



Anaemia among Adolescent Girls in Kinnaur: Socio-Economic Analysis

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Abstract

Anaemia, besides its biological and physiological determinants, to a considerable extent is also influenced by the social and economic conditions of the adolescent girls. The rationale being socio-economic factors differentially affect the ability of households to afford adequate nutrition to the growing girls. A number of studies point out the significance of social and economic factors in the incidence of anaemia. In view of the underlying assumption, a survey based on a sample of 1437 adolescent girls, studying in 21 schools in district Kinnaur in Himachal Pradesh was carried out. The block-wise 10 schools were taken from Kalpa, 5 from Pooh, and 6 from Nichar. The block-wise sample taken randomly was 756 adolescent girls from Kalpa, 263 from Pooh, and 418 from Nichar block. All the girls included in the test underwent Hb test to find out how many suffer from anaemia and their socio-economic background. The study found that majority of the girls have haemoglobin 8.9 and 9 to 11, whereas only few girls are having haemoglobin 12 plus. The study makes significant revelations social, demographic and economic factors have a determining effect on anaemia among adolescent girls.

Key Words: Health, Anaemia, Adolescent Girls, Kinnaur,

Introduction:

Women health, world over raises serious concerns as almost 1,15,000 maternal deaths and 5,91,000 peri-natal deaths occur globally due to anaemia (Ezzati *et al.* 2004 cited in Kumar 2014: 24) and the associated health issues. This is a fact that woman health is shaped during her early period of growth to make her adolescence period and youth healthy for a better reproductive life. Unfortunately, in India half of the pregnant women, 59 per cent of the children under five years of age, 54 per cent of adolescent girls, 53 per cent of the non-pregnant, and non-lactating women in India are anaemic (TNS 2022). The concerns become serious as India with 253 million adolescents, children in the 10 to 19 years age

group, are feared to lose their potential due to health issues, particularly anaemia. UNICEF noted 40 per cent adolescent girls and 18 per cent boys are anaemic which affects their growth. Such children are unable to resist infections and resultantly their cognitive development and work productivity suffers. The adolescent children are highly important, even if they had suffered early age nutritional deficiencies. According to UNICEF, adolescents present an opportunity to the nation-state to correct nutritional deficiencies that may have occurred in early life and to catch up on growth (www.unicef.org/india/what-we-do/adolescent-nutrition). With reference to adolescent girls, iron deficiency becomes a serious cause of worry as the future health of society depends upon their reproductive health.

Among various causes, iron deficiency is described as the one prevalent globally. In addition, other conditions, such as acute chronic inflammation, parasitic infections, and other deficiencies, such as folate, vitamin B12 also contribute to its causation (Kumar 2014: 24). The iron deficiency induced anaemia is not only a health condition but has severe implications for women during their reproductive life-span. This is argued that anaemic mothers are likely to suffer post-partum hemorrhage, neural tube defects, low birth weight, premature births, still births, and maternal deaths. The lowered immunity, poor cognitive development and decreased work productivity are also found associated with anaemia in some populations (TNS 2022). However, Himachal Pradesh, which during 2018-19 was placed at 18th on this index, has performed excellently and reached 3rd spot which is a remarkable achievement (TNS 2022). However, within the state district-wise variations cannot be ruled out. In view of which this paper examines the relationship between age, education, parents' occupation, income, and discriminatory practices, if any against girl child in the household.

Table 1: Age-wise Anaemia Levels among Adolescent Girls

Block	Age	Haemoglobin			Total
		Up to 8.9	9 to 11	12+	
Kalpa	11 to 13	12	22	4	38
		4.47	5.01	8.16	5.02
	14 to 16	115	203	35	353
		42.91	46.24	71.42	46.69
	17 to 19+	141	214	10	365
	52.61	48.74	20.40	48.28	
Total		268	439	49	756
		100.00	100.00	100.00	100.00
Pooh	11 to 13	-	2	-	2
		-	1.24	-	0.76
	14 to 16	24	69	11	104
		29.62	42.85	52.38	39.54
	17 to 19+	57	90	10	157
	70.37	55.90	47.61	59.69	
Total		81	161	21	263
		100.00	100.00	100.00	100.00
Nichar	11 to 13	6	18	2	26
		8.45	5.96	4.44	6.22
	14 to 16	57	173	18	248
		80.28	57.28	40	59.33
	17 to 19+	8	111	25	124
	11.26	36.75	55.55	34.44	
Total		71	302	45	418
		100.00	100.00	100.00	100.00

