ASSOCIATED SOCIO – DEMOGRAPHIC CORRELATES OF THE OCCURRENCE OF ANEMIA AMONG ADOLESCENT GIRLS OF THE SLUMS OF INDORE CITY

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Abstract: This study deals about the associated socio-demographic factors with Anemia among adolescent age Low Income Group girls of the urban slums. For the study purpose 1000 adolescent girls studying in the Government Schools and/or attending Anganwadies were selected randomly and screened for their Haemoglobin status to know about the occurrence of anaemia among them as per WHO criteria. A pre-tested and pre-designed Performa was used to collect the information of their socio-demographic characteristics. Obtained results revealed that 72% girls found having anaemia of different categories. 17.4% of girls had >= 4th birth order, majority of them (49.9%) belonged to moderately large or larger families. Only 13.5% and 13.7% fathers and mothers were having high school or more education. 18.1% fathers and 43.1% mothers were found illiterate. 21.2% and 2.8% mothers respectively were <18 yr and >30 yr of age at the birth of the girls. Family size and mother's education status showed significant association with the occurrence of anaemia. Significant percentage (37.4%) of girls reside in small houses, 67.7% in Mud houses. 71.4% had toilet facility at their home but 13% of girls were bound to go out for natural courses. majority. Association of some demographic condition found significant with the occurrence of anaemia among adolescent age girls. A morbid health status of the girls was also observed as 41.9% girls had a history of frequent infections and 24.2% girls had a history of known worm infestation which was not significantly different among the study groups. Similarly many of them reported delayed menarche and menstrual irregularities. Early onset of menarche, early cycle and heavy bleeding were reported more by anaemic girls but the difference is found not significant statistically.

Keywords: Socio – demographic profile, anaemia, adolescent girl.

Introduction: Adolescence is a transition age of children grows into young adults. These teen years are **a** period of intense growth, not only physically, but also mentally and socially. During this time, 20% of final adult height and 50% of adult weight are attained. [1] Because of this rapid growth, adolescents are especially vulnerable to anaemia. Proper nutrition, including adequate iron intake, plays an important part for to attain optimum growth and development. During adolescence, teenagers acquire those important knowledge and skills that pave way to them to become independent, successful young adults. Adolescents are at the highest risk of anaemia due to growth spurt. Among girls, however, menstruation increases the risk for iron deficiency anaemia throughout their adolescent and childbearing years. [2] Boys, on the other hand, are at risk for anaemia only during their adolescent growth spurt. Teenagers and adolescents in lower-income groups are also at a higher risk. However, children from all backgrounds can develop iron deficiency and iron deficiency anaemia. [3], [4].

In India, adolescent girls, who constitute a sizable segment of its population form a vulnerable group and are at a greater risk of morbidity and mortality. Anaemia is widely prevalent in India, a developing country and affects both sexes and all age groups. Girls' iron requirements increase dramatically during adolescent as a result of the expansion of the lean body mass, total blood volume and the onset of menstruation; these changes make adolescent girls more susceptible to anaemia, which has lasting negative consequences for them and for the survival, growth, development of their children later in life. In India - home to nearly 113 million adolescent girls – the prevalence of anaemia in adolescent girls is estimated at 56 per cent. In view of the scale of the problem,

it is important to understand the association of Socio-environmental factors with health. Environment and nutrition affect health very much but could not get so many attentions as do trade and economics. Hence, the present study was carried out to assess the association of the occurrence of anaemia among adolescent age girls anaemia with some socio-environmental and health conditions.

Materials and Methods: It is a cross-sectional study carried out in various schools of adjoining slums and Anganwadi Centers of the Indore City. 1000 unmarried, adolescent girls in the age group 13-17 years have chosen by purposive random sampling method who volunteered for the study. A pre-tested and pre-designed Performa was used to collect the information on socio-demographic characteristics like age, educational status of parents, family size, size of home and other basic amenities like Toilet facilities and source of potable water etc.

