International Journal of Environmental Sciences
ISSN: 2229-7359
Vol. 10 No. 4, 2024
https://www.theaspd.com/ijes.php

The Status Of Anemia Among Adolescent Girls In Haryana

Ruby[1], Anil[2], Dr. Lalit Sharma[3]
[1,2]Research Scholars, Department of Economics, Guru Jambheshwar University of Science & Technology, Hisar (125001), Haryana
[3]Assistant Professor, Department of Economics, Guru Jambheshwar University of Science & Technology, Hisar (125001), Haryana
Email: [1]rubynehra9@gmail.com, [2]eco1921anil@kuk.ac.in and [3]lalitsharma.1@gjust.org

Abstract: *Anemia is a serious nutritional health issue in developing nations such as India, owing to poor eating habits and malnutrition. Anemia is a critical public health concern with multifaceted implications for individual health and societal development among adolescent girls. Adolescence is a particularly sensitive stage in the human life cycle for the development of dietary anemia. This study explores the status of anemia among adolescent girls (15-19 years) in various districts of Haryana. The present attempt is based on the Demographic Health Survey data from the 4th and 5th editions of the National Family Health Survey. Panipat had the highest anemia, and Rohtak had the lowest anemia among adolescent girls based on NFHS-4. Gurgaon had the highest, and Jind had the lowest anemia among girls based on NFHS-5.*
Keywords: *Anemia, adolescent girls*

1. INTRODUCTION

Haryana is one of the well-off states of India and its per capita income is more than the national per capita income. But, when we talk about social issues like sex ratio, and child and women nutrition, we find Haryana's performance unsatisfactory (Hooda et al., 2017; Hassan et al.; Devender & Kumar, 2022). National Family Health Survey showed that anemia is a key public health challenge in India, mainly for women and children. NFHS-5 carries the depressing message from the population suffering due to anemia that 67% of the children and 57% of women are suffering due to lack of nutritious food. NFHS-5 indicates that the percentage of anemia has increased among women and children compared to the previous NFHS-4 edition. In the case of all women in reproductive age, it shows 3.9 percentage points; among adolescent women, 5 percentage points; and among adolescent girls aged 15 to 19 years, 59% of them were found to be anemic. Adolescent girls' anemia is a crucial public health issue in Haryana. Adolescence is defined as a time of life between the ages of 10 and 19 years. During this foundational era of life, individuals experience significant physical, behavioral and psychological changes. Adolescence is a particularly sensitive stage in the human life cycle for the development of dietary anemia. The word "anemia" derives from an ancient Greek word "*anaimia"* meaning "lack of blood". When the amount of hemoglobin in red blood cells is lower than normal or when there are fewer red blood cells than typical, anemia results. Hemoglobin is necessary for the blood to transfer oxygen to the body's tissues; if a person has too few red blood cells or not enough hemoglobin, the capability of blood to transfer oxygen would be diminished.

Adolescence in girls has been acknowledged as a time of conversion from girlhood to womanhood. Adolescents, particularly girls, are more sensitive to anemia due to increased demand during a growth spurt, poor food consumption, susceptibility to helminthic infection, and increased iron and blood loss during menstruation. Iron deficiency is considered to cause 50% of anemia in women worldwide. Infections and other dietary deficits are significant global causes of anemia, particularly vitamin B12, vitamin C, and folate, as well as hereditary disorders, persistent inflammation, and an inherited blood disease. Severe malaria frequently causes anemia, possibly linked to a subsequent bacterial infection. Pregnant adolescents are especially susceptible to anemia due to their increased iron needs for both personal growth and fetal development, coupled with limited access to antenatal care. Anemia causes fatigue, irregular menstruation, and poor physical and mental health effects. High rates of maternal mortality, low birth weight kids, and perinatal and lethal waste are all linked to anemia in teenage girls. The present attempt explores the magnitude of anemia in adolescent girls by comparing the data of NFHS 4th and 5th edition datasets.

