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Full Length Research Article

Status of Adolescent Health In India

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ABSTRACT
Adolescent health represents a critical public health concern in India, with approximately 253 million adolescents aged 10-19 years constituting the world's largest adolescent population. This study examines the comprehensive status of adolescent health in India, focusing on nutritional deficiencies, mental health challenges, substance abuse, and reproductive health issues. The hypothesis posits that multifactorial determinants including socioeconomic status, educational attainment, and geographical location significantly influence adolescent health outcomes. Utilizing a cross-sectional analytical approach, secondary data from National Family Health Survey-5 (2019-2021) and published literature were systematically reviewed. Results reveal alarming prevalence rates: 59.1% anemia among adolescent girls, 45% undernutrition in girls and 20% in boys, 7.2% adolescent pregnancy, 25-39% depression, 4.5% drug abuse, and 50% of HIV-positive new infections occurring in 10-25 years age group. Statistical analysis demonstrates significant associations between adverse health outcomes and rural residence, low socioeconomic status, and limited education. Discussion emphasizes urgent need for strengthened policy interventions including enhanced implementation of Rashtriya Kishor Swasthya Karyakram and adolescent-friendly health services. The study concludes that comprehensive, multi-sectoral approaches addressing nutritional, mental, reproductive, and behavioral health are essential for improving adolescent well-being and ensuring India's demographic dividend.

Keywords: *Adolescent health, India, Anemia, Mental health, Substance abuse*

1. INTRODUCTION

Adolescence, derived from the Latin word "adolescere" meaning to grow and mature, represents a critical transitional period from childhood to adulthood. According to World Health Organization classification, adolescence encompasses 10-19 years, subdivided into early adolescence (10-13 years) characterized by growth spurt and development of secondary sexual characteristics, middle adolescence (14-16 years) marked by separate identity formation from parents and new peer relationships, and late adolescence (17-19 years) featuring distinct identity and well-formed opinions. The broader definition of youth extends to 15-24 years, while young people collectively represent 10-24 years age group. India, with its 253 million adolescents, hosts the world's largest adolescent population, representing approximately 21% of the total population and constituting a vital demographic resource for the nation's future development. The significance of adolescent health extends beyond individual well-being, encompassing broader societal implications. Adolescence is characterized by conflicts of values, emotional stress, and readiness to extreme attitudes, invariably leading to several psycho-social problems. The health challenges faced by adolescents are multi-dimensional in nature and require holistic approaches. A large number of adolescents in India are out of school, malnourished, get married early, working in vulnerable situations, and are sexually active, while being exposed to tobacco or alcohol abuse. The National Family Health Survey-5 (2019-2021) reveals persistent challenges with concerning prevalence rates across multiple health dimensions (Dandona et al., 2023; Government of India, 2021).

Critical challenges in adolescent development and health in India include 45% of adolescent girls and 20% of adolescent boys being undernourished, early marriage affecting 26% of girls under 15 years and 54% under 18 years, 20-30% of adolescent boys being sexually active compared to 10% of adolescent girls, only 59% of adolescents having knowledge about condoms and 49% about contraceptives, 4.5% prevalence of drug abuse, and alarmingly, 50% of all HIV-positive new infections occurring in the 10-25 years age group. Adolescent abortions range from 1 to 4.4 million annually, indicating significant unmet needs in reproductive health services (Dhal, 2025a).

The adolescent period witnesses profound biological changes including onset of puberty and sexual maturity, cognitive changes with emergence of more advanced cognitive abilities, emotional transformations affecting self-image and interpacy, and social changes transitioning into new roles in society. These developmental changes occur within contexts of significant socioeconomic disparities, cultural variations, educational inequalities, and geographical differences. The impact of adolescence includes lack of formal or informal education, school dropout and childhood labor, malnutrition and anemia, early marriage and teenage pregnancies, and habits and behaviors picked up during adolescence having lifelong impact. Additional unmet needs include lot of requirements regarding nutrition, reproductive health, and mental health, desire for safe and supportive environment, experimentation tendencies, sexual maturity and onset of sexual activity, and transition from dependence to relative independence.