The age constitutes one of the most significant demographic variables. The rationale of taking this for analysis is to analyse at which age the problem is more among the adolescent girls. Almost all these girls had attained puberty recently. The block-wise situation indicates that in Kalpa block, the most vulnerable age is 17 to 19 in which maximum girls are relatively more anaemic with their hb is only up to 8.9 gm. Similar situation exists in Pooh block with majority of the girls falling in the low hb. However, in Nichar, the majority of the girls in the 14 to 16 age group suffer from high anaemic condition. The number of those in the less than 13 years age is very negligible. Perhaps, age at the onset of puberty matters. In the 9 to 11 gram Hb category, the maximum number is in the 17 plus age category followed by 14 to 16 years age girls. The data also shows similarly in the case of Pooh block. However, in the case of Nichar block, the maximum number of girls having 9 to 11 gram hb is in the 14 to 16 age group and unlike other two blocks it declines in the 17 to 19 years age group. Those who have hb more than 12 gram fall in the 14 to 16 years in Kalpa and Pooh. In comparison to Kalpa and Pooh, in Nichar, the maximum number of girls having 12 plus hb falls in the 17 to 19 age group. On the whole 14 years to 19 years is found as the most vulnerable age for adolescent girls to be anaemic.

Table 2: Level of Education and Anaemia

Block	Year of Education	Haemoglobin			Total
		Up to 8.9	9 to 11	12+	
Kalpa	8 th	30	52	12	94
		11.19	11.04	24.48	12.43
	9 th	54	134	20	208
		20.14	30.52	40.81	27.54
	10 th	56	74	8	138
		20.89	16.85	16.32	18.25
	11 th	58	107	9	174
		21.64	24.37	18.36	23.01
	12 th	70	72	-	142
		26.11	16.40	-	9.88
Total		268	439	49	756
		100.00	100.00	100.00	100.00
Pooh	9 th	6	31	2	39
		7.40	19.25	9.52	14.82
	10 th	20	47	8	75
		24.69	29.19	38.09	28.51
	11 th	34	58	8	100
		41.97	36.02	38.09	38.02
	12 th	21	25	3	49
		25.92	15.52	14.28	18.63
Total		81	161	21	263
		100.00	100.00	100.00	100.00
Nihar	8 th	26	45	8	79
		36.61	14.90	17.77	18.89
	9 th	27	72	-	99
		38.02	23.84	-	23.68
	10 th	14	77	11	102
		19.71	25.49	24.44	24.40
	11 th	3	65	17	85
		4.22	21.52	37.77	20.33
	12 th	1	43	9	53
		1.40	14.23	20	12.67
Total		71	302	45	418
		100.00	100.00	100.00	100.00

The level of education is generally associated with the levels of knowledge and awareness about anaemia. It is therefore expected that higher the level of education the higher is expected to be the level of awareness among adolescent girls. However, the data indicate that with the increase in the educational level the number of girls with 8.9 hb also goes up in Kalpa block, thereby indicating no effect. However in the moderate anaemia category (9 to 11 hb) the data suggest changes as with rise in educational level the number starts fluctuating. However, those who are in the 12 plus hb the rise in the education indicates decline in the number. In comparison to Kalpa block, Pooh the analysis of data reveals that in the less than 9 gram Hb category the maximum number is in class eleventh followed by twelfth and tenth. In comparison to Kalpa block the number of anaemic students in class twelfth is more in Pooh. In the 9 to 11 gram Hb category the trend is almost the same as is found in the case of less than 9 gram Hb. However, in the 12 plus gram Hb category the

trend indicates some change with maximum number falling in the tenth and eleventh class followed by others. The situation in Nichar block reveal the maximum concentration of students in class tenth and ninth followed by eleventh, eighth and others. The distribution of adolescent girl students further indicate that in less than 9 gram Hb the maximum percentage of students is in class ninth and eighth followed by others. But this trend changes considerably in the case of those who are in 9 to 11 gram Hb category. Here the maximum number is found in tenth class followed closely by the students of class ninth, eleventh and others. But in the case of girl students with 12 plus gram Hb the maximum number of students are from class eleventh and tenth and others. The education and the levels of haemoglobin as such do not have any relationship neither from medical nor from sociological point of view. However, from the point of view of identification of anaemic students in the schools of the three blocks the analysis suggest lack of health education in schools, though school health has been on agenda of the successive governments.

Table 3: Father's Occupation-wise Distribution of Haemoglobin Levels

Block	Occupation	Haemoglobin			Total
		Up to 8.9	9 to 11	12+	
Kalpa	No Occupation	2	-	-	2
		0.76	-	-	0.26
	Pensioner	8	15	-	23
		3.07	3.44	-	3.09
	Agriculture & Horticulture	145	238	26	409
		55.76	54.71	53.06	54.97
	Service	83	155	16	254
		31.92	35.63	32.65	34.13
	Small Business	11	22	7	40
		4.23	5.05	14.28	5.37
Others	11	5	-	16	
	4.23	1.14	-	2.15	
Total*		260	435	49	744
		100.00	100.00	100.00	100.00
Pooh	Pensioner	-	1	1	2
		-	0.68	4.76	0.85
	Agriculture & Horticulture	50	108	117	165
		74.62	67.08	94.35	70.51
	Service	16	34	3	53
		23.88	21.11	2.41	22.64
	Small business	-	-	1	1
		-	-	0.80	0.42
	Others	1	-	2	3
		1.49	-	1.60	1.28
Total*		67	143	124	234
		100.00	100.00	100.00	100.00
Nichar	Pensioner	2	9	1	12
		2.85	3.01	2.27	2.90
	Agriculture & Horticulture	39	129	29	197
		55.71	43.13	65.90	47.79

