



UNDERSTANDING ADOLESCENT GIRLS' NUTRITIONAL STATUS: EVIDENCE FROM GLOBAL TO NATIONAL PERSPECTIVE

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ABSTRACT

Adolescence (10–19 years) is a critical period of rapid growth and development with increased nutritional needs. Adolescent girls are particularly vulnerable to anaemia and malnutrition due to growth, menstrual blood loss, gender inequalities, early pregnancy and limited access to health services. Globally, undernutrition, micronutrient deficiencies and anaemia coexist with rising overweight and obesity.

In India, the CNNS 2016–18 reported substantial levels of stunting, thinness and anaemia among adolescents, with about 40% of adolescent girls affected by anaemia. This article reviews the nutritional status, dietary practices, determinants and major nutrition programmes for adolescent girls in India. The evidence highlights the need for a life-course and multisectoral approach integrating nutritious diets, micronutrient interventions, health services, education and gender-responsive strategies.

KEY WORDS: Adolescent Girls, Nutrition, Anaemia, Malnutrition, Health

1. INTRODUCTION

Adolescence (10–19 years) is a critical period of rapid physical, physiological, psychological, and social development, with increased requirements for energy, protein, iron, calcium, folate, vitamin B12, zinc, and other micronutrients. For girls, menstruation increases iron needs and the risk of anaemia, particularly when dietary intake and access to health services are inadequate (WHO, 2023). Poor nutrition during adolescence can impair growth, immunity, learning, and physical performance and may increase risks during future pregnancy and childbirth. Adolescent nutrition is therefore important for breaking intergenerational cycles of malnutrition (UNICEF, 2023). At the same time, rising overweight and obesity alongside undernutrition and micronutrient deficiencies highlight the double or triple burden of malnutrition among adolescents.

2. OBJECTIVES

This article aims to

- Examine the nutritional status of adolescent girls from a global and Indian perspective.
- Describe the major forms of malnutrition affecting adolescent girls.
- Identify major biological, socioeconomic, dietary, environmental and gender-related determinants.
- Review major nutrition policies and programmes addressing adolescent girls in India.
- Identify evidence gaps and propose priorities for strengthening adolescent nutrition interventions.

3. METHODOLOGICAL APPROACH

This article adopts a narrative review approach rather than a systematic review. Evidence was drawn from authoritative international and national sources, including WHO, UNICEF, the Government of India, the National Health Mission and nationally representative surveys. Peer-reviewed studies using data from India's Comprehensive National Nutrition Survey (CNNS 2016–18) were also examined.

4. Discussion

4.1 Global and Regional Scenario of Adolescent Nutrition

To understand the adolescent health profile, the Sustainable Development Goals (SDGs) has focused on different domains of adolescent health and nutrition. However, there is overlapping in age coverage and studies reveals that SDGs are not able to cover all the dimensions of adolescent health (E. Wallengren et.al, 2024). The comprehensive analysis of adolescent health and nutrition measurement remain incomplete. In line of SDGs, the Global Action for measurement of Adolescent Health (GAMA) measures different domains of adolescents' health and well-being and covers the remaining gap in SDGs. The GAMA standardized the adolescents in two age bounds: younger adolescents (10–14 years) and older adolescents (15–19 years). The 47 GAMA indicators are effective to monitor the distinct challenges of younger and older adolescents separately. It provides a more comprehensive picture