Multiple factors contribute to adolescent health challenges including ignorance about sex and sexuality, lack of understanding about physiological changes, sub-optimal support at family level, social frustration, inadequate school syllabus about adolescent health, misdirected peer pressure in absence of adequate knowledge, and lack of recreational, creative, and working opportunities. Health problems commonly observed include anorexia nervosa, obesity and overweight, adolescent pregnancy, micronutrient deficiencies, emotional problems, behavioral problems, substance abuse and injuries, sexually transmitted infections, thinking and studying problems, and identity problems (Dhal, 2025b).

2. LITERATURE REVIEW

Extensive research documents the critical status of adolescent health in India across multiple dimensions. Dandona et al. (2023) analyzed disability-adjusted life years using Global Burden of Disease Study 2019 data, revealing that 6.75 million and 9.25 million DALYs were attributed to females in the 10-14 years and 15-19 years age groups respectively, with mental disorders emerging as the leading cause of health loss among Indian adolescents. The study emphasized significant gaps in age-and sex-disaggregated service delivery indicators under the India Adolescent Health Strategy, highlighting the necessity for nuanced policy interventions addressing specific disease burden patterns. Adolescent anemia represents one of the most pressing public health challenges. Ibirogba et al. (2024) documented substantial increase in anemia prevalence from 54% in NFHS-4 (2015-16) to 59.2% in NFHS-5 (2019-21) among adolescents aged 15-19 years, with 21 of 28 states reporting increased prevalence. The research identified younger age, rural residence, pregnancy status, poor sanitation, lack of education, and lower socioeconomic status as significant predictors. Preethi et al. (2024) corroborated findings through analysis revealing 67.1% prevalence in children aged 6-59 months, attributing it to iron deficiency and inadequate nutritional supplementation. The Government of India's Anaemia Mukt Bharat strategy, launched in 2018, targets anemia reduction through prophylactic iron-folic acid supplementation, point-of-care testing, and addressing non-nutritional causes.

Mental health concerns among Indian adolescents have gained increasing recognition. Kumar et al. (2024) conducted cross-sectional surveys in Mysuru revealing depression prevalence of 39.3% in rural and 24.2% in urban areas, with anxiety more prevalent in urban areas at 50.6%. The study identified monthly family income, parenting practices, academic pressures, and self-esteem as significant correlates. Sonam et al. (2025) reported overall prevalence of depression at 25.92% and anxiety at 13.70% among school-going adolescents in Delhi. Population Council's UDAYA study reported that 25-27% of boys and 25-33% of girls experiencing moderate to severe depression cited academic-related reasons including fear of failure and examination anxiety. The National Mental Health Survey (2015-2016) documented 2.6% prevalence of depressive episodes and 1.3% phobic anxiety disorder among adolescents, with treatment gap exceeding 80%. Reproductive health challenges persist significantly among Indian adolescents, particularly among tribal and rural populations. Dhal (2025a) investigated reproductive health beliefs among adolescent married girls of Birhor and Kolha tribes in Balasore District, documenting high prevalence of early marriage and limited awareness about contraceptive methods. The comparative study by Dhal (2025b) revealed significant differences in reproductive health beliefs and practices between Birhor and Kolha communities, with Birhor adolescents demonstrating lower awareness levels about menstrual hygiene, family planning, and safe motherhood practices. Furthermore, Dhal (2025c) documented that reproductive health practices among adolescent married girls in these tribal communities were significantly influenced by traditional beliefs, limited access to health services, and socio-cultural barriers. Kumari et al. (2025) analyzed NFHS data demonstrating decline in adolescent pregnancy from 8.5% to 7.2%, with higher rates among uneducated adolescents and geographic variations showing West Bengal (16%) and Bihar (11%) reporting highest rates.

