicable diseases (NCDs) such as diabetes or cardiovascular diseases.

Studies indicate that obesity is not consistently prioritized in healthcare services [4,52,53]. Many patients and even healthcare providers fail to recognize obesity as a disease requiring intervention. This perception is further complicated by a blurred definition of obesity, where societal norms often associate being overweight with affluence or good health, leading to under-recognition of the associated risks. Additionally, the absence of standardized diagnostic and treatment protocols for obesity further limits its prioritization in healthcare systems.

Public Awareness and Attitudes: At the public level, the perception of obesity as a health concern remains limited. Unlike communicable diseases, obesity lacks the urgency associated with visible, acute illnesses, and its treatment is often viewed as optional or secondary. Many individuals do not perceive the need for obesity treatment until they develop complications such as diabetes or hypertension. The lack of awareness about the long-term health risks of obesity, including its role in metabolic syndrome and other NCDs, contributes to delayed care-seeking behaviour.

Systemic Challenges in Service Delivery: Public healthcare facilities in India are often overwhelmed with acute and infectious disease burdens, leaving limited resources and infrastructure for preventive and lifestyle-focused interventions like obesity care [7]. Obesity management necessitates a multidisciplinary approach, incorporating nutrition counselling, behavioural therapy, and, in some cases, pharmacological or surgical interventions. However, it is rarely integrated into routine healthcare services in India. The current state of obesity care reflects systemic and cultural challenges that limit its prioritization and effective management. Addressing these gaps requires public health campaigns to enhance awareness, standardized definitions and protocols for diagnosing and managing obesity, and better integration of obesity care into existing healthcare system.

The Need for Multisectoral Action on Obesity: Unrecognized Challenges

Obesity is a growing global public health issue with significant physical, mental, social, and economic ramifications. Despite its prevalence and impacts, obesity is often not recognized as a pressing challenge requiring a multisectoral approach. Below is a detailed discussion on this issue:

1. Lack of Recognition as a Public Health Priority

- **Limited Awareness Among Stakeholders:** Obesity is often perceived as a personal responsibility issue rather than a societal problem. This narrow view downplays the need for systemic action.
- **Blurred Definition and Perception:** In many countries, including India, cultural perceptions of "healthy weight" vary, and obesity is not universally recognized as a chronic disease [7]. This lack of clarity hampers prioritization in public health agendas.
- **Competing Health Priorities:** Public health systems in LMICs are overwhelmed by infectious diseases and maternal-child health issues. As a result, NCDs like obesity receive insufficient attention [54].

2. Complexity of the Issue Requires Multisectoral Coordination

- **Diverse Causes:** Obesity stems from a combination of factors, including unhealthy diets, sedentary lifestyles, urbanization, socioeconomic status, genetic predisposition, and environmental factors. Tackling this complexity requires coordinated efforts across sectors like health, agriculture, urban planning, and education.
- **Limited Collaboration:** Ministries and organizations tend to operate in silos. For instance, health ministries may address clinical management, but agricultural policies that promote unhealthy diets often remain unaligned.
- **Policy Gaps:** Many countries lack comprehensive policies addressing the upstream determinants of obesity, such as marketing unhealthy foods to children, urban designs discouraging physical activity, and access to affordable healthy food [23].

Arrest the damage early, which is being caused by obesity epidemic

- *Dr. Jagmeet Madan*

3. Insufficient Service Delivery Mechanisms

- **Obesity Care Neglected in Healthcare Systems:** Studies show that healthcare systems often fail to prioritize obesity as a disease. Screening, counselling, and treatment options remain limited, especially at the primary healthcare level.
- **Poor Perception of Treatment Need:** Public perception often normalizes obesity, resulting in delayed healthcare-seeking behaviour. Additionally, the stigma associated with obesity discourages individuals from seeking help.
- **Focus on Curative Over Preventive Approaches:** Health systems tend to focus on managing obesity-related complications (e.g., diabetes, cardiovascular diseases) rather than implementing preventive strategies.

4. Socioeconomic and Cultural Barriers

- **Economic Constraints:** Policies encouraging healthy eating often fail to account for the financial burden on low-income populations, for whom calorie-dense, unhealthy foods are often cheaper and more accessible.
- **Cultural Norms:** In some cultures, higher body weight is associated with prosperity and health, reducing the urgency to address obesity.
- **Social Stigma:** The stigma surrounding obesity exacerbates mental health challenges and discourages individuals from engaging in weight-loss programs.

5. Evidence and Data Gaps

- **Lack of Research:** Limited country-specific data on obesity prevalence, socioeconomic drivers, and intervention effectiveness hampers evidence-based policymaking.
- **Inadequate Monitoring and Evaluation:** Few countries have robust systems for monitoring obesity trends or evaluating the impact of interventions, making it challenging to scale effective programs.

6. Missed Opportunities for Multisectoral Action

- **Education Sector:** Schools could play a pivotal role in obesity prevention through nutrition education, physical activity promotion, and healthy food environments. However, these efforts are often fragmented or underfunded.
- **Agriculture and Food Industry:** Policies to promote the production and consumption of healthier foods, such as subsidies for fruits and vegetables or regulation of processed foods, are underdeveloped.
- **Urban Planning:** Cities often lack infrastructure that promotes active living, such as walkable spaces, parks, and cycling tracks.
- **Private Sector & Food industry Involvement:** The food and beverage industry often prioritizes profits over public health by marketing unhealthy products. Collaborative approaches to reformulate products or limit marketing to children are underutilized.

Section 6:

Social and Public Health Aspects of Obesity

Obesity is a multifaceted issue influenced by various social determinants and public health factors. Key contributors such as urbanization, income growth, and the role of the internet shape the prevalence, perception, and management of obesity worldwide.

1. Urbanization and Obesity

Urbanization has been a significant driver of changes in lifestyle and dietary patterns, contributing to the rising prevalence of obesity.