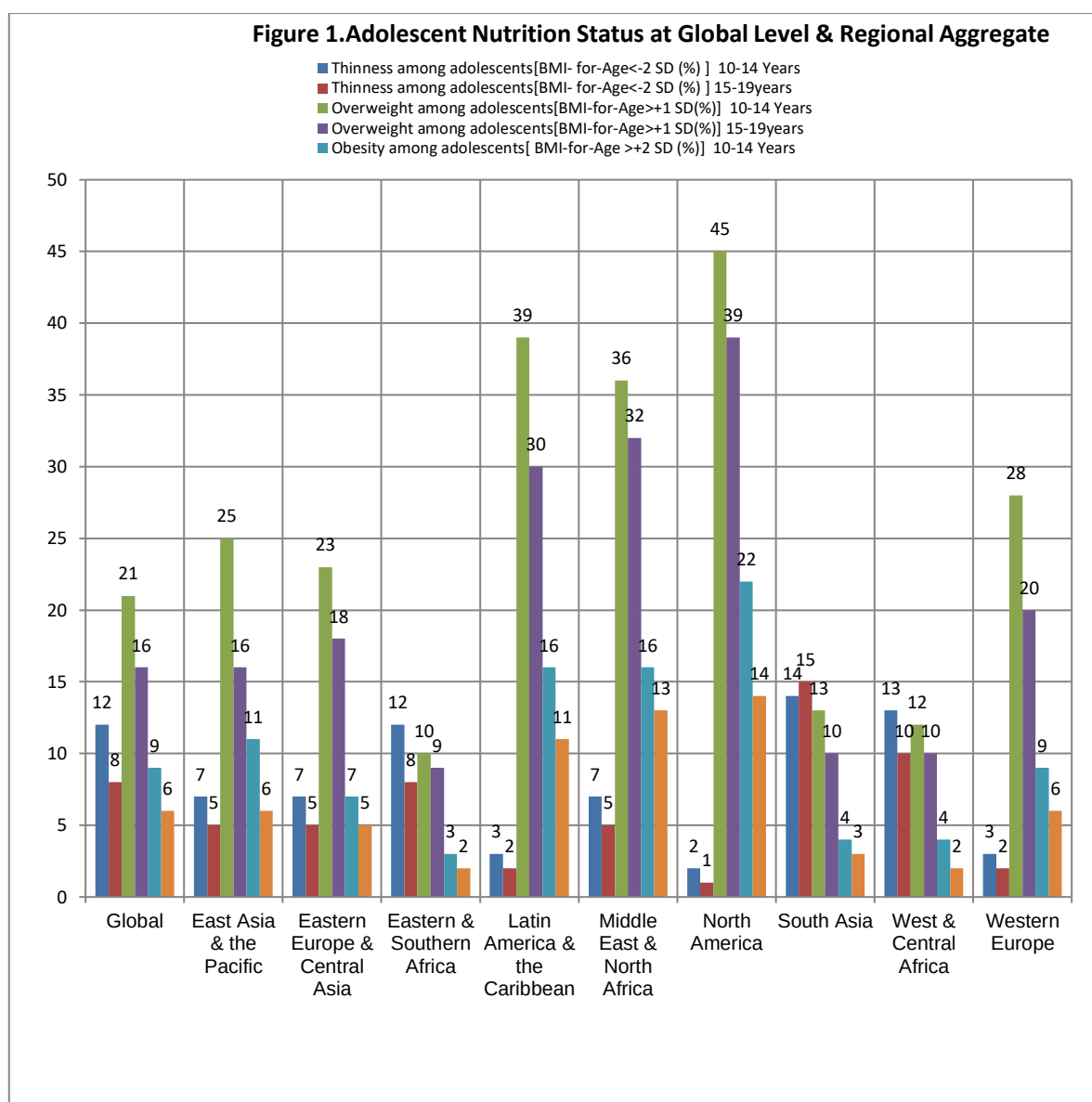


of adolescent health and nutrition and thereby interventions and development strategies could be undertaken for the improvement of adolescent nutrition status.

In the global setting and framework, the important dimensions of adolescent health and nutrition are discussed below.