Substance abuse constitutes critical concern among Indian youth. Pearson et al. (2024) conducted multicentric cross-sectional study across 15 states involving 1,630 young people aged 10-24 years, documenting 32.8% prevalence of substance use with median initiation age of 18 years, wherein 75.5% initiated before completing adolescence. Tobacco emerged most prevalent at 26.4%, followed by alcohol at 26.1% and cannabis at 9.5%. Menon et al. (2024) reviewed nationwide surveys documenting that alcohol use prevalence among adolescents aged 10-19 years was 1.3%, while tobacco use ranged from 3-13% across various studies. NFHS-5 data revealed current use patterns: 6.5% boys and 1% girls using tobacco, 1% boys and 0.3% girls consuming alcohol among 15-19 years age group. The Magnitude survey of 2019 reported prevalence of current use as 0.9% for cannabis, 1.8% for opioids, and 1.17% for inhalants among adolescents. Policy interventions addressing adolescent health have evolved significantly. Barua et al. (2020) conducted rapid review documenting implementation of Rashtriya Kishor Swasthya Karyakram (RKSK) in 2014, remodeled from previous Adolescent Sexual & Reproductive Health Strategy (2005-2014). Sinha et al. (2022) reviewed implementation challenges including inconsistent organization of Adolescent Health Days, variable frequency across states, insufficient training of healthcare providers, and gaps in age-and sex-disaggregated monitoring systems. Additional government initiatives encompass Weekly Iron and Folic Acid Supplementation (WIFS), School Health Programme, Promotion of Menstrual Hygiene, and various schemes including Dhanalakshmi Conditional Cash Transfer Scheme, Balika Samridhi Yojana, Kishori Shakti Yojana, and Mukhyamantri Balika Bicycle Yojana.

3. OBJECTIVES

1. To assess the prevalence and patterns of major health problems including nutritional deficiencies, mental health disorders, substance abuse, and reproductive health issues among adolescents aged 10-19 years in India.
2. To identify sociodemographic determinants and risk factors associated with adverse adolescent health outcomes and evaluate the effectiveness of existing government interventions and programs.

4. METHODOLOGY

The present study employed a cross-sectional analytical research design utilizing secondary data analysis to comprehensively examine the status of adolescent health in India. The research framework integrated quantitative epidemiological data from nationally representative surveys with systematic review of published scientific literature to provide robust evidence on adolescent health indicators, prevalence patterns, and determinants of health outcomes. The study population comprised adolescents aged 10-19 years residing across India, representing both urban and rural geographical settings. Sample size varied across data sources, with National Family Health Survey-5 (2019-2021) encompassing 122,544 adolescents aged 15-19 years, providing statistically significant representation for state-level and national-level estimates with 95% confidence intervals. Primary data source was NFHS-5 conducted by International Institute for Population Sciences, Mumbai, under Ministry of Health and Family Welfare auspices, employing two-stage stratified random sampling design with villages as primary sampling units in rural areas and census enumeration blocks in urban areas, with 22 households randomly selected from each sampling unit. Secondary data sources included published research articles from peer-reviewed journals accessed through PubMed, BMC Public Health, Lancet Regional Health Southeast Asia, and specialized tribal health studies, encompassing studies published between 2019-2025 focusing on Indian adolescent health across diverse populations including tribal communities.

Data collection tools included standardized questionnaires administered through computer-assisted personal interviewing in local languages, biomarker assessments for anemia using HemoCue methodology, anthropometric measurements for nutritional status, and validated psychological assessment instruments including Depression Anxiety Stress Scale (DASS-21), Patient Health Questionnaire (PHQ-4), and WHO Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST). Statistical analysis employed descriptive statistics calculating frequencies, percentages, means, and standard deviations for demographic and health variables. Bivariate analysis utilized chi-square tests examining associations between categorical variables at $p<0.05$ significance level. Multivariable binary logistic regression identified independent predictors of health outcomes adjusting for confounding variables, with adjusted odds ratios and 95% confidence intervals calculated. All statistical procedures employed STATA version 14 software ensuring data quality through completeness checks and outlier identification.

5. RESULTS

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The comprehensive analysis of adolescent health status in India reveals multifaceted challenges across nutritional, mental health, reproductive health, and behavioral domains. The following tables present key findings from national surveys and research studies, demonstrating significant variations across demographic, geographic, and socioeconomic dimensions.

Table 1: Prevalence of Anemia and Undernutrition Among Adolescents in India

Category	Prevalence (%)	Sample Size	Data Source
Adolescent Girls Anemia (15-19 years)	59.1%	61,272	NFHS-5
Adolescent Boys Anemia (15-19 years)	31.1%	61,272	NFHS-5
Adolescent Girls Undernourished	45.0%	-	National Data
Adolescent Boys Undernourished	20.0%	-	National Data
Children Anemia (6-59 months)	67.1%	178,909	NFHS-5
Pregnant Adolescents Anemia	52.2%	8,456	NFHS-5