- **Dietary Shifts:** Urban areas provide greater access to processed and calorie-dense foods through supermarkets, fast food outlets, and street vendors. These foods often replace traditional, nutrient-rich diets.
- **Reduction in Physical Activity:** The design of urban environments often discourages physical activity. Factors include:
  - Limited walkable spaces or cycling infrastructure.
  - Increased reliance on motorized transport.
  - Sedentary jobs and lifestyles common in urban settings.
- **Built Environment Challenges:** Urban sprawl, traffic congestion, and lack of green spaces hinder active living.
- **Socioeconomic Disparities:** Low-income urban populations face "food deserts" (lack of access to healthy food) or "food swamps" (abundance of unhealthy food), making healthy living a challenge.

Whatever you are doing do with your heart, whatever you eat do with your heart but be calorie conscious

- *Dr. K Madan Gopal*

2. Income Growth and Economic Changes

Rising incomes can influence obesity prevalence in complex ways.

- **Dietary Transition:** Higher disposable income often leads to increased consumption of high-calorie processed foods, sugary beverages, and fast food.
- **Access to Food:** While income growth can improve access to food, it often skews towards calorie-dense, nutrient-poor diets.
- **Globalization of Diets:** Economic development has led to the globalization of fast-food chains and westernized diets, which are often high in sugar, fat, and sodium.
- **Increased Sedentarism:** Economic growth and industrialization have shifted populations from physically demanding jobs (e.g., agriculture, manual labour) to sedentary office jobs, contributing to weight gain.
- **Health Inequities:** Although income growth has improved access to healthcare for some, disparities remain. Lower-income groups in high-income countries often experience higher obesity rates due to limited access to healthy foods and healthcare [55].

3. Internet, Technology, and Obesity

The internet and technological advancements play a dual role, both contributing to and combating obesity.

Contributors to Obesity

- **Sedentary Behaviour:**
  - Increased screen time (e.g., social media, streaming services, and gaming) leads to reduced physical activity levels [56].
  - Digital platforms encourage prolonged sitting, a key risk factor for obesity.
- **Food Marketing and Advertisements:**
  - Online advertising, particularly targeted at children and adolescents, promotes unhealthy food choices, including sugary snacks and fast food.
  - Social media influencers often promote calorie-dense, unhealthy products, normalizing their consumption.
- **Convenience and Food Delivery Apps:**
  - The rise of online food delivery platforms has made unhealthy food options more accessible and convenient.

  - Frequent use of these apps often correlates with increased consumption of fast food and higher caloric intake.

Opportunities for Obesity Prevention

- **Health and Fitness Apps:**
  - Mobile applications provide tools for weight management, such as calorie tracking, step counting, and guided workouts.
  - Gamified fitness challenges and wearable technology (e.g., fitness trackers) encourage physical activity [57].
- **Health Education:**
  - Online platforms offer health education resources, spreading awareness about balanced diets and active lifestyles.
  - Social media campaigns can promote healthy behaviours and obesity prevention.
- **Telemedicine and Online Counselling:**
  - Virtual consultations provide access to dietitians, fitness experts, and mental health professionals, making obesity care more accessible.
  - Digital health interventions, such as SMS-based reminders or virtual support groups, can encourage lifestyle modifications.

4. Other Social and Public Health Aspects

- **Cultural and Social Norms:**
  - In some cultures, higher body weight is associated with prosperity and health, reducing the perceived need for obesity prevention.
  - The stigma associated with obesity can lead to discrimination and mental health challenges, further complicating treatment and prevention.
- **Gender Disparities:**
  - Women, particularly in LMICs, are more likely to face weight-related stigma, limiting their participation in physical activities or healthcare-seeking behaviour.
- **Impact on Children:**
  - Childhood obesity is a growing concern, particularly in urban areas where children are exposed to unhealthy diets, sedentary lifestyles, and aggressive food marketing.
  - Schools often lack structured programs to combat childhood obesity, despite being a critical setting for intervention.
- **Public Health Infrastructure:**
  - Many health systems lack the infrastructure to provide integrated care for obesity. There is a greater focus on managing obesity-related complications (e.g., diabetes, cardiovascular diseases) rather than prevention.
  - Public health campaigns for obesity prevention remain underfunded compared to other health priorities.

WHO United Nations member states approved the WHO Acceleration Plan to stop obesity and established new guidelines for managing and preventing obesity at the 75th World Health Assembly in 2022.[58] The goal of the WHO Acceleration Plan to Stop Obesity is to encourage and facilitate multi-sector national action worldwide. The approach offers the possibility of a step change in delivery and impact in the endeavour to address the escalating obesity issue by using policies that have previously been tried, tested, and founded on implementation and delivery science. This serves as a succinct and general advocacy tool to educate governments, donors, stakeholders, and the general public about the Acceleration Plan's contents and developments. It can also be used to support related initiatives. The targets set by WHO have