Anemia is a significant health issue among adolescent girls in India, with prevalence rates ranging from 21% to 90%, and factors contributing to anemia include inadequate iron intake, worm infestation, low body mass index, and poor socioeconomic status (Dhillon et. al. 2021). The highest rates are found in Jharkhand and among older, illiterate, and economically disadvantaged girls (Bharati et. al., 2009). The

problem is particularly acute in tribal areas (Daniel et. al. 2023). Efforts to address anemia should focus on improving the economic status of families, enhancing education, and promoting the consumption of iron-rich foods and supplements (Bharati, 2009; Goyal, 2018). In India, almost half of teenage girls enrolled in school still have anemia (Goyal 2018, Gupta & Singh, 2020). All girls should receive nutrition instruction, iron folic acid pills, and dietary supplements (Kulkarni et. al. 2012). Anemia is significantly correlated with helminth control, nutritional supplementation, dietary changes, and socioeconomic level (Chandrakumari et al. 2019). females with iron and folate deficiencies were 2.5 and 4 times more likely to develop anemia compared to non-anemic females (Gupta et. al., 2022). Anemia affects adolescent girls' nutritional status, and it is more common among people in lower socio-economic groups and those with parents who have lower levels of education. (Chaudhry and Dhage, 2008). Compared to other less developed countries, India has observed a greater frequency of anemia in adolescent girls. (Chatterjee, 2008). All socioeconomic categories and geographical areas are at high risk for anemia, but the urban poor are more vulnerable (Bentley and Griffiths 2003). The mother's level of education had a protective impact on anemia, and anemia was common among Haryana's rural adolescent females who had reached menarche (Subramanian, 2022). Pregnant women experience anemia at a higher rate than non-pregnant women (Bala, 2023). Adolescent girls in India have a startlingly high frequency of anemia; 73% of the girls had, primarily mild or moderate anemia (Gupta and Singh, 2020). According to Biradar et al. (2012), anemia was more common in teenage girls who were younger (10 years old) and older (>14 years old), as well as those from poorer socioeconomic backgrounds. Worm infestation, food, parental education, and undernutrition were all substantially correlated with anemia. In Bhopal, India, the frequency of anemia among teenage schoolgirls was 58.4%, and it was correlated with age, knowledge, literacy, and food. Adolescent girls in South Asia frequently eat insufficient diets to provide them with the nutrients they require for normal growth and development (Aguayo and Paintal, 2017). Ninety percent of teenage females had anemia, which was largely caused by iron deficiency or dimorphic anemia and was substantially correlated with parental education and socioeconomic position (Upadhye & Upadhye, 2017). The presence of anemia was substantially correlated with the mother's occupation, birth order, type of family, place of living, school type, diet type, and consumption of IFA tablets (Goyal and Rawat, 2018). Anemia is highly prevalent in rural girls because of higher worm infestation due to environmental sanitation, poor hygiene, and disposal of waste (Vasanthi et.al. 1994). In the lower economic group, anemia is highly associated with the father's occupation, and in the middle and higher economic groups, it is associated with the mother's education (Gawarika et. al. 2006).

2. DATA SOURCE AND RESEARCH METHODOLOGY

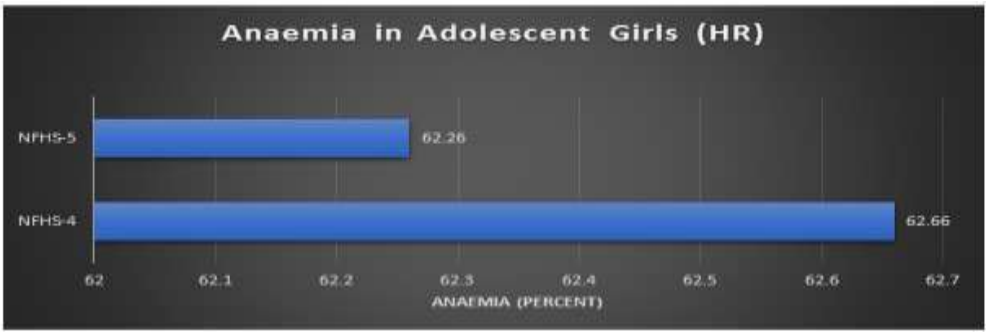
The present attempt is based on secondary data from the NFHS editions 4th and 5th conducted by IIPS, Mumbai. To explore the prevalence of anemia, the study used the methodology given by WHO. WHO classified Anemia into three degrees (1) Mild: Hemoglobin 10.0 g/dl -12 g/dl (2) Moderate: Hemoglobin 8.0-10.0 g/dl. (3) Severe: Hemoglobin 6.5-7.9 g/dL.