The haemoglobin estimation was done using cyanmethaemoglobin method. For interpretation of anaemia, WHO cut-off criteria for anaemia grading according to haemoglobin level were taken where in Hb >12g/dl was considered normal. The anaemia graded as Mild (10-12gm/ dl), Moderate (7-10gm/dl) and Severe (<7gm/dl). Data was entered and analyzed in SPSS 7.5. Percentage distribution and Chi test were used in making inferences.

Results:

Table No. 1 Prevalence of anemia among adolescent girls of the slums of Indore City				
Grade	**Count**	**%**	**Chi Value**	**P value**
Non Anemic	722	72.2	197.13	.000
Anemic	278	27.8		
Mild	357	35.7	211.240	.000
Moderate	344	34.4		
Severe	21	2.1		

Above tables indicates high occurrence of anaemia among the studied population. About 72.2% girls had haemoglobin level <12 gm%. A high occurrence of mild to moderate degrees (>7 to <12 gm/dl haemoglobin) of anaemia was also present which was covering almost 70% of the studied population. Only 27.8% girls had haemoglobin above 12 gm/dl.

Table No. 2 Socio – demographic profile of adolescent girls of low socioeconomic group					
Variable	**Option**	**count**	**%**	**Chi Value**	**P value**
Birth order	1st	300	30.0	264.60	.000
	2nd	329	32.9		
	3rd	195	19.5		
	4th	110	11.0		
	>4th	66	6.6		
No. of family members	Upto 5	453	45.3	369.54	.000
	5-10	499	49.9		
	> 10	48	4.8		
Father education	Illiterate	181	18.1	82.90	.000
	Upto 5th	368	36.8		
	H.Sc.	246	24.6		
	> H.Sc.	135	13.5		
Mother's education	Illiterate	431	43.1	301.64	.000
	Upto 5th	102	10.2		
	HSc.	137	13.7		
	> HSc.	223	22.3		
Mother age on birth (yr)	<18	212	21.2	531.240	.000
	18-20	223	22.3		
	20-30	536	53.6		
	>30	28	2.8		

From the above table – 2, it is obvious that significant percentage (17.4%) of girls had >= 4th birth order, majority of them (49.9%) belonged to moderately bigger or bigger families. The table further indicates that majority of the girls had lower levels of parental educations status, only 13.5% and 13.7% fathers and mothers were better educated having high school or more education. Also 18.1% fathers and 43.1% mothers were illiterate respectively of the studied adolescent girls. Similarly, 21.2% and 2.8% mothers respectively were <18 yr and >30 yr of age at the birth of the girls, though majority of them born within the 18-30 yr age of their mother. All the socio-demographic features found significantly different statistically among adolescent girls of the urban slums.

From the below table -3 and from the following graph it is obvious family size and mother's education status have significant association with the occurrence of anemia among adolescent girls. The girls who belonged to >5 or >10 family members and girls whose mothers were illiterate or had lower education status were significantly higher in anemic category than their normal counterparts. Father's education, birth order and mother's age at the girl's birth were found no significant association with the occurrence of anemia.

Table No. 3 Personal background of the anemic and non anemic girls					
Variable	Option	Anemic (%age)	Non anemic (%age)	Chi Value	P value
Birth order	1st	31.9	29.5	1.73	.188
	2nd	31.9	31.0		
	3rd	13.9	21.0		
	4th	11.1	11.0		
	>4th	2.8	7.5		
No. of family members	Upto 5	61.1	41.3	8.17	.004
	5-10	34.7	53.7		
	> 10	4.2	5.0		
Father's education	Illiterate	11.1	19.9	1.58	.208
	Upto 5th	41.7	35.6		
	HSc	20.8	25.6		
	> HSc	26.4	18.9		
Mother's education	Illiterate	22.2	48.4	17.49	.000
	Upto 5th	38.9	32.0		
	HSc	18.1	8.2		
	> HSc	20.9	11.4		
Mother's age at birth	<18	18.2	27.0	0.89	.345
	18-20	23.6	23.8		
	20-30	55.4	47.2		
	>30	2.8	2.0		