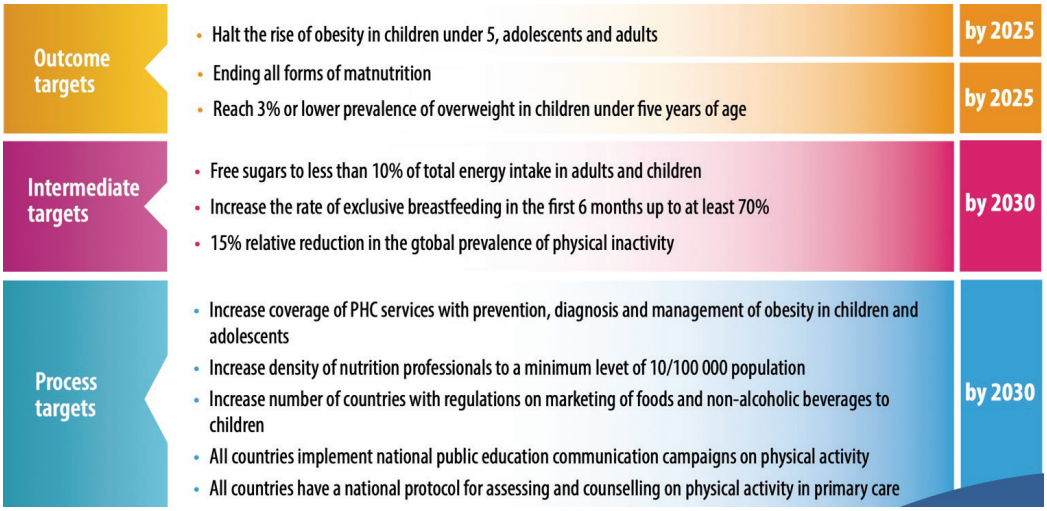


Figure 8: Targets set by the WHO Acceleration Plan to Stop Obesity (image from WHA 2022 report)

Section 7:

Clinical Care and Management of Obesity

Current Medical Therapies:

Examining physical characteristics associated with obesity is essential for accurate diagnosis and management. Common clinical features in obese individuals include hepatomegaly, xanthelasma, excess dorso-cervical fat deposition, and acanthosis nigricans. A thorough biochemical evaluation should include blood urea, serum creatinine, thyroid function tests, glycated haemoglobin (HbA1c), fasting lipid panel, and a 75g oral glucose tolerance test (OGTT). Additionally, investigations should assess for secondary causes of weight gain, such as hypothyroidism, polycystic ovarian syndrome (PCOS), Cushing's disease, and acromegaly. Documenting obesity-related co-morbidities is crucial for developing an effective management plan. Patients diagnosed with obesity may present with multiple co-morbid conditions, including type 2 diabetes mellitus (T2DM), hypertension, dyslipidemia, obstructive sleep apnoea, MASLD, proteinuria, osteoarthritis of weight-bearing joints, varicose veins, and lower limb edema.

These conditions contribute to the overall disease burden, necessitating a comprehensive evaluation and multidisciplinary management approach. [59–62] Cancers of the colon, oesophagus, kidney, endometrial, and postmenopausal breast are also linked to obesity.[50] Many patients with obesity experience mood disorders, low self-esteem, and a diminished quality of life. Identifying these psychological concerns is essential for comprehensive obesity management. Additionally, patients should be informed about the long-term financial implications of obesity-related co-morbidities, emphasizing the importance of early intervention and sustainable lifestyle modifications. Medical management of Obesity for Asian Indians explained in Table 2.

Table 2: Medical Management of Asian Indians with obesity

S.no.	Types of treatment	Components
1	Clinical work up (excluding history)	Physical exam: Height, weight, waist circumference, waist-hip ratio, body mass index, estimation of percentage body fat, Acanthosis nigricans, skin tags, xanthelasma, double chin, 'buffalo hump', tendon xanthoma, gynecomastia, excess supra-clavicular fat pads, striae, thyromegaly, hepatomegaly
		Laboratory tests: 75 g oral glucose tolerance test, glycated haemoglobin (HbA1c), fasting lipid panel, thyroid function test, blood urea and serum creatinine, serum cortisol#
2	Diet	Advise a hypo-caloric individualized diet.
3	Physical activity	Advise at least 60 min of physical activity (aerobic and resistance exercises) daily or 300 min of activity per week.
4	Pharmacotherapy	Orlistat (BMI ≥ 27 kg/m2 or a BMI of greater than 25 kg/m2with co-morbidities) Liraglutide for carefully selected individuals Judicious use of metformin, SGLT2 inhibitors and other GLP-1 agonists in obese diabetic individuals.
5	Bariatric surgery	For patients with BMI of 32.5 kg/m2 in the presence of co-morbidities and 37.5 kg/m2 in the absence of co-morbidities

Non-Pharmacological Approaches

Lifestyle Modifications:

The cornerstone of obesity management is lifestyle modification, encompassing dietary changes, physical activity, stress management, and adequate sleep. A balanced diet, rich in nutrient-dense foods, with controlled caloric intake and minimal ultra-processed food consumption, is essential for both weight loss and long-term maintenance. Regular physical activity, including aerobic and resistance exercises, enhances metabolism and fat reduction. Additionally, stress management techniques, such as mindfulness and meditation, help prevent emotional eating, while maintaining 7–9 hours of sleep per night prevents metabolic dysregulation that contributes to obesity.

Weight Loss:

Educating patients on the health benefits of weight loss is essential for enhancing motivation and adherence to lifestyle modifications. Evidence from clinical trials highlights significant benefits. The Diabetes Prevention Program (DPP) demonstrated a 58% reduction in diabetes incidence among individuals who reduced body weight by at least 7% through a hypocaloric diet and 150 minutes of moderate-intensity physical activity per week. The Look AHEAD (Action for Health in Diabetes) study found that a 5–10% weight loss over one year led to improved glycaemic control and reduced cardiovascular disease (CVD) risk factors. These findings underscore the importance of structured weight management programs in preventing and managing obesity-related complications. [63] Improvements in MASLD, osteoarthritis, urine incontinence, depression, obstructive sleep apnoea, mobility, and quality of life are among the additional advantages of weight loss. [64]

Table 3: Benefits Associated with 5–10% Weight Loss in Patients with Diabetes.

S.No.	Benefit	Odds ratio (95% confidence intervals)
1	0.5% reduction in HbA1c*	3.52 (2.81–4.40)
2	5 mm reduction in systolic blood pressure	1.56 (1.27–1.91)
3	5 mm reduction in diastolic blood pressure	1.48(1.20–1.82)
4	5 mg/dl increase in HDL cholesterol	1.69 (1.37–2.07)
5	40 mg/dl reduction in triglycerides	2.20 (1.71–2.83)

Available and Emerging medical Therapies:

Emerging treatments in India include newer GLP-1 receptor agonists like **semaglutide**, which show promise in achieving a significant weight loss. Other potential therapies in development include dual agonists targeting GLP-1 and GIP receptors and drugs affecting appetite-regulating hormones like leptin and ghrelin. These therapies could expand the treatment arsenal for obesity in the near future.