WHO classification of anemia degrees:

Mild - anemia	<11.9 gm to gm Hb / 100ml blood
Moderate - anemia	9.9gm to 7gm Hb / 100ml blood
Severe- anemia	< 7gm Hb / 100ml blood
Anemia in non-pregnant women	<12 gm Hb / 100ml blood (above 15 years of age)

(***Source:*** WHO)

3. RESULTS AND FINDINGS



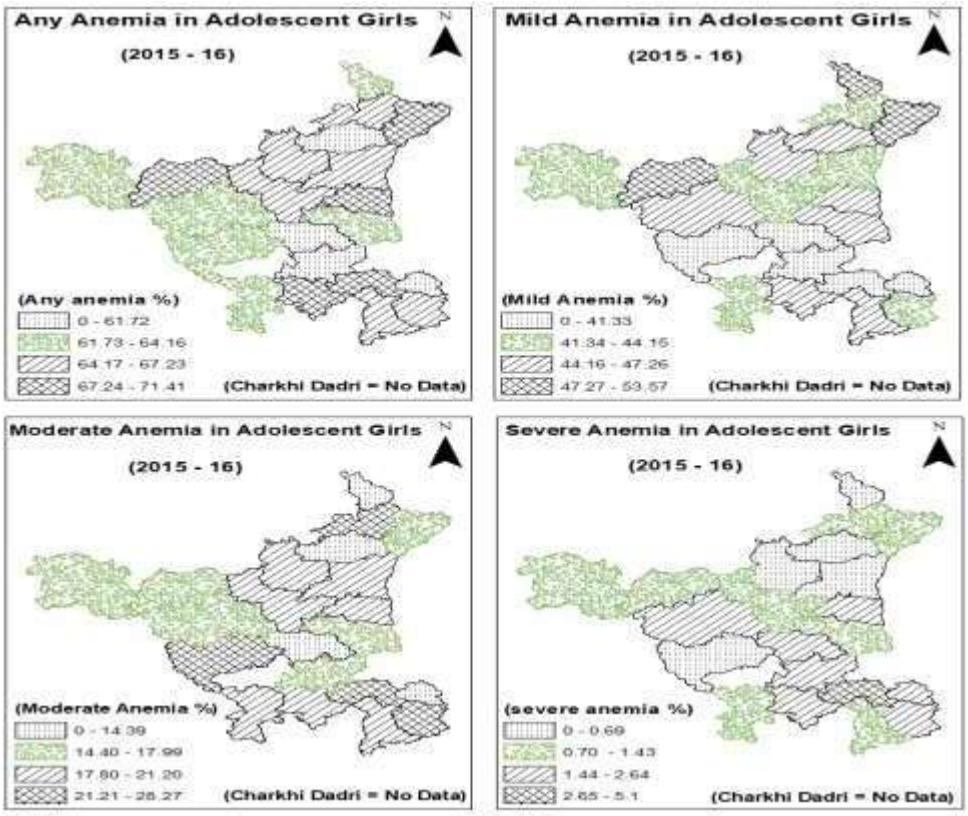
(Source: based on the author's calculations using NFHS-4 & 5)

International Journal of Environmental Sciences
ISSN: 2229-7359
Vol. 10 No. 4, 2024
https://www.theaspd.com/ijes.php

Table 1: Anemia in adolescent girls (15 -19 years) in NFHS-4(2015-2016)

Districts	Any Anemia	Mild Anemia	Moderate Anemia	Severe anemia
Panchkula	62.16	51.53	10.63	0
Ambala	67.23	43.33	23.19	0.71
Yamunanagar	69.15	53.57	14.83	0.75
Kurukshetra	55.58	45.62	9.95	0
Kaithal	64.16	46.17	17.99	0
Karnal	64.81	43.59	20.79	0.43
Panipat	71.41	47.26	21.2	2.94
Sonipat	60.54	44.78	15.06	0.7
Jind	65.08	42.14	21.53	1.4
Fatehabad	69.76	51.96	17.11	0.69
Sirsa	62.32	44.15	16.74	1.43
Hisar	63.53	47.35	13.54	2.64
Bhiwani	63.06	39.77	22.74	0.55
Rohtak	52.26	38.25	11.25	2.76
Jhajjar	55.09	38.23	14.39	2.47
Mahendergarh	61.72	41.44	18.66	1.63
Rewari	70.7	47.81	19.5	3.38
Gurgaon	70.01	36.64	28.27	5.1
Mewat	66.78	45.18	20.12	1.48
Faridabad	49.09	39.74	6.58	2.77
Palwal	65.68	41.33	22.37	1.98
Total	62.66	43.66	17.27	1.73