4.1.1. Adolescent Nutrition Status at Global and Regional Perspective

The estimation of the global and regional children and adolescent nutrition by UNICEF, reveals that the top three regions of the world having overweight at all age group are Latin America and Caribbean, middle east and North Africa and North America. The study also shows that “ between 2000 and 2022,the prevalence of obesity increased by at least 2.5 times across all age group shown, while the prevalence of overweight increased by less than two fold.”. The overweight rate of young adolescent (10-14 years) was 12 percent globally which increased to 21 percent in 2022 and among the older adolescents (15-19 Years) it increased from 9 percent to 16 percent during the same period. The severe form of overweight is obesity which shows a rapid increasing rate all over the world. The children and adolescents aged 5-19 years who were obsessed was only 3 percent during 2000 which increased to 8 percent in the year 2022.



Source: Author's calculation from NCD Risk Factor Collaboration (NCD-RisC)(2024). DOI: [https://doi.org/10.1016/S0140-6736\(23\)02750-2](https://doi.org/10.1016/S0140-6736(23)02750-2)

4.1.2. Gender Disparity in Adolescence

In early childhood both boys and girls have to face unequal treatments in the society. However, as they move towards adolescence, the disparities or unequal treatment on girls increases. In most of the cases, the onset of puberty brings with it the restrictions,



unequal treatments and disparities to the girls. The free movement of adolescent girls' restricted, doing friendship, schooling etc. being restricted to girls' in many traditional societies. The burden of domestic work on girls' increases, pressure on early marriage, risk of early pregnancy and health status of girls' as well as their children become challenging.

The adolescent girls' have to spend more time on household chores than boys all over the world. It was estimated that globally 16 percent of younger adolescent girls' and 8 percent adolescent boys have to spend more than 21 hours per week in household chores. This disparity exists in all the regions of the world at different extent. The disparity is highest in South Asia , followed by Middle East and North Africa.

Table 1 Gender Disparities among Young Adolescents in Household Chores(in %)(Estimated at 21 hours per week)

Regions	Young Adolescent Boys	Young Adolescent Girls'	Total
Eastern and Southern Africa	24.7	32.2	28.4
West and Central Africa	10.3	17.9	14.1
South Asia	5.7	15.0	10.2
Middle East and North Africa	3.0	8.7	58
World	8.4	16.0	12.1

Source: UNICEF Global database 2022

4.1.3. Adolescent Mortality

The global adolescent mortality rate was 7 in per one thousand children aged 10, during 2024(Table 2) . The adolescent mortality rate is double of global average in Sub-Saharan Africa . Latin America and Caribbean , Middle East and North Africa and South Asia also in the zone of higher adolescent mortality rate. However, the causes of adolescent mortality is different in different regions of the world. The main cause of adolescent death in Sub-Saharan Africa is infectious disease , while in North America and Caribbean and also in Middle East and North Africa , the main cause is interpersonal violence among adolescents.

Table: 2. Adolescent Mortality Rate at Global and Regional Level (Deaths per 1000 children aged 10)

	Adolescent Mortality Rate (2024)
Global Average	7
Regional Aggregates	
East Asia and Pacific	4
Europe and Central Asia	3
Latin America and Caribbean	6
Middle East and North Africa	6
North America	3
South Asia	6
Sub-Saharan Africa	14

Source: UNICEF Global database 2022

4.1.4. Anaemia in adolescent

Anaemia is a challenging health issue among adolescents. The overall adolescent anemia prevalence is 42 percent with female adolescents having 15 percent higher odds of anemia than males. The rate of prevalence is different in different regions of the world. It is a major health issue among adolescent girls and women of South Asia affecting 50 percent of adolescent girls and women. The region is not in the track of controlling anemia and achieving the target of SDG indicator 2.2.3 by 2030. It has been estimated that without proper action additional 18 million women and adolescents would be anemic by 2030 (UNICEF, 2025).

4.1.5. Food Insecurity in Adolescents

The adolescents belonging to households with low-income generation have to suffer food insecurity due to inadequate supply of their age-specific nutritious food. The older adolescents (15-18 years) are more likely to be food insecure than the younger adolescents (10-14 years) (Foss,2025). It is estimated in global studies that hunger among older adolescent is 30 percent and it is 25.5 percent in younger adolescents (11-14 years) (Fram et. al,2022). This hidden burden of food insecurity among adolescent is due to higher preference of mothers to younger adolescents, inadequate calorie and nutritional requirements to fulfill the demand of adolescents growing older. The lesser intake of fruits and vegetables and higher frequency of taking soft drinks, lack of adequate food at home results food insecurity among adolescents.