Approved Anti-Obesity Medications in India:

India has limited options for anti-obesity medications that are approved for use. The commonly available drugs include:

- **Orlistat:** A lipase inhibitor that reduces fat absorption in the intestine, commonly prescribed for obesity management.
- **Phentermine:** A short-term appetite suppressant approved in select scenarios.
- **Liraglutide:** A GLP-1 receptor agonist approved for weight management, though its availability and cost pose challenges.

Emerging Medical Therapies and Research

1. **Semaglutide (GLP-1 Receptor Agonist): [65]**
   - Globally, Semaglutide has emerged as a game-changer in obesity management, offering substantial weight loss. It mimics the hormone GLP-1, reducing appetite and enhancing satiety.
   - **Status in India:** Oral Semaglutide is available in India as an antidiabetic medication, it is not yet approved as an anti-obesity drug. Advocacy for regulatory approval could expand treatment options for obesity.
2. **Dual and Triple Agonists:**
   - **Dual GLP-1 and GIP Receptor Agonists:** Tirzepatide, a dual agonist targeting GLP-1 and GIP receptors, has shown remarkable weight loss results in clinical trials and is considered a breakthrough therapy internationally. Its potential introduction in India could revolutionize obesity management. [66]. It has been given market authorization as antiobesity drug in India.
   - **Triple Agonists:** Drugs targeting GLP-1, GIP, and glucagon receptors (Retatrudide) are currently under development and may provide even greater efficacy in weight reduction.
3. **Appetite-Regulating Hormones:**
   - Emerging therapies targeting hormones like leptin and ghrelin, which regulate hunger and satiety, are being studied. These drugs aim to address the biological drivers of obesity, providing more sustainable results.
4. **Future Pipeline Therapies:**
   - Research in obesity pharmacotherapy is exploring new mechanisms, including inhibitors of the melanocortin-4 receptor and mitochondrial uncouplers, which could reshape the treatment landscape in the coming years. [67]

Challenges in Medical Management of Obesity in India

1. **Limited Availability of Approved Drugs:**
   - Many globally approved obesity treatments remain unavailable in India due to regulatory and market barriers.
2. **High Cost of Treatment:**
   - Advanced therapies like GLP-1 receptor agonists are expensive, making them inaccessible for a significant portion of the population.
3. **Low Awareness:**
   - Obesity is still not widely recognized as a medical condition in India, leading to underutilization of pharmacotherapy.
4. **Focus on Comorbidities:**
   - Most healthcare systems prioritize treating obesity-related conditions (e.g., diabetes, hypertension) rather than addressing obesity as a root cause.

   Key anti obesity medicience in india are listeed in table 4

Table 4: Key Anti-Obesity Medications Available in India

Medication	Mechanism of Action	Availability in India	Remarks
Orlistat	Inhibits fat absorption in the intestine	Yes	Affordable and commonly prescribed.
Phentermine	Appetite suppressant	Yes	Approved for short-term use.
Liraglutide	GLP-1 receptor agonist	Limited	High cost limits widespread usage.
Semaglutide	GLP-1 receptor agonist (off-label for obesity)	No (for obesity)	Approved for diabetes, not obesity.
Tirzepatide	Dual GLP-1 and GIP receptor agonist	No	Received Market authorization as anti-obesity drug in India.

Role of Bariatric Surgery:

Bariatric surgery, such as gastric bypass and sleeve gastrectomy, remains one of the most effective interventions for severe obesity and its complications. It is especially beneficial for individuals who fail to achieve weight loss through non-surgical methods. However, access to bariatric surgery in India is limited due to high costs, lack of awareness, and inadequate availability of specialized centres. Additionally, surgical procedures come with risks and require lifelong follow-up for nutritional deficiencies and lifestyle adjustments. [68]

In summary

Managing obesity requires a multifaceted approach combining lifestyle changes, pharmacological interventions, and surgical options tailored to individual needs, while addressing systemic challenges to ensure broader accessibility in India.

A multidisciplinary approach involving various specialists is essential for effective diagnosis and management of obesity and its related complications, ensuring that the process is evidence-based. The composition of this team should be adapted to the availability of specialists and the setting (whether urban or rural). An evaluation of the patient's comorbidities and medication history is crucial, as these factors may influence obesity.

Managing these underlying conditions should be the first step before addressing other risk factors and planning further obesity treatment. The involvement of specialists is vital for providing comprehensive support across nutrition, fitness, pharmacotherapy, psychological care, and surgical intervention. Each specialty can contribute to the implementation of a personalized, evidence-based treatment plan, tailored to help patients achieve their obesity treatment goals effectively.

Shared decision-making, which begins with a thorough assessment by the appropriate team and continues with regular evaluations and modifications of the treatment plan, is key to achieving optimal, sustained results. Setting realistic goals are fundamental for the success of obesity management. Achieving these goals improves patient adherence to treatment. Treatment goals must be attainable and sustainable, taking into account factors that contribute to weight gain, such as stress, depression, lack of time, and underlying comorbidities.

In order to effectively control obesity in India, lifestyle interventions that mostly involve food changes are crucial, that too at early stage of life. Together with dietary changes, exercise is essential for reaching weight loss goals and managing metabolic comorbidities.

Section 8:

Why Obesity Management does not Get Due Priority?

Community-based programs play a pivotal role in obesity prevention and management. School-based initiatives focus on incorporating nutrition education, promoting physical activity, and providing healthy meals to reduce childhood obesity [69]. Workplace wellness programs, including fitness challenges, ergonomic adjustments, and stress-relief activities, encourage adults to adopt healthier lifestyles. These interventions create a supportive environment that fosters long-term behaviour change and reduces obesity at the population level [70].