Figure 1: Anemia in adolescent girls (15 -19 years) in NFHS-4(2015-2016)



(Source: based on the author's calculations using NFHS-4 & 5)

The figure elaborates on four different categories of anemia in adolescent girls in Haryana in NFHS-4. In the first category, any anemia, Faridabad has the lowest percentage of anemia, followed by Rohtak and Jhajjar, and Panipat has the highest percentage of anemia among adolescent girls. In the second category

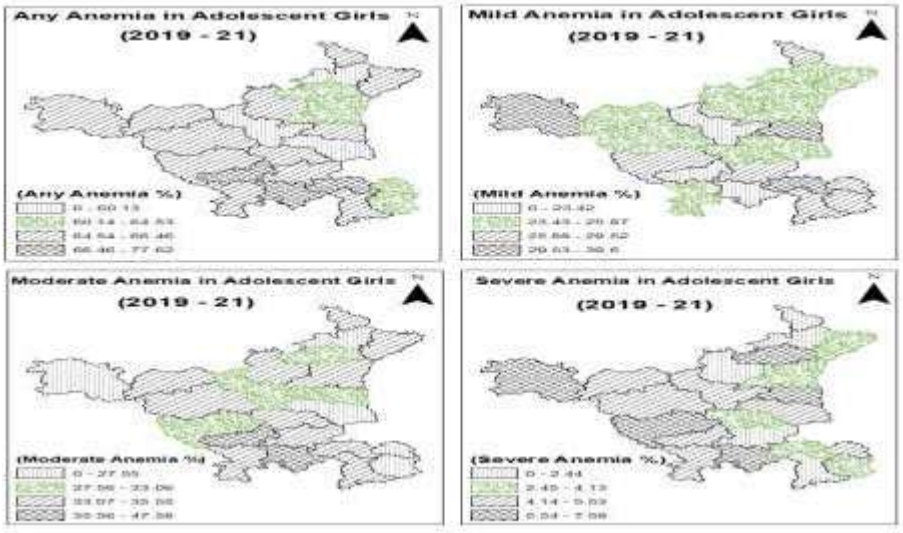
'mild anemia', Gurgaon has the lowest percentage of anemia, followed by Jhajjar, Rohtak, and Yamuna Nagar has the highest percentage of anemia in girls. Regarding moderate anemia in adolescent girls, Faridabad has the lowest percentage of anemia followed by Kurukshetra and Panchkula, and Gurgaon has the highest, which is 28.27 percent. The richest district of Haryana, Gurgaon, has the highest percentage of severe anemia, which is 5.1 percent. Panchkula, Kurukshetra, and Kaithal are the districts where severe anemia among adolescent girls does not exist. There is no data available for Charkhi Dadri in NFHS-4 because it was part of the Bhiwani district at the time of the survey.

Table 2: Anemia in adolescent girls (15 -19 years) in NFHS-5 (2019-2021)

Districts	Any anaemia	Mild Anaemia	Moderate Anaemia	Severe Anaemia
Panchkula	64.81	27.52	35.34	1.95
Ambala	49.15	22.41	25.11	1.64
Yamunanagar	63.4	25.32	32.28	2.8
Kurukshetra	57.72	22.97	28	6.75
Kaithal	64.26	24.93	37.56	1.76
Karnal	61.51	24.74	33.41	3.36
Panipat	66.29	33.16	27.41	5.73
Sonipat	52.75	25.78	22.78	4.19
Jind	50.68	17.55	28.28	4.85
Fatehabad	66.49	26.64	35.01	4.84
Sirsa	64.86	32.49	26.35	6.02
Hisar	63.55	24.92	33.37	5.26
Bhiwani	67.1	30.03	29.48	7.59
Rohtak	63.11	25.96	34.58	2.56
Jhajjar	65.19	27.54	36.29	1.36
Mahendergarh	67.25	22.99	38.68	5.58
Rewari	71.84	18.24	47.58	6.02
Gurgaon	77.62	39.6	35.62	2.41
Mewat	66.4	31.52	32.75	2.12
Faridabad	55.89	27.98	23.84	4.07
Palwal	59.67	30.77	26	2.9
Charkhi Dadri	71.11	21.15	44.57	5.39
Total	62.26	26.84	31.34	4.08