Table No. – 4 Demographic background of girls					
Variable	Option	count	%	Chi Value	P value
Size of home	Small	373	37.3	65.29	.000
	Medium	215	21.5		
	Big	410	41.0		
Type of home	Cemented	322	32.2	1.48	.215
	Mud	678	67.8		
Toilet at home	Yes	713	71.3	126.79	.000
	No	287	28.7		
Type of toilet	Open	340	34.0	181.47	.000
	Flush	549	54.9		
	Indian	110	11.0		
potable water	Tap	648	64.8	2.54	.758
	Tube well	352	35.2		

From the above table -4 it is clear that significant percentage (37.4%) of girls reside in small houses, and majority 67.7% of their houses are built of Mud (not cemented). Majority of them (71.4%) had toilet facility at their own home and majority toilets (77%) were of flush latrines but 13% of girls were bound to go out for natural courses and majority of them depend upon municipal supply for potable water.

Table – 5 Demographic background of the anemic and non anemic girls					
Variable	Option	Anemic	Non Anemic	Chi Value	P value
Size of home	Small	20.8	41.6	6.52	.011
	Medium	30.6	19.2		
	Big	48.6	39.1		
Type of home	Cemented	12.5	37.4	16.16	.000
	Mud	87.5	62.6		
Toilet at home	Yes	93.1	64.2	21.95	.000
	no	6.9	35.8		
Type of toilet	Open	6.0	15.7	0.12	.720
	Flush	94.0	70.3		
	indian	0.00	14.0		
Source of potable water	Tap	61.1	66.1	0.58	.445
	Tube well	38.9	33.9		

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As far as the association of demographic condition with the occurrence of anemia is concerned the above table clearly indicates that size of home, type of home and toilet facility at home had significant relation with the occurrence of anemia. More of the anemic girls had small and muddy homes with no inbuilt toilets. However type of toilet and source of potable water didn't make any significant difference on the occurrence of anemia in girls

Table – 6 Health status of girls

Variable	Option	count	%	Chi Value	P value
frequency of infection	rare	13	2.3%	1.383	.167
	frequent	222	41.9%		
	often	296	55.8%		
Type of infection	more than one	204	38.5%	1.441	.149
	cold & cough	216	40.8%		
	malaria	2	.4%		
	jaundic	42	7.9%		
	Seasonal fevers	6	1.1%		
	typhoid	10	1.9%		
	diarrhea	18	3.4%		
	other	32	6.0%		
History of Infestation	yes	128	24.2%	1.609	.108
	no	400	75.5%		
	not know	2	.4%		

The table clearly indicates a morbid health status of the girls as 41.9% girls had a history of frequent infections. Cold and cough (40.8%), jaundice (7.9%), diarrhea (3.4%) and more than one infection (38.5%) were the main ailments that occurred among them significantly. Besides these 24.2% girls has had a history of known worm infestation. The difference is not significant as per P value of the Chi tests indicate.

Table – 7 Health status of the anemic and non anemic adolescent girls

Variable	Option	non anemic	anemic	Chi Value	P value
frequency of infection	rare	1.6%	2.5%	.954	.329
	frequent	47.6%	40.1%		
	often	50.8%	57.4%		
Type of infection	more than one	36.5%	36.1%	1.037	.930
	cold & cough	47.6%	38.6%		
	malaria	3.2%	2.0%		
	jaundic	.00	.5%		
	Seasonal fevers	6.3%	8.4%		
	typhoid	.00	1.5%		
	diarrhea	1.6%	2.0%		
	other	4.8%	3.0%		
History of Infestation	yes	.00	7.9%	1.29	.256
	no	1.6%	3.0%		
	not know	22.2%	24.8%		

Further table 7 clearly indicates that none of the studied health factors found to occur in significantly different pattern among anemia and non anemic girls. Some of the infections were occurred more among anemic girls along with the known history of infestation but the difference is not significant as per P value of the Chi tests indicate.

Follwing The table - 8 reveals about some indicators of the reproductive health status of the adolescent girls. The table shows that majority (36.4%, 48.7%) had early and normal age of onset of menarche. Similarly, majority of them had (69.9%) moderate bleeding status with regular periods but the monthly occurrence of cycle in majority girls (81.1%) found delayed.