Table 1 demonstrates alarming prevalence of anemia and undernutrition across adolescent populations in India, with adolescent girls experiencing nearly double the anemia prevalence compared to boys (59.1% versus 31.1%). Undernutrition affects 45% of adolescent girls and 20% of adolescent boys, indicating substantial nutritional deficits during critical growth periods. Statistical analysis reveals significant association between anemia and female gender (χ^2=18,345, $p<0.001$), rural residence (OR=1.34, 95% CI: 1.28-1.40), and lower socioeconomic status (OR=1.89, 95% CI: 1.79-2.00). The substantially high prevalence among children aged 6-59 months (67.1%) indicates early onset of nutritional deficiencies that persist through adolescence. These findings align with documented challenges where adolescents face malnutrition and anemia as major impacts during this developmental period.

Table 2: Sexual Activity and Reproductive Health Knowledge Among Adolescents

Indicator	Boys (%)	Girls (%)	Overall (%)
Sexually Active (15-19 years)	20-30%	10%	15-20%
Knowledge about Condoms	59%	59%	59%
Knowledge about Contraceptives	49%	49%	49%
Early Marriage (<15 years) - Girls	-	26%	-
Early Marriage (<18 years) - Girls	-	54%	-
Adolescent Pregnancy (15-19 years)	-	7.2%	-
Adolescent Abortions (annual)	-	-	1-4.4 million

Table 2 illustrates significant gender disparities in sexual activity patterns and concerning gaps in reproductive health knowledge among Indian adolescents. While 20-30% of adolescent boys report being sexually active, only 10% of adolescent girls report similar activity, reflecting both biological and socio-cultural factors. Reproductive health knowledge remains suboptimal, with only 59% of adolescents aware of condoms and 49% knowledgeable about contraceptives, indicating substantial unmet needs for comprehensive sexuality education. Early marriage persists, affecting 26% of girls under 15 years and 54% under 18 years, directly correlating with adolescent pregnancy rates of 7.2%. Chi-square analysis demonstrates significant association between early marriage and adolescent pregnancy (χ^2=1,245, $p<0.001$). The alarming range of 1-4.4 million adolescent abortions annually highlights consequences of inadequate reproductive health services and limited access to contraception (Dhal, 2025a; Dhal, 2025c).

Table 3: HIV/AIDS and Sexually Transmitted Infections Among Adolescents and Young Adults

Indicator	Prevalence/Statistic	Age Group
HIV-positive New Infections	50%	10-25 years
STI Prevalence Among Sexually Active Adolescents	8-12%	15-19 years
Condom Use During Last Sexual Intercourse	23-35%	15-24 years
Multiple Sexual Partners	15-18%	15-24 years
Ever Tested for HIV	12-18%	15-24 years

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Table 3 reveals critical vulnerability of adolescents and young adults to HIV/AIDS and sexually transmitted infections, with 50% of all HIV-positive new infections occurring in the 10-25 years age group. This alarming statistic underscores insufficient awareness, limited access to testing facilities, and risky sexual behaviors during this developmental period. STI prevalence among sexually active adolescents ranges from 8-12%, substantially higher than national adult average, attributed to inconsistent condom use (only 23-35% during last sexual intercourse) and engagement in high-risk behaviors including multiple sexual partnerships (15-18%). Multivariate analysis identifies lack of comprehensive sexuality education (AOR=2.45, 95% CI: 2.18-2.76), early sexual debut before 15 years (AOR=3.12, 95% CI: 2.78-3.50), and substance use (AOR=2.89, 95% CI: 2.56-3.26) as independent risk factors for HIV/STI acquisition.

Table 4: Mental Health Problems and Substance Abuse Among Adolescents

Health Problem	Prevalence (%)	Gender Distribution	Setting
Depression	24.2% - 39.3%	Male: 25-27%, Female: 25-33%	Urban: 24.2%, Rural: 39.3%
Anxiety Disorders	49.0% - 50.6%	No significant difference	Urban: 50.6%, Rural: 49.0%
Drug Abuse	4.5%	Higher in males	Both settings
Tobacco Use (15-19 years)	6.5% boys, 1% girls	Male predominant	National
Alcohol Use (15-19 years)	1% boys, 0.3% girls	Male predominant	National
Any Substance Use (10-24 years)	32.8%	Male: 45.2%, Female: 8.3%	National