(Source: based on the author's calculations using NFHS-4 & 5)

Figure 2: Anemia in adolescent girls (15 -19 years) in NFHS-5 (2019-2021)



(Source: based on the author's calculations using NFHS-4 & 5)

The figure 2 shows anemia among adolescent girls in the National Family Health Survey Five (2019-21). Gurgaon has the highest percentage of any anemia followed by Rewari, Charkhi Dadri and Ambala has

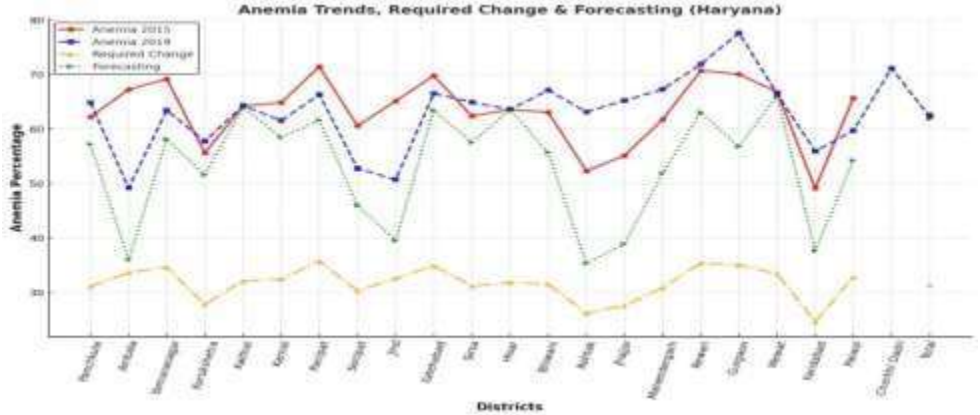
the lowest percentage, which is 49.15 percent. Jind has the lowest cases of mild anemia with a share of 17.55 percent, followed by Rewari, and Gurugram has the highest cases of mild anemia in adolescent girls with 39.60 percent, which completely contradicts the scenario of NFHS-4. Sonipat and Faridabad are at the bottom with 22.78 percent and 23.84 percent in case of moderate anemia, Rewari has 47.58 percent, and Charkhi Dadri has topped with 44.57 percent cases of moderate anemia. In the case of severe anemia, Jhajjar has the lowest 1.36 percent cases, and Bhiwani has the highest number of cases of severe anemia, with a share of 7.59 percent. Gurugram is one of the developed districts of Haryana State in terms of health, education, and income, but in the case of adolescent anaemia, the picture is not so good because of busy lifestyles and carelessness about women's health and high migration from nearby districts and states.

Table 3: Required Changes and Projections for 2025

Districts	Any anemia 2015	Any anemia 2019	Difference	CADR	Required change	Required CADR	2025
Panchkula	62.16	64.81	-2.65	0.83	31.08	-6.69	57.18
Ambala	67.23	49.15	18.08	-6.07	33.615	-6.69	35.94
Yamunanagar	69.15	63.4	5.75	-1.72	34.575	-6.69	58.13
Kurukshetra	55.58	57.72	-2.14	0.75	27.79	-6.69	51.54
Kaithal	64.16	64.26	-0.1	0.03	32.08	-6.69	63.96
Karnal	64.81	61.51	3.3	-1.03	32.405	-6.69	58.43
Panipat	71.41	66.29	5.12	-1.47	35.705	-6.69	61.58
Sonipat	60.54	52.75	7.79	-2.71	30.27	-6.69	45.99
Jind	65.08	50.68	14.4	-4.87	32.54	-6.69	39.5
Fatehabad	69.76	66.49	3.27	-0.95	34.88	-6.69	63.4
Sirsa	62.32	64.86	-2.54	0.8	31.16	-6.69	57.51
Hisar	63.53	63.55	-0.02	0.006	31.765	-6.69	63.49
Bhiwani	63.06	67.1	-4.04	1.24	31.53	-6.69	55.66
Rohtak	52.26	63.11	-10.85	3.84	26.13	-6.69	35.32
Jhajjar	55.09	65.19	-10.1	3.42	27.545	-6.69	38.89
Mahendergarh	61.72	67.25	-5.53	1.73	30.86	-6.69	51.83
Rewari	70.7	71.84	-1.14	1.14	35.35	-6.69	63.04
Gurgaon	70.01	77.62	-7.61	2.08	35.005	-6.69	56.73
Mewat	66.78	66.4	0.38	-0.11	33.39	-6.69	66.04
Faridabad	49.09	55.89	-6.8	2.62	24.545	-6.69	37.64
Palwal	65.68	59.67	6.01	-1.9	32.84	-6.69	54.21
Charkhi Dadri		71.11	-71.11				
Total	62.66	62.26	0.4	-0.128	31.33	-6.69	61.86