	Service	25	129	11	165
		35.71	43.14	25	39.95
	Small business	4	26	3	33
		5.71	8.69	6.81	7.99
	Others	-	6	-	6
		-	2.00	-	1.45
Total*		70	299	44	413
		100.00	100.00	100.00	100.00

* N varies based on the responses. Missing numbers indicate No response.

The occupational background has direct relationship with lifestyles, knowledge and response to health issues. In all the three blocks, the majority of the adolescent girls coming from agriculture and horticulture background fall in the up to 8.9 hb category followed by the service class. The same is true of the girls falling in the 9 to 11 hb category. The reason being, by and large the parents of the girls involved in horticulture and agriculture have small land holdings. Due to which their capacity to provide rich diet is difficult. Moreover, the area being snow bound with severe cold weather from October to March, the productivity remains low, especially green vegetables. Those who come from service background, the majority of the parents hold class III and IV jobs. While few are in the government service the majority among them is engaged in the private sector jobs. It is important to mention here that basically the low level of income of people, whether in agriculture or service that plays important role in determining diet patterns and consequently levels of hb and anaemia.

Table 4: Income-wise Hemoglobin Levels

Block	Income in Rs. Per month		Haemoglobin			Total
			UP to 8.9	9 to 11	12 Plus	
Kalpa	1000	2500	27	32	3	62
			21.95	16.93	17.64	18.84
	2501	5000	42	75	7	122
			34.14	38.62	41.17	37.08
	5001	7500	9	29	2	40
			7.31	15.34	11.76	12.15
	7501	10,000	39	47	2	88
			31.70	24.86	11.76	26.74
	10,001	12,500	4	4	3	11
			3.25	2.11	17.64	3.34
12,501	15,000	2	3	-	5	
		1.62	1.58	-	1.51	
17,501	20,000	-	1	-	1	
		-	0.52	-	0.30	
Total*			123	191	17	329
			100.00	100.00	100.00	100.00
Pooh	1000	2500	-	6	1	7
			-	25.00	16.66	23.33
	2501	5000	-	10	2	12
			-	41.66	33.33	40.00
	5001	7500	-	1	2	3
			-	4.16	33.33	10.00
	7501	10,000	-	6	1	7
-			25.00	16.66	23.33	

	10,001	12,500	-	1	-	1
			-	4.16	-	3.33
Total*			-	24	6	30
			-	100.00	100.00	100.00
Nichar	1000	2500	-	3	-	3
			-	3.94	-	3.37
	2501	5000	3	23	-	26
			50.00	30.26	-	29.21
	5001	7500	1	14	3	18
			16.66	18.42	42.85	20.22
	7501	10,000	2	27	3	32
			33.33	35.52	42.85	35.95
	10,001	12,500	-	1	-	1
			-	1.31	-	1.12
	12,501	15,000	-	4	1	5
			-	5.26	14.28	5.61
	15,001	17,500	-	1	-	1
			-	1.31	-	1.12
	17,500	20,000	-	2	-	2
			-	2.63	-	2.24
	20,001	Plus	-	2	-	2
			1.31	-	1.12	
Total*			6	76	7	89
			100.00	100.00	100.00	100.00

* N in all the totals is less than the actual as all the students did not specify the income.

Income is considered to be the most effective intervening variable that to a considerable extent determines the quality of diet and nutrition on which depends the level of haemoglobin. However, the overall income scenario of the home of the adolescent reveals majority has meagre income. Since the data was collected from the girls there was no way to ensure that all of them provided a true picture of their parents' income. Also a large number of them also could not reveal their income of their parents. Due to which it became difficult to spell out the actual impact. However, whatever information given by the adolescent girls revealed that in Kalpa block the income of maximum number of girls' father's was Rs.2501 to 5000 per month followed by those with an income of Rs.7501 to 10,000 per month, Rs.1000 to 2500 per month and Rs.5001 to 7500 per month. The remaining girls' fathers though have higher income but represent a very small number. The analysis of the relationship between income and the levels of Hb indicate that in less than 9 grams Hb category the largest number of the adolescent girls is in the Rs.2501 to Rs.5000 category followed by those in the Rs.7501 to Rs.10000 income category. The data in this category suggests a somewhat inverse relationship i.e. in the higher income group smaller number of the adolescent girls with less than 9 gram Hb and vice-versa. In the case of 9 to 11 gram Hb category again similar trend is found to exist indicating thereby an inverse relationship to a limited extent. However, the data in the 12 plus grams Hb category indicate that with the successive rise in the levels of income the number of the adolescent girls also increases substantially from 17.64 per cent to 41.17 per cent. But after this the trends stops as there are not many with higher levels of income. This trend in a limited way also supports the above stated inverse relationship. But at the same time the presence of substantial number of adolescent girls in each category of Hb prevents the relationship to acquire significance.