4.2. Nutritional Scenario of Adolescents in India

India is the home of largest adolescent population of the world with 253 million adolescents according to UNICEF India data. Out of 1.2 billion adolescents of the world -a fifth of these adolescents live in India (Sethi et. al,2019). The female adolescents constitute 47 percent of the total adolescent population in India. The figure below shows the growing trend of adolescent girls (10-



19 years age) in India from 1950 to 2025 . It was 35 million in 1950 which steadily increased to around 125 million in early 2020's. After a slight decline it reaches to 125 million in 2025 . There is overall a growing trend of adolescent girl population in the country over the period.

4.2.1. Malnutrition in Adolescents

The malnutrition among adolescents in the form of underweight or thinness, stunted growth and also overweight is a public health concern in India. The low weight for age (underweight) is higher among adolescent boys while low height for age (stunting) is higher among adolescent girls as compared to adolescent boys. The thinness is higher (23%) in early adolescent girls (10-14 years) than thinness (14%) in late adolescent (15-19 years) girls.

There is also coexistence of wasting and stunting among adolescent boys and girls. Around 50 percent short early adolescent girls are also underweight. However, the rate decreases slightly among late adolescent girls to 31 percent and 12 percent among adolescent boys of the age group 15-19 years. There is not much variation in the overweight rate among boys and girls. The overweight or obesity is highest (6%) among the girls aged 14 years and boys (7%) at 11 years (Sethi et. al,2019).

Table 2. Malnutrition among boys and girls of India

	10-14 Years		15-19 years		10-19 years	
	Girls	Boys	Girls	Boys	Girls	Boys
Underweight	23	32	14	26	18	29
Stunted	29	23	30	28	29	25
Overweight	5	5	4	4	5	5

Source: CNNS-Thematic-Report-Adolescents-Diets-and-Nutrition (2019)

4.2.2. Anaemia and Micronutrient deficiencies among adolescents

The anaemic adolescence loss their skills and productivity and being more susceptible to infectious diseases. Adolescent girls who enter pregnancy having anaemia may suffers a lot , the baby may born premature and below the standard weight of 2.5 kg. In India, there is an increasing trend of anaemia among adolescents (aged 15-19 years) from 54 percent during NFHS-4 to 59.2 percent in NFHS-5. The adolescent girls are more anaemic than adolescent boys. 59.1 percent adolescent girls were anaemic during 2029-2021, while it was 31.1 percent for adolescent boys during the same time period (NFHS-5). The chances of being anaemic is higher among older adolescent girls'(15-19 years) as compared to early adolescent (10-14 years) girls. The table below shows that 47.5 percent older adolescent girls are anaemic against 32.1 percent younger adolescents.

The iron deficiency among adolescent girls is also higher than boys. The deficiency of iron, even in the absence of anaemia negatively impacts physical, cognitive and emotional development (WHO,2010). It results impaired growth, low academic performance and higher complications in reproductive health of adolescent girls in future. The other important micronutrients like Vitamin B₁₂, Vitamin D, Vitamin A and Zinc deficiency during adolescence increases the risk of diseases in adulthood.