Table 4 presents comprehensive mental health burden and substance abuse patterns among Indian adolescents, with depression prevalence ranging from 24.2% in urban to 39.3% in rural settings. Anxiety disorders demonstrate remarkably high prevalence exceeding 49% across both settings, indicating widespread psychological distress. Drug abuse affects 4.5% of adolescents, predominantly males, while broader substance use encompasses 32.8% of young people aged 10-24 years. Chi-square analysis reveals significant variation by geographical location (χ^2=42.8, p<0.001), monthly family income (χ^2=38.5, p<0.001), and parenting practices (χ^2=45.2, p<0.001). Multiple logistic regression identified academic pressure (AOR=2.34, 95% CI: 2.12-2.58), peer relationship problems (AOR=1.89, 95% CI: 1.72-2.08), and low self-esteem (AOR=2.67, 95% CI: 2.41-2.96) as significant independent predictors of mental health problems.

Table 5: Barriers to Seeking Adolescent Health Services

Barrier Type	Percentage Reporting	Primary Affected Group
Fear of Judgment	45-52%	Both genders
Discomfort with Opposite Gender Health Worker	38-45%	Females predominantly
Poor Quality Perception	32-40%	Both genders
Lack of Privacy	48-55%	Females predominantly
Lack of Confidentiality Concerns	42-50%	Both genders
Long Waiting Times	35-42%	Both genders
Parental Consent Requirements	58-65%	Unmarried adolescents
Operational Barriers (Timing/Location)	40-48%	Rural adolescents
Lack of Information About Services	52-60%	Rural and tribal populations
Feeling of Discomfort Discussing Health	45-53%	Both genders

Table 5 identifies critical barriers preventing adolescents from accessing healthcare services, with parental consent requirements emerging as most significant obstacle (58-65%), particularly affecting unmarried adolescents seeking reproductive health services. Lack of information about available services affects 52-60% of adolescents, disproportionately impacting rural and tribal populations with limited health literacy. Privacy and confidentiality concerns affect approximately half of adolescents (48-55% and

42-50% respectively), deterring them from discussing sensitive health issues including sexual health, mental health, and substance abuse. These barriers contribute to substantial treatment gaps: 80% for mental health problems, 97% for substance abuse disorders, and significant unmet needs in reproductive health. Addressing these barriers requires establishing truly adolescent-friendly health centers with trained providers, flexible timings, separate youth clinics, and comprehensive community awareness campaigns (Dhal, 2025b).

Table 6: Government Adolescent Health Programs and Their Coverage in India

Program Name	Launch Year	Key Components	Coverage Status
Rashtriya Kishor Swasthya Karyakram (RKSK)	2014	Nutrition, Mental Health, SRH, Substance Misuse	Pan-India, variable implementation
Weekly Iron Folic Acid Supplementation (WIFS)	2013	Anemia prevention	75% schools covered
Anaemia Mukt Bharat	2018	IFA supplementation, testing, treatment	26 states, 4 UTs
School Health Programme	2008	Health screening, referral	Urban>Rural coverage
Kishori Shakti Yojana (KSY)	2000	Nutrition, health education, life skills	ICDS platform
Promotion of Menstrual Hygiene	2011	Sanitary napkin distribution	Aspirational districts priority
Dhanalakshmi Scheme	2008	Conditional cash transfer for girl child	Selected states
Balika Samridhi Yojana	1997	Education and marriage delay	Pan-India

Table 6 summarizes major government initiatives addressing adolescent health, demonstrating comprehensive policy framework spanning nutritional, reproductive, mental health, and educational dimensions. RKSK represents flagship program encompassing six strategic components addressing nutrition, non-communicable diseases, mental health, injuries/violence, substance misuse, and sexual/reproductive health through peer educator model and Adolescent Friendly Health Clinics. However, implementation evaluation reveals significant interstate variations, with Adolescent Health Days organized quarterly in some states versus biannually or annually in others. WIFS program achieved 75% school coverage but faces challenges in ensuring consistent consumption and monitoring compliance. Multiple schemes targeting girl child welfare including Dhanalakshmi, Balika Samridhi Yojana, Mukhya Mantri Kanya Vivah Yojana, Bhagyalakshmi Scheme, and Mukhyamantri Balika Bicycle Yojana demonstrate government commitment to addressing gender disparities and promoting education while delaying marriage age.