In the case of Pooh block the income-wise distribution of the respondents' fathers indicates the maximum number falling in the Rs.2501 to Rs.5000 category followed by Rs.1000 to Rs.2000 and Rs.7501 to Rs.10000 per month. The remaining are having higher income but in very small number. The further analysis of income and levels of Hb reveals that no one in Pooh block falling in the less than 9 gram Hb category. This is because of the fact that many of the adolescent girls did not speak out about the income of their father. However the data in the 9 to 11 gram Hb category indicate the maximum of the girls are in the Rs.2501 to Rs.5000 income category followed by those in Rs.1000 to Rs.2500 and Rs.7501 to Rs.10000 per month income. In the 12 plus gram Hb category the data indicate that the largest number of respondents is in the Rs.2501 to Rs.5000 and Rs.5001 to Rs.7500 per month category. Then increase in the number of girls with the successive rise in the levels of income in the higher category of Hb. is indicative of a positive relationship between income and the levels of Hb. However, the analysis remains limited due to limited reporting of income by the girls.

In the Nichar block the income levels of the fathers of the respondents discern that more than one-third are in the income group Rs.7501 to Rs.10000 per month followed by those in Rs.2501 to 5000 and Rs.5001 to Rs.7500. The remaining, although have higher income are very less in number. The further analysis of the income and the levels of Hb indicate that in less than 9 gram Hb category the maximum number is in higher income category and lesser number in the less income categories. In the 9 to 11 gram Hb category a somewhat similar trend with some fluctuations is visible. The data also indicate a somewhat similar trend in the case of 12 plus gram Hb category. Instead of increasing the number in the higher income category the number of girls tends to decrease. The foregoing data analysis indicates that the income which is expected to be inversely related with levels of Hb only reveals limited relationship. This is perhaps due to the fact that all the students did not reveal the true income of their fathers. Therefore the relationship, even when the data has not revealed, cannot be ruled out.

Table 5: Discrimination Against Girl Child and the Levels of Hemoglobin

Block	Discrimination	Haemoglobin			Total
		Up to 8.9	9 to 11	12 plus	
Kalpa	No Response	1	-	-	1
		0.37	-	-	0.13
	Yes	-	1	-	1
		-	0.22	-	0.13
	No	267	436	49	752
		99.62	99.77	100	99.73
Total		268	437*	49	754
		100.00	100.00	100.00	100.00
Pooh	No	80	160	21	261
		100.00	100.00	100.00	100.00
Total		80*	160*	21	261
		100.00	100.00	100.00	100.00
Nichar	No	70*	298*	45	413
		100.00	100.00	100.00	100.00
Total		70	298	45	413
		100.00	100.00	100.00	100.00

* N less than the actual occurs due to No response.

One of the factors often cited for malnutrition and high anaemic incidence is the discrimination against girl child observed in many societies. But in the case of Kinnaur this does not seem to be true. Almost all the girls in all the three blocks have indicated no practice of discrimination against the girl child. It may therefore be argued that the existence of anaemia is not caused by discriminatory practices.

Conclusion

After having examined the social, demographic and economic characteristics of the adolescent girls and the cross-examination of these variables with the levels of Hb two important dimensions emerge. First, there are approximately 28 per cent of the adolescent girls suffering from severe anaemia with their Hb level below 9 gram, around 63 per cent with moderate anaemia with 9 to 11 gram Hb and only about 9 per cent girls who have their Hb hovering around 12 plus. Second, most of the girls in the study come from families following agriculture as the predominant occupational calling of the people. This includes horticulture activities also. Since agriculture in the contemporary times has become high cost it is therefore resulting in lower incomes to the farmers. The income of the fathers and the households of the adolescent girls as a whole in majority cases is low. The impact of the social, demographic and economic variables on the levels of haemoglobin is there but its degree is found limited. In this paper the lapse in reporting true income by the adolescent children either due to lack of knowledge or deliberate hiding does not seem to have any impact, as the observations and information sought from schools also revealed low income group children studying in the government schools. The former seems to be the most plausible reason. It is therefore argued that the socio-economic factors do have an important role in relation to health and nutrition in direct or indirect manner.

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