Obesity treatment often lacks priority in healthcare systems due to its perception as a lifestyle issue rather than a serious medical condition. Unlike communicable diseases or acute illnesses, obesity is viewed as a personal failure rather than a complex condition influenced by genetic, environmental, and behavioural factors. This misconception results in delayed treatment and inadequate resource allocation for preventive and management strategies. Additionally, healthcare providers often focus more on addressing its comorbidities, such as diabetes or cardiovascular disease, rather than tackling obesity as the root cause.

Health System Barriers

The healthcare system in India faces significant barriers in addressing obesity. Limited resources, such as funding and specialized clinics, constrain the scope of treatment options. There is also a lack of trained professionals in obesity management, including dietitians, exercise physiologists, and bariatric surgeons. Additionally, inadequate infrastructure, especially in rural areas, prevents timely diagnosis and intervention. These systemic shortcomings impede the integration of obesity care into routine healthcare services, leaving many patients untreated [26,30].

Socioeconomic Factors

Affordability and accessibility are major aspects for obesity treatment in India. Low-income populations struggle to afford consultations with specialists, medications, or bariatric surgery, which are often expensive. Access to healthy food options is limited, particularly in urban slums and rural areas where calorie-dense, nutrient-poor foods are more affordable and readily available. These disparities highlight the need for subsidized programs and policies to make obesity care more inclusive and equitable.

Cultural Challenges

Cultural perceptions of obesity in India pose unique challenges. Being overweight is sometimes associated with prosperity or good health, leading to under-recognition of obesity as a serious issue. Societal norms often stigmatize individuals with obesity, discouraging them from seeking help. Additionally, there is widespread misinformation about weight management, with fad diets and unscientific remedies being prioritized over evidence-based approaches. Overcoming these cultural barriers requires public education campaigns to normalize discussions around obesity and promote science-backed interventions [22,43].

School Children and Social Perception Towards Obesity

Childhood obesity is often overlooked, with schools and families failing to address the issue early. Social perceptions further complicate the problem, as children with obesity frequently face bullying and discrimination, affecting their self-esteem and mental health. Schools, which are ideal settings for early intervention, often lack structured programs focusing on nutrition and physical activity. Misguided views among parents, such as associating chubbiness with healthiness, further delay the identification and treatment of obesity in children [69].

Figure 10. SWOT Analysis of Obesity care situation in India

Section 9:

Experts Converge on Need for Urgent Actions

This section summarises the stakeholders & experts perspectives on obesity as a public health crisis, highlighting key challenges, management strategies, and policy recommendations. The need for a multi-sectoral approach is emphasized, integrating preventive, clinical, and policy-driven interventions to effectively combat obesity.

Experts agreed thatObesity is rapidly increasing in India due to changing dietary habits, sedentary lifestyles, and inadequate public awareness. It is a significant contributor to non-communicable diseases (NCDs) such as diabetes, cardiovascular diseases, and hypertension, leading to an increasing economic and healthcare burden. The rising prevalence of obesity among children and adolescents is particularly concerning, as it predisposes them to early-onset diabetes, metabolic syndrome, and psychological distress, significantly impacting long-term health outcomes.

Obesity affects both physical and mental health, with long-term consequences for individuals and society. Adults with obesity are at increased risk for type 2 diabetes, hypertension, dyslipidaemia, obstructive sleep apnoea, and osteoarthritis. They also experience higher rates of depression, anxiety, and reduced quality of life, often leading to lower workforce participation and productivity losses. Children with obesity are more likely to develop insulin resistance, fatty liver disease, orthopaedic issues, and cardiovascular risks. Additionally, childhood obesity often persists into adulthood, reinforcing generational cycles of poor health and increasing the burden on healthcare systems.

Despite the increasing prevalence of obesity, India's healthcare system lacks a structured approach to obesity prevention and management. The fragmented healthcare infrastructure often treats obesity in isolation rather than integrating it into comprehensive chronic disease management programs.

Major gaps:

- Lack of national screening programs for early obesity detection.
- Limited integration of obesity care into primary healthcare services.
- Reactive rather than preventive interventions, focusing on treating complications instead of promoting healthier behaviours.

The rising incidence of obesity in the country requires us to think about health, nutrition, and lifestyle in a more holistic manner

- *Mr. Pawan Agarwal*

- Inadequate training for healthcare providers in obesity management, leading to inconsistent treatment approaches.
- Limited Health insurance coverage for obesity-related treatments, making bariatric surgery and pharmacological interventions financially inaccessible.

Current initiatives for tackling obesity

Several initiatives have been launched to address obesity, though they remain limited in scale and impact.

The POSHAN Abhiyaan (National Nutrition Mission): Primarily targets malnutrition but lacks a dedicated obesity prevention framework.

Fit India Movement promotes physical activity but does not integrate structured intervention programs. There is no national taxation on Sugar-Sweetened Beverages (SSBs) despite implemented in some states to discourage consumption. While these initiatives offer promising interventions, they lack a coordinated national strategy to comprehensively address obesity. A recent notable initiative, 'Let's Fix Our Food' aims to address unhealthy foo advertising targeted at children and to create healthier school food environments.

Key steps to tackle obesity

Obesity management requires a multidimensional approach that includes lifestyle modifications, medical interventions, and behavioural strategies. Encouraging balanced nutrition, portion control, and regular physical activity is crucial.

Structured weight management programs should be incorporated into healthcare services. Anti-obesity medications such as GLP-1 receptor agonists and dual GLP-1 & GIP receptor agonists have shown promising results but remain underutilized due to high costs and lack of accessibility. Bariatric Surgery is recommended for patients with severe obesity or associated metabolic conditions, but availability remains limited due to infrastructural and financial barriers. Addressing emotional eating, mental health concerns, and lifestyle habits through counselling and structured programs is essential. A whole-of-society approach is necessary to combat obesity.