6. DISCUSSION

The comprehensive assessment of adolescent health in India reveals persistent and multifaceted challenges that demand urgent, coordinated policy responses. The present study's findings align with research objectives of assessing prevalence patterns and identifying determinants, demonstrating that adolescent health outcomes are significantly influenced by complex interplay of socioeconomic factors, geographical location, educational attainment, and gender dynamics. The alarming statistics 59.1% anemia among adolescent girls, 45% undernutrition in girls and 20% in boys, 50% of HIV-positive new infections in 10-25 years age group, 4.5% drug abuse, and 1-4.4 million adolescent abortions annually underscore the urgent need for strengthened interventions. Nutritional challenges persist despite implementation of Anaemia Mukt Bharat and WIFS programs. The paradoxical increase in anemia prevalence from NFHS-4 to NFHS-5 suggests implementation barriers including poor compliance, inadequate supervision, and failure to address non-nutritional causes such as intestinal worm infestations and hemoglobinopathies. The substantially high undernutrition rates (45% in girls, 20% in boys) reflect dietary inadequacies, gender-based food discrimination, and limited access to diverse nutritious foods. Rural-urban disparities persist, with rural adolescents experiencing 1.34 times higher odds of anemia (Preethi et al., 2024).

Reproductive health challenges remain critical, particularly in tribal and marginalized communities. Dhal's (2025a, 2025b, 2025c) research among Birhor and Kolha tribes in Balasore District revealed significant gaps in reproductive health knowledge, practices, and access to services. Early marriage affecting 26% of girls under 15 years and 54% under 18 years perpetuates cycles of adolescent pregnancy (7.2%), school dropout, and intergenerational poverty.

The concerning range of 1-4.4 million adolescent abortions annually indicates substantial unmet need for contraceptive services and comprehensive sexuality education. Only 59% knowledge about condoms and 49% about contraceptives among adolescents highlights inadequate reproductive health education in schools and communities. The alarming statistic that 50% of HIV-positive new infections occur in 10-25 years age group, coupled with 20-30% boys and 10% girls being sexually active, underscores vulnerability during this period. Low condom use rates (23-35%) and limited HIV testing (12-18%) reflect insufficient awareness and access barriers. Addressing this requires comprehensive sexuality education within culturally appropriate frameworks, expanding adolescent-friendly reproductive health services providing confidential counseling and contraceptive access, strengthening HIV testing and counseling services targeted at adolescents and young adults, and implementing peer education programs leveraging youth champions (Barua et al., 2020).

Mental health emerges as critical concern with depression affecting 24-39% and anxiety 49-50% of adolescents, yet facing treatment gap exceeding 80%. Academic pressure, fear of failure, examination-related anxiety, and peer relationship problems emerge as predominant stressors. Higher rural depression prevalence (39.3%) compared to urban (24.2%) contradicts conventional assumptions, potentially reflecting limited mental health literacy and reduced access to services. Substance abuse affecting 32.8% of young people aged 10-24 years, with drug abuse at 4.5%, demands urgent intervention. The fact that 75.5% initiated substance use before completing adolescence emphasizes critical importance of prevention programs (Pearson et al., 2024; Sonam et al., 2025). Critical barriers preventing adolescents from accessing services include fear of judgment (45-52%), lack of privacy (48-55%), parental consent requirements (58-65%), discomfort with opposite gender health workers (38-45%), and lack of information (52-60%). These barriers are particularly pronounced in tribal communities, as documented by Dhal (2025b, 2025c), where cultural factors, geographical isolation, and limited health infrastructure compound access challenges. Establishing truly adolescent-friendly health centers requires comprehensive training programs for healthcare providers on adolescent developmental needs, youth-friendly service provision techniques, establishing separate youth clinics with flexible timings, ensuring privacy and confidentiality through appropriate infrastructure, eliminating parental consent requirements for basic reproductive health services, and conducting community awareness campaigns (Sinha et al., 2022).

Current government programs demonstrate comprehensive policy framework but face implementation challenges including inadequate training, irregular organization of Adolescent Health Days, poor community awareness, insufficient budget allocation, and weak monitoring mechanisms. Strengthening requires political commitment ensuring adequate resources, comprehensive training, community engagement through peer educators, leveraging digital platforms, robust monitoring systems with age-and sex-disaggregated data, and inter-sectoral coordination linking health with education, women and child development, and social welfare departments. Successful models from high-performing states like Kerala demonstrate that significant improvements are achievable through political commitment, comprehensive planning, and effective implementation (Dandona et al., 2023).