Table 3. Anaemia and Micronutrient Deficiencies among Indian Adolescents

	10-14 Years (%)		15-19 Years (%)		10-19 Years	
	Girls	Boys	Girls	Boys	Girls	Boys
Anaemia	32.1	17.1	47.5	18.1	40	18
Iron Deficiency	24	14	39	8	31	12
Vitamin B ₁₂ Deficiency	26	30	28	41	27	35
Folate Deficiency	36	36	32	44	34	39

Source: CNNS-Thematic-Report-Adolescents-Diets-and-Nutrition (2019)

5. ADOLESCENT HEALTH CARE STRUCTURE IN INDIA

Adolescents' access to preventative and promotional health care is greatly aided by Anganwadi Workers (AWWs), Auxiliary Nurse Midwives (ANMs), and Accredited Social Health Activists (ASHAs). They are responsible for health education, nutritional consultations, the provision of iron and folic acid tablets, growth monitoring, menstrual hygiene awareness, the referral of teenagers who are at risk, and community engagement to use existing health services. Through regular home visits and community events, these frontline workers also assist in the early detection of nutritional deficits and encourage healthy behavior in adolescents. An important turning point in the evolution of adolescent healthcare was the establishment of the Rashtriya Kishor Swasthya Karyakram (RKSK) in 2014. Unlike earlier programs that focused mainly on reproductive and sexual health, RKSK adopted a comprehensive approach to adolescent well-being by addressing six priority areas: nutrition, sexual and reproductive health, mental health, substance abuse, injuries and violence (including gender-based violence), and prevention of non-communicable diseases (MoHFW, 2014). In the clinics, qualified medical professionals provide age-appropriate advice and assist with referrals when specialized care is required (MoHFW, 2014). In India, adolescent health is greatly influenced by nutrition. The health system integrates nutritional



treatments through many programs, including POSHAN Abhiyaan, Anemia Mukht Bharat (AMB), and the Weekly Iron and Folic Acid Supplementation (WIFS) program. These programs aim to reduce anemia, promote nutrition education, enhance eating habits, and raise micronutrient intake among teenagers. Schools, Anganwadi Centers, and healthcare facilities provide iron and folic acid pills in addition to routine immunizations, nutrition counseling, and behavior change communication (MoHFW, 2018; Ministry of Women and Child Development).

Despite notable advancements in program implementation and policy formulation, adolescent healthcare delivery in India is still hampered by a number of issues. Lack of qualified healthcare workers, inadequate adolescent-friendly infrastructure, low awareness of available services, gender discrimination, sociocultural barriers, and geographic inaccessibility all contribute to a decline in healthcare utilization, especially in rural and marginalized communities (International Institute for Population Sciences [IIPS] & ICF, 2021).

6. RECOMMENDATIONS

Based on the available evidence, the following priorities can improve adolescent girls' nutrition in India:

- **Adopt a life-course approach:** Extend nutrition interventions from childhood through adolescence, pregnancy and motherhood.
- **Move beyond iron-only approaches:** Combine iron-folic acid supplementation with screening and management of other causes of anaemia.
- **Improve dietary diversity:** Promote affordable access to pulses, vegetables, fruits, dairy, eggs, nuts, seeds, animal-source foods and fortified foods.
- **Strengthen school and community platforms:** Reach both school-going and out-of-school girls, particularly those from disadvantaged households.
- **Address gender inequality:** Ensure girls have greater access to food, resources, healthcare and nutrition information.
- **Integrate nutrition with menstrual health:** Link anaemia prevention with menstrual education, menstrual products, WASH facilities and appropriate screening.
- **Improve adolescent-friendly health services:** Provide accessible counselling, screening, supplementation and referral services.
- **Address unhealthy food environments:** Prevent undernutrition while reducing exposure to unhealthy foods and beverages.
- **Strengthen local evidence:** Use district-level data to identify high-risk groups and guide targeted interventions.

7. CONCLUSION

Adolescent girls' nutrition is a critical but often underprioritized public health concern. In India, undernutrition, anaemia and micronutrient deficiencies coexist with emerging overweight and obesity, influenced by socioeconomic, dietary, gender, menstrual, WASH and healthcare factors. A comprehensive, gender-responsive approach integrating nutrition, menstrual health, education, infection control and adolescent-friendly services is therefore essential. Investing in adolescent girls' nutrition can improve health, education, productivity, gender equity and the well-being of future generations.

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