The government, healthcare sector, food industry, education sector, and community organizations must collaborate to implement effective strategies. The government needs to establish national obesity guidelines, integrate obesity care into primary healthcare, and regulate unhealthy food marketing while the healthcare sector should develop specialized training for obesity management and ensure equitable access to treatments. In addition, food industry must be regulated to improve food labelling, reduce ultra-processed food production, and limit misleading advertisements. Additionally, education sector should incorporate nutrition education and physical activity programs in schools to instil lifelong healthy habits. The NGOs and civil society groups should play a role in public awareness campaigns and grassroots health promotion efforts.

To enhance obesity prevention and management, experts recommended to develop National Guidelines and establish standardized clinical protocols for obesity prevention and treatment within primary healthcare systems.

There is a need to ensure insurance policies cover obesity treatments, including bariatric surgery and pharmacological interventions while implementation of stricter labelling laws and taxation on ultra-processed foods to promote healthier dietary habits. There should be an investment in urban planning strategies that encourage walkability, cycling, and recreational spaces. In addition, surveillance systems should be strengthened to track obesity trends and inform evidence-based policymaking. The current existing

> *"I really hope that more organizations work on this, and more of them fund this work, and the government and private sector, devises solutions for this, because 10 or 15 years down the line, this will be the epidemic that would be attacking India"*

initiatives like POSHAN Abhiyaan should be expanded to include obesity-focused interventions and nationwide awareness programs on nutrition, physical activity, and obesity-related risks should be launched.

Addressing obesity requires a coordinated, multi-sectoral approach, integrating public health interventions, policy reforms, and behavioural strategies. Obesity is a silent epidemic that demands urgent and sustained action at multiple levels. Strengthening policy frameworks, increasing public awareness, and ensuring equitable access to healthcare services is critical to mitigating the obesity burden in India.

Section 10:

The Role of Stakeholders

Table 5: Stakeholder in Obesity care in India

Stakeholder	Level of Influence	Key Need/Focus
National and State Governments	High	Policy formulation, funding, enforcement
Health Departments	High	Program implementation, healthcare integration
Food Regulatory Bodies	High	Ensuring food safety, regulating unhealthy food production
Academic & Research Institutions	Medium	Evidence generation, innovative solutions
Finance Departments	Medium	Allocation of subsidies, taxation policies
Transport Departments	Medium	Active urban planning, pedestrian-friendly spaces
Schools & Teachers	Medium	Obesity prevention through education
Parents, Families and communities	Medium	Supporting healthy lifestyles at home
Pharmaceutical Companies	Medium	In ensuring access to affordable medicines
Industry Associations	High	Promoting ethical practices in the food and beverage industry
Doctors and Professional Associations	High	Obesity management, advocacy, and capacity building
Obesity & Diabetes Societies	Medium	Advocacy and patient support

Let's glance at each possible role of each of the stakeholders in the obesity prevention & managments

1. Governments at National and State Levels

Governments hold the most significant influence in creating policies and allocating resources for obesity prevention and management. Both national and state governments have the authority to integrate obesity care into existing health and social policies.

- Formulate evidence-based, multi-sectoral policies aimed at obesity prevention. Examples include laws mandating clear food labelling, restricting the advertisement of unhealthy foods to children, and regulating the sale of sugar-sweetened beverages.
- Increase funding for obesity-related initiatives, such as community health programs, research, and healthcare infrastructure improvements.
- Create a task force to align the efforts of various ministries, such as education, health, food regulation, and urban planning, ensuring that policies are implemented cohesively.
- Promote public-private partnerships to leverage the expertise and resources of private stakeholders in combating obesity.

2. Health Departments

Health departments are responsible for operationalizing national and state policies by designing and implementing healthcare programs and integrating obesity management into the existing healthcare framework..

- Develop and implement obesity screening programs at the primary healthcare level to ensure early diagnosis and intervention.
- Train healthcare professionals, including doctors, nurses, and community health workers, to provide nutritional counselling and lifestyle interventions tailored to diverse populations.
- Facilitate collaborations with academic institutions to monitor and evaluate the impact of obesity-related programs, ensuring continuous improvement.
- Scale up obesity management services by providing affordable access to pharmacological treatments and bariatric surgery for severe cases.

3. Food Regulatory Bodies (e.g., FSSAI)

Food regulatory bodies have a direct impact on the food environment, shaping public consumption patterns through regulations and policies.

- Implement strict food labelling norms that mandate the disclosure of sugar, fat, and calorie content on all processed food products.
- Monitor and restrict the marketing of unhealthy foods, especially those targeting vulnerable groups like children and adolescents.
- Incentivize the production and sale of healthier alternatives, such as fortified foods and low-sugar beverages, by providing subsidies or tax benefits to manufacturers.
- Collaborate with state governments to ensure compliance with food safety and advertising regulations at the grassroots level.

4. Finance Departments

Fiscal policies play a crucial role in shaping public health behaviour by influencing the cost and accessibility of healthy and unhealthy food choices.

- Impose higher taxes on sugar-sweetened beverages, ultra-processed foods, and high-fat snacks to discourage their consumption.
- Provide subsidies for fresh produce, whole grains, and healthy snacks to make them more affordable and accessible to the general public.
- Allocate a dedicated budget for public awareness campaigns, healthcare capacity building, and obesity-related research.
- Support innovations in food production and urban planning by offering grants and financial incentives.

5. Academic and Research Institutions

Academic and research institutions play a critical role in generating evidence, evaluating programs, and developing innovative solutions for obesity prevention and management.

- Conduct epidemiological studies to track obesity trends and identify risk factors unique to the Indian population.
- Develop community-based interventions tailored to specific demographics, including children, adolescents, and rural populations.
- Evaluate the efficacy, cost-effectiveness, and scalability of existing public health programs to inform future policy decisions.

- Collaborate with government and industry stakeholders to design culturally sensitive nutrition and physical activity programs.