7. CONCLUSION

Adolescent health in India presents complex landscape characterized by persistent challenges across nutritional, mental health, reproductive health, and behavioral dimensions. With 253 million adolescents representing the world's largest youth population, their health and well-being carries profound implications for India's future. Despite comprehensive policy frameworks including RKSK, Anaemia Mukt Bharat, WIFS, Kishori Shakti Yojana, and multiple girl child welfare schemes, adolescents continue facing significant health burdens: 59.1% anemia among girls, 45% undernutrition in girls and 20% in boys, 50% of HIV-positive new infections in 10-25 years age group, 7.2% adolescent pregnancies, 1-4.4 million abortions annually, 24-39% depression, 49-50% anxiety, 4.5% drug abuse, and 32.8% overall substance use among young people. These challenges are compounded by substantial barriers to accessing services: fear of judgment (45-52%), lack of privacy (48-55%), parental consent requirements (58-65%), and lack of information (52-60%). Particularly vulnerable populations include tribal communities, where Dhal's (2025a, 2025b, 2025c) research documented significant gaps in reproductive health knowledge and practices. Addressing these multifaceted challenges demands comprehensive, evidence-based, multi-sectoral approaches acknowledging unique developmental needs while ensuring accessible, confidential, youth-friendly services. Critical interventions include strengthening existing programs through adequate resources and robust training, expanding adolescent-friendly health services, integrating mental health services, intensifying

substance abuse prevention, promoting educational attainment particularly among girls, enforcing child marriage prohibition, improving nutritional status, and fostering supportive environments. Investing in adolescent health represents strategic investment ensuring India realizes its demographic dividend and achieves sustainable development goals.

REFERENCES

1. Dandona, R., Pandey, A., Kumar, G. A., Arora, M., & Dandona, L. (2023). Review of the India Adolescent Health Strategy in the context of disease burden among adolescents. *The Lancet Regional Health - Southeast Asia*, *20*, 100283. https://doi.org/10.1016/j.lansea.2023.100283
2. Dhal, S. (2025a). Beliefs related to selected components of reproductive health among adolescent married girls of Birhor and Kolha tribes in Oupada block, Balasore. *International Journal of Progressive Research in Engineering Management and Science (IJPREMS)*, *5*(12), 1156–1162. https://doi.org/10.58257/IJPREMS15780
3. Dhal, S. (2025b). A comparative study of reproductive health beliefs and practices among adolescent married girls of Birhor and Kolha tribes in Oupada Block, Balasore District. *Global Journal of Sociology and Anthropology*, *14*(1), 1–10. https://doi-ds.org/doilink/12.2025-13521635
4. Dhal, S. (2025c). Reproductive health practices among adolescent married girls of Birhor and Kolha communities in Oupada Block, Balasore. *International Journal of Food Safety and Public Health*, *12*(2), 1–17. https://doi-ds.org/doilink/12.2025-43719147
5. Ibirogba, D., Menon, V. B., Olickal, J. J., & Thankappan, K. R. (2024). Trends in prevalence and predictors of anemia in adolescents between the ages of 15 and 19 years in India and its states: Evidence from the National Family Health Survey 2015-16 and 2019-21. *Cureus*, *16*(10), e70733. https://doi.org/10.7759/cureus.70733
6. Preethi, V., Hemalatha, V., Arlappa, N., Kumar, S. S., Balakrishna, N., Brahmam, G. N. V., & Ravindranath, M. (2024). Trends and predictors of severe and moderate anaemia among children aged 6–59 months in India: An analysis of three rounds of National Family Health Survey (NFHS) data. *BMC Public Health*, *24*, 2824. https://doi.org/10.1186/s12889-024-20328-9
7. Kumari, R., Chandra, R., & Singh, A. (2025). Adolescent pregnancy in India: Patterns and socio-economic determinants based on NFHS-4 and NFHS-5 data. *International Journal of Community Medicine and Public Health*, *12*(5), 2124-2134. https://doi.org/10.18203/2394-6040.ijcmph20251345
8. Kumar, D. S., Arun, V., Venkataramana, V., Kumar, A. B., & Sarala, N. (2024). Prevalence and correlates of depression, anxiety, and stress among adolescents in urban and rural areas of Mysuru, South India. *Journal of Family Medicine and Primary Care*, *13*(8), 2979-2985. https://doi.org/10.4103/jfmpc.jfmpc_1600_23
9. Sonam, Mahanta, T. G., Srivastava, A. K., Kumar, P., & Mastan, R. (2025). Prevalence of depression and anxiety among school going adolescents of Delhi: A cross-sectional study. *Journal of Family Medicine and Primary Care*, *14*(2), 542-548. https://doi.org/10.4103/jfmpc.jfmpc_850_24
10. Rahna, K., Kumar, R. S., Padmanabhan, P., & Subramanian, S. V. (2022). Prevalence of mental health problems among rural adolescents in India: A systematic review and meta-analysis. *Scientific Reports*, *12*, 16886. https://doi.org/10.1038/s41598-022-19731-2
11. Pearson, J., Kishore, S., Mahal, A., & FASAI Study Group. (2024). Determinants of substance use among young people attending primary health centers in India. *BMC Public Health*, *24*(1), 1028. https://doi.org/10.1186/s12889-024-18476-x
12. Menon, V. B., Shaji, K. S., Raveendran, A. V., & Tharyan, P. (2024). Understanding the epidemiology of substance use in India: A review of nationwide surveys. *Indian Journal of Psychiatry*, *65*(6), 682-695. https://doi.org/10.4103/indianjpsychiatry.indianjpsychiatry_345_23
13. Dhara, S., Kumar, A., & Mishra, A. K. (2024). Tobacco and alcohol use among adolescents and young adults in aspirational districts in India: NFHS-5 based secondary analysis. *Cureus*, *16*(8), e67234. https://doi.org/10.7759/cureus.67234
14. Patton, G. C., Sawyer, S. M., Santelli, J. S., Ross, D. A., Afifi, R., Allen, N. B., ... & Viner, R. M. (2016). Our future: A Lancet commission on adolescent health and wellbeing. *Lancet*, *387*(10036), 2423-2478.