(Source: based on the author's calculations using NFHS-4 & 5)

Figure 3: Anemia Trends and 2025 projection

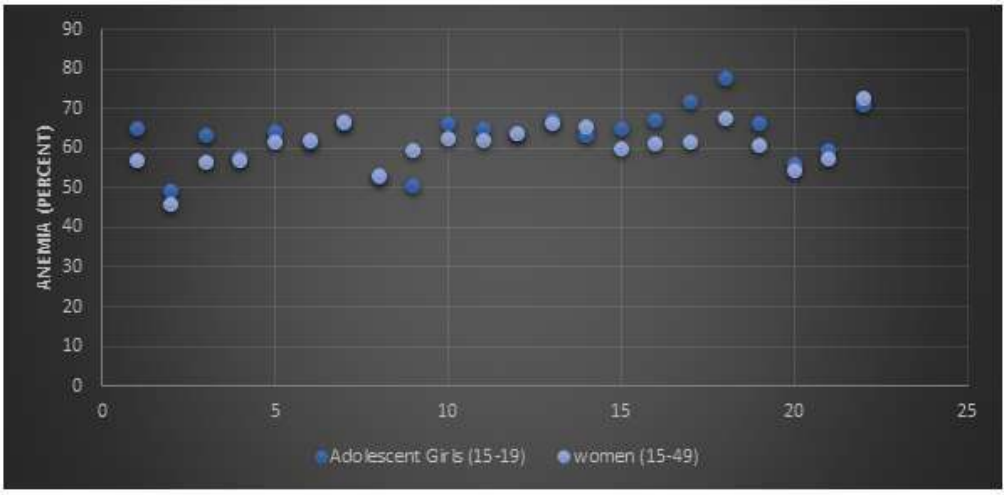


(Source: based on the author's calculation using NFHS-4 & 5)

The required reduction in anemia prevalence between districts is 31.65%, which shows how much reduction is required to reach optimal levels of health. The data shows only a minor reduction in anemia

in five years from 2015 to 2020, with a compounded annual decrement rate of -0.128 at the Haryana level, but some districts showing an increase instead of a decrement in anemia. The trend in projection, with a mean anemia rate estimated to be 53.5%, shows that there will be improvement, but that current measures will not be sufficient to reach international and national health targets

Figure 4: Comparison of Anemia among Women (15-49) & Adolescent Girls (15-19) in NFHS-5



(Source: based on the author's calculation using NFHS-4 & 5)

The above figure indicates a comparison of anemia between all women (15-49) and adolescent girls (15-19) in NFHS-5. In almost all districts, anemia was higher in adolescent girls than women except in Jind, Rohtak, Sonipat, and Charkhi Dadri. Data show minor differences between anemic women and adolescent girls in districts Kurukshetra, Karnal, Panipat, Sonipat, Hisar, and Bhiwani. Gurugram, Rewari, Jind, and Mahendergarh are the districts that show major differences between the two.

5. CONCLUSION

The Government of India has taken various initiatives to control the prevalence and incidence of anemia, especially among women and adolescents like Weekly Iron and Folic Acid Supplementation (WIFS) program, Anemia Mukt Haryana, Integrated Child Development Scheme, Poshan Abhiyan, SABLA Scheme, Nutritional Support through Mahila Mandals and Self-help groups, and National Nutrition and Anemia Control Program (NNACP) was launched at the health center and school level. After taking so many steps, anemia is still a major issue in Haryana, which contradicts the state's generally prosperous image. According to survey results, the majority of Adolescent girls in Haryana are anemic. The public must be more conscious of healthy living conditions and wholesome eating practices. Through community involvement in exercise and health initiatives, anemia and nutritional conditions can be further improved. The present attempt is helpful for the government to increase the effectiveness of anemia prevention programs and nutrition awareness initiatives.