6. Transport Departments

Transport departments contribute by designing infrastructure that promotes active lifestyles, such as walking, cycling, and public transport use.

- Design urban spaces with pedestrian-friendly pathways, cycling tracks, and jogging parks to encourage physical activity.
- Ensure public transport systems are integrated with active commuting options, such as bike-sharing schemes and walkable access points.
- Collaborate with urban planning bodies to create "green spaces" in both rural and urban areas, promoting recreational physical activity.

7. Schools, Teachers, and School Management

Schools are critical settings for early-life interventions, shaping long-term health behaviours among children and adolescents.

- Include nutrition education and physical activity as part of the core curriculum.
- Ensure school cafeterias provide healthy meal options and limit access to sugary beverages and snacks.
- Organize health awareness events involving parents and community members to promote family-based interventions for obesity prevention.

8. Pharmaceutical industries

The pharmaceutical industry need to coordinate and develop and ensure affordable access to anti-obesity medicines for a wider section of population.

- Non upon to Expedited availability of newer therapies and drugs which are already available in high income countries in the Indian market.
- Support & facilita for more and local data availability from India on these medications.

9. Industry Associations

- Industry associations, particularly in the food and beverage sectors, have a dual role in ensuring ethical practices and collaborating on public health initiatives.
- Develop voluntary guidelines to reduce sugar, salt, and fat content in processed foods.
- Partner with the government to support public awareness campaigns and fund community health programs.
- Commit to responsible marketing practices that do not target vulnerable populations, especially children.

10. Doctors and Professional Associations

Doctors and their associations, including obesity societies and diabetes and endocrine societies, are essential in delivering care and advocating for better obesity management policies.

- Advocate for obesity care to be prioritized in public health agendas.
- Train members to offer comprehensive obesity care, including dietary counselling, pharmacological interventions, and bariatric surgery referrals.
- Provide inputs to policymakers on the scientific aspects of obesity management and prevention strategies.

10. Parents, Family and communities

Parents are the primary influencers of children's dietary and physical activity habits, particularly during early childhood.

- Provide nutritious, balanced meals at home and limit the consumption of processed foods.
- Encourage children to participate in physical activities, sports, or outdoor play.
- Educate themselves about healthy lifestyle practices and adopt them to set an example for their children.

Section 11:

Policy Recommendations and The Way Forward

Obesity care in India requires a dual approach of supply-side (policy-driven) and demand-side (public-focused) interventions. Adopting the five workstream approach from the WHO Accelerated Plan to Stop Obesity, following recommendations are need to be consider:

1. Prevention Strategies

Prevention is the cornerstone of addressing obesity. A multi-pronged approach can help reduce the prevalence of obesity:

- **Healthy Eating Promotion:** Introduce fiscal policies to make healthy food options affordable and accessible while discouraging unhealthy choices through higher taxes on sugar-sweetened beverages and ultra-processed foods. For example, provide subsidies on fresh fruits and vegetables and restrict the marketing of unhealthy food to children.
- **Urban Infrastructure:** Prioritize active urban design by building pedestrian-friendly pathways, cycling tracks, and parks. These can encourage active commuting and outdoor activities, making physical activity a part of daily life.
- **School-Based Interventions:** Include mandatory physical education classes and nutrition awareness in school curriculums. Additionally, regulate the availability of junk food in and around schools, promoting healthier alternatives.
- **Workplace Wellness:** Encourage employers to create wellness programs that integrate fitness challenges, mental health counselling, and healthy eating options at workplaces.

2. Strengthening Healthcare Systems

The health system must be geared toward integrating obesity care at all levels:

- **Integration with Primary Healthcare:** Expand the scope of Health and Wellness Centres under Ayushman Bharat to include obesity detection and management services. Establish these centres as the first point of care for obesity-related issues.
- **Equipping PHCs:** Provide primary healthcare centres with equipment like BMI measurement tools and trained personnel to diagnose and manage obesity.
- **Healthcare Worker Training:** Design programs to train healthcare workers—general physicians,

nurses, and community health workers—in early diagnosis, counselling, and referral systems for obesity care.

- **Referral Pathways:** Develop standardized referral systems from primary to secondary and tertiary care centres, ensuring access to advanced services like bariatric surgery when necessary.

3. Capacity Building

Building capacity is essential to ensure the availability of skilled professionals and resources to tackle obesity:

- **Specialist Development:** Invest in the creation of a cadre of obesity care specialists, including dietitians, bariatric surgeons, and endocrinologists. Partner with medical and paramedical institutions to offer specialized training in obesity care.
- **Continuous Education Programs:** Develop certification courses and workshops to upskill existing healthcare professionals in evidence-based practices for obesity management.
- **Policymaker Awareness:** Educate policymakers about the long-term health and economic impacts of obesity and the benefits of investing in prevention and care strategies.

4. Access to Proven Therapies

Expanding access to safe and effective medical treatments is critical for managing obesity:

- **Expedited Approval for New Drugs:** Fast-track the licensing of globally recognized anti-obesity medications, such as GLP-1 receptor agonists (e.g., semaglutide), and ensure their affordability and availability.
- Available of approved AON through govt facility: Eligible patients should have access to the medications through government hospitals and reimbursement through private insurance and govt sponsored insurance plans.
- **Pharmaceutical Research Incentives:** Provide incentives to Indian pharmaceutical companies to develop and test cost-effective obesity drugs that cater to the unique genetic and cultural characteristics of the Indian population.
- **Regulation and Monitoring:** Ensure stringent regulatory oversight for anti-obesity therapies to maintain safety and efficacy standards, while curbing the misuse of unproven or unsafe treatments.