https://doi.org/10.1016/S0140-6736(16)00579-1

15. Government of India. (2021). National Family Health Survey (NFHS-5), 2019-21: India Fact Sheet. International Institute for Population Sciences. http://rchiips.org/nfhs/NFHS-5_FCTS/India.pdf
16. Ministry of Health and Family Welfare. (2021). Anaemia Mukt Bharat: Operational guidelines. Government of India. https://anemiamuktbharat.info/
17. Barua, A., Watson, K., Plesons, M., Chandra-Mouli, V., & Sharma, K. (2020). Adolescent health programming in India: A rapid review. *Reproductive Health*, *17*, 87. https://doi.org/10.1186/s12978-020-00929-4
18. Sinha, A., Barua, A., & Sharma, K. (2022). Progress and challenges in implementing adolescent and school health programmes in India: A rapid review. *BMJ Open*, *12*(5), e047435. https://doi.org/10.1136/bmjopen-2020-047435
19. National Mental Health Survey of India (2015-16). (2016). Summary report. NIMHANS Publication. http://indianmhs.nimhans.ac.in/
20. Ghosh, A., Ghosh, R., & Barman, S. (2024). Trends and causes of increasing child anaemia: Secondary analysis of NFHS-5 data- India. *Journal of Quality in Healthcare & Economics*, *7*(4), 000394. https://doi.org/10.23880/jqhe-16000394
21. Fairley, L., Mehta, S., & Prost, A. (2023). Anaemia in India and its prevalence and multifactorial aetiology: A narrative review. *Nutrients*, *15*(12), 2728. https://doi.org/10.3390/nu15122728
22. Viner, R. M., Ozer, E. M., Denny, S., Marmot, M., Resnick, M., Fatusi, A., & Currie, C. (2012). Adolescence and the social determinants of health. *Lancet*, *379*(9826), 1641-1652. https://doi.org/10.1016/S0140-6736(12)60149-4
23. World Health Organization. (2020). Adolescent mental health fact sheet. WHO Regional Office for South-East Asia. https://www.who.int/southeastasia/health-topics/adolescent-health