7. REFERENCES

1. Chaudhary SM, Dhage VR, 2008, Study of anemia among adolescent females in the urban areas of Nagpur. *Indian J Community Med*, 33, 245-8.
2. Chatterjee, 2008, Nutritional needs of adolescents. *Paediatrics Today*, 3, 110-4.
3. Bentley and Griffiths, 2003, The burden of anemia among women in India, *European Journal of Clinical Nutrition*, 57, 52–60.
4. Subramanian et. al. 2022, Prevalence of Anemia Among Adolescent Girls Residing in Rural Haryana: A Community-Based Cross-Sectional Study, *Cureus* 14(1): e21091. DOI 10.7759/cureus.21091
5. Bala, 2023, Anemia - A cause of Concern: Experience from Haryana, *International Journal of Novel Research and Development,* 8(12), 298-306.
6. Gupta and Singh, 2020, STUDY OF ANEMIA AMONG ADOLESCENT GIRLS, *International Journal of Medical and Biomedical Studies*, 4(1), 80-81.
7. Biradar et. al. 2012, Prevalence of Anaemia among Adolescent Girls: A One Year Cross-Sectional Study, *Journal of Clinical and Diagnostic Research*, 6(3), 372-377
8. Kanodia et. al. 2016, A study of anemia among adolescent girls in eastern part of Nepal, *Journal of College of Medical Sciences-Nepal*, 12 (1), 19-21.
9. Kakker et. al. 2011, Study of anemia in adolescent school girls of Bhopal, *Indian Journal of Community Health*, 23(1), 38-40.
10. Aguayo and Paintal, 2017, Nutrition in adolescent girls in South Asia, *British Medical Journal,* 357, 1-4.

11. Upadhye and Upadhye, 2017, Assessment of anemia in adolescent girls, *International Journal of Reproduction, Contraception, Obstetrics, and Gynaecology*, 6(7), 3113-3117.
12. Goyal and Rawat, 2018, A study of anemia and its correlates among adolescent girls in schools of Haldwani, India, *International Journal of Research in Medical Sciences*, 6(10), 3320-3326.
13. Vasanthi et. al. 1994, Iron Nutritional Status of adolescent Girls from Rural area and Urban slums. *Ind. Pediatrics*, 31, 117-132.
14. Gawarika et. al. 2006, Prevalence of Anemia in Adolescent Girls Belonging to Different Economic Group, *Indian Journal of Community Medicine*, 31(4), 287-288.
15. Bharti et. al. 2009, Burden of anemia and its socioeconomic determinants among adolescent girls in India, Food and Nutrition Bulletin, 30(3), 217-226.
16. Kulkarni et. al. 2012, PREVALENCE OF ANEMIA AMONG ADOLESCENT GIRLS IN AN URBAN SLUM, *National Journal of Community Medicine*, 3(1), 108-111.
17. Gupta & Singh, 2020, STUDY OF ANEMIA AMONG ADOLESCENT GIRLS, *International Journal of Medical and Biomedical Studies*, 4(1), 80-81.
18. Daniel et. al. 2023, Prevalence of anemia among adolescent girls (10–19 years) in India: A systematic review and meta-analysis, *THE NATIONAL MEDICAL JOURNAL OF INDIA*, 36(4), 233-240.
19. Chandrakumari et. al. 2019, Prevalence of Anemia Among Adolescent Girls in a Rural Area of Tamil Nadu, India, *Journal of Family Medicine and Primary Care*, 8(4), 1414-1417.
20. Gupta et. al. 2022, Characterisation of anemia amongst school going adolescent girls in rural Haryana, India, *Public Health Nutrition*, 25(12), 3499–3508.
21. Dhillon et. al. 2021, Prevalence of Anemia given Sociodemographic and Health Status of Adolescent Girls Enrolled in Government School at Border-belt of Indian Punjab, *Ecology of Food and Nutrition*, 60(2), 198–211.
22. NFHS Reports, Fact Sheets and GOI reports.
23. World Health Organisation Reports.
24. Hassan et al. (2008). Gender bias and economic development in India: A case study of Haryana. *Social Change*. 38. 226-244. 10.1177/004908570803800204.
25. Hooda et al. (2017). Dynamics of inter-district developmental disparities in Haryana. *Journal of Applied and Natural Science*. 9. 983-991. 10.31018/jans. v9i2.1307.
26. Devender & Kumar, (2022). Regional Disparities in Social Development in Haryana. *South Asian Journal of Social Studies and Economics*.16. 10-18. 10.9734/SAJSSE/2022/v16i4617.