5. Public Awareness Campaigns

Awareness campaigns are crucial to addressing societal stigma and educating communities:

- **Culturally Sensitive Messaging:** Design public health campaigns that resonate with diverse Indian communities, emphasizing the health risks of obesity and the benefits of lifestyle changes. For example, highlight traditional diets and physical activities rooted in Indian culture.
- **Mass Media Utilization:** Use television, radio, and digital platforms to spread messages about the importance of healthy eating and physical activity. Promote success stories of individuals who have achieved weight loss to inspire communities.
- **Engaging Schools and Workplaces:** Involve schools in spreading awareness among children and their families, and workplaces in educating employees about obesity prevention and management.
- **Leveraging Technology:** Promote the use of mobile apps and social media platforms for monitoring weight, tracking diet and exercise, and offering virtual counselling sessions for obesity care.

6. Multi-Sectoral Collaboration

Tackling obesity requires the involvement of multiple sectors:

- **Health and Education Collaboration:** Ensure schools implement comprehensive nutrition and physical activity programs to instil healthy habits in children from a young age.
- **Urban Planning and Agriculture Coordination:** Promote policies that support urban designs for active living and sustainable agriculture that focuses on healthy food production.
- **Private Sector Involvement:** Partner with private healthcare providers and NGOs to extend the reach of obesity care services, particularly in rural and underserved areas.
- **Industry Engagement:** Work with the food and beverage industry to reformulate products, reduce unhealthy ingredients, and introduce clear labelling practices to guide consumers.

Conclusion:

A thorough, multisectoral strategy including clinical, policy, and preventive approaches is

needed to address obesity in India. Integrating obesity care into primary healthcare services is a crucial step, utilizing initiatives such as Ayushman Bharat Health & wellness program to provide long-term follow-up, management, and early screening. Public awareness initiatives need to be culturally aware and focus on lowering the stigma associated with obesity in addition to promoting physical exercise and a nutritious diet.

The national health agenda should place obesity at the top of strengthened policy frameworks, with a focus on community involvement, financial sustainability, and the life-course approach to prevention. By offering accessible public recreation areas, bike lanes, and safe pedestrian routes, urban infrastructure should promote active lifestyles. Setting-based interventions that encourage healthy habits must be implemented in businesses and schools.

Building capacity is crucial for educating medical professionals on how to successfully manage obesity, and it is backed by the licensing and approval of new treatments. To guarantee coordinated efforts, cooperation between stakeholders—including governmental organizations, trade associations, and public health specialists—is essential. In order to achieve equitable and sustainable obesity care throughout India, it would be essential to address socioeconomic drivers such as urbanization and dietary changes in addition to community-driven programs.

Abbreviations

ABCD	Adiposity-Based Chronic Disease
BMI	Body Mass Index
CVDs	Cardiovascular Diseases
CNNS	Comprehensive National Nutrition Survey
DALYs	Disability-Adjusted Life Years
FDA	Food and Drug Administration
FSSAI	Food Safety and Standards Authority of India
GDP	Gross Domestic Product
GLP-1	Glucagon-Like Peptide-1
HWCs	Health and Wellness Centres
ICU	Intensive Care Unit
LASI	Longitudinal Ageing Study in India
MNT	Medical Nutrition Therapy
NAFLD	Non-Alcoholic Fatty Liver Disease
NCDs	Non-Communicable Diseases
NFHS	National Family Health Survey
NP-NCD	National Programme for Prevention and Control of Non-Communicable Diseases
OECD	Organisation for Economic Co-operation and Development
PCP	Primary Care Physician
PHC	Primary Healthcare Centre
RKSK	Rashtriya Kishor Swasthya Karyakram
SBCC	Social and Behaviour Change Communication
SDG	Sustainable Development Goal
SGLT2	Sodium-Glucose Co-Transporter-2
T2DM	Type 2 Diabetes Mellitus
WHO	World Health Organization

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Annexure

1. Screening and Diagnosis

Table 6: Comparison of parameter of obesity in South Asian and Western Population

Parameter	Level in South Asians	Level in Western population
Waist circumference		
Men	≥90 cm	≥102 cm
Women	≥80 cm	≥88 cm
Waist-Hip Ratio		
Men	≥0.9	≥0.9
Women	≥0.8	≥0.8
Body fat percentage		
Men	≥20%	≥25%
Women	≥33%	≥35%

Table 7: Definition of overweight and Obesity as per BMI in different regions worldwide

Region/ Organization	BMI Range (kg/m^2)	Normal Weight	Overweight	Obese	Reference
International (WHO)	18.5–25.99	18.5–24.99	Pre-obese: 25–29.99	Class 1: 30–34.99, Class 2: 35–39.99, Class 3: ≥40	Weir C. B., et al., BMI Classification Percentile and Cut-Off Points, 2023
South Asia	>23.4–>26.6	>23.4	>25.2	≥26.6	Same as above
Indian Consensus Group (2009)	≥23	-	23–24.9	≥25	Misra A, et al., J Assoc Physicians India, 2009
Endocrine Society of India (2022)	18.5–22.9	18.5–22.9	23–24.9	Grade 1: 25–29.9, Grade 2: 30–34.9, Grade 3: >35	Madhu S. V., et al., Indian J Endocrinol Metab, 2022
Singapore Clinical Guidelines	18.5–24.9	18.5–24.9	25–29.9 (pre-obese)	Obese Class I: 30–34.9, Class II: 35–39.9, Class III: ≥40	Clinical Practice Guidelines-Obesity, Singapore, 2016
Malaysia National Guidelines	18.5–22.9	18.5–22.9	Pre-obese: 23–27.4	Obese I: 27.5–34.9, Obese II: 35–39.9, Obese III: ≥40	Clinical Practice Guidelines Management of Obesity, Malaysia, 2023
Children (0–19 years)					
0–60 months	WHO (2006)	>−2 to ≤2 SD	>2 to ≤3 SD	>3 SD	WHO Guidelines: Managing Overweight in Children, 2017
5–19 years	WHO (2007)	>−2 to ≤1 SD	>1 to ≤2 SD	>2 SD	WHO BMI-for-Age Reference Data, 2023

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