Table – 8 Menarchial status of the girls					
Variable	**Option**	**Count**	**%age**	**Chi Value**	**P value**
Age of onset (yr)	up to 12	172	36.4%	3.456	.001
	12 to 14	230	48.7%		
	14	70	14.8%		
Bleeding	Heavy	118	25.0%	2.309	.021
	Moderate	330	69.9%		
	Low	22	4.7%		
	Least	2	.4%		
Period status	regular	376	70.9%	1.150	.250
	irregular	154	29.0%		
Cycle	normal	18	4.8%	2.653	.008
	late	298	80.1%		
	earl	56	15.0%		

Table-9 menarchial status of the anemic and non anemic adolescent girls					
Variable	**Option**	**Anemic (%age)**	**Non anemic (%age)**	**Chi Value**	**P value**
Age of onset (yr)	upto 12	28.6%	39.3%	4.007	.045
	12to 14	49.2%	48.6%		
	14	22.2%	12.1%		
Bleeding	Heavy	17.5%	27.7%	2.660	.102
	Moderate	76.2%	67.6%		
	Low	4.8%	4.6%		
	Least	1.6%	.0%		
Period status	regular	60.3%	74.3%	3.511	.065
	irregular	39.7%	25.8%		
Cycle	normal	3.6%	5.4%	.659	.413
	late	78.6%	80.8%		
	earl	17.9%	13.9%		

From the above table it is clearly indicated that none of the studied menarchial factors showed significant association with the occurrence of anemia. Some of the indicators like early onset of menarche, early cycle and heavy bleeding were comparatively more frequent among anemic girls than their non anemic counterparts but the difference is not significant on the basis of respective P values.

Discussion: In the present study, the prevalence of anemia was found 72.2%. The prevalence of severe, moderate and mild anemia was found respectively among 2%, 34% and 36% girls. Many of the Indian studies revealed high occurrence of anemia among adolescents in there respective study areas [5] similar prevalence was reported by CMS Rawat et al [6] at Meerut. A higher prevalence was noted by J Rajaratnam et al [7] in Tamil Nadu. Toteja GS et al. [8]found 90.1% prevalence of anemia among adolescent girls from 16 districts of India, with 7.1% having severe anemia.

A significant association of the prevalence of anemia with educational status of parents reflects better awareness among literate mothers, as well as better socio-economic conditions. None of the subjects had severe anemia. Bulliyy *et al [9]* found 96.5% prevalence among non school going adolescent girls in three districts of Orissa, of which, 45.2%, 46.9%, and 4.4% had mild, moderate, and severe anemia. They found significant association between Hb concentration and the educational level of girls, their parents' family income, and body mass index. In the present study, mean height and mean weight of subjects with anemia was significantly less than subjects without anemia, which suggests that anemia affects the overall growth of adolescents.

S. Kauret. al. [10] indicated correlation of anemia with vegetarian diet, excessive menstrual bleeding, and iron intake and worm infestation. However age, status of menarche, BMI, education and socio-economic status did not found to contribute significantly.

Rajaratnam et al [7] documented a higher prevalence of anemia in girls who had attained menarche. Poor hemoglobin levels too can be a major cause of delayed menarche. Kotecha et al [11] and Mehta et al [12] also reported that age was not a significant correlate of anemia. Educational and socioeconomic status alone may not have any significant effect on anemia.

WHO/UNICEF [13] recommends that the problem of anemia is of very high magnitude in a community High prevalence of mild and moderate anemia, demands due emphasis so as to bring down total prevalence of anemia in adolescent girls. Family size and mother's education status, size of home, type of home and toilet facility at home showed significant association with the occurrence of anemia. The results of the study realized that with the improvement of socioeconomic conditions, providing proper medical care and attention, improving the nutritional status of mothers, can reduce anemia to a greater extent. A significant association of anemia with socio-economic status and parents' educational status suggests a need to develop strategies for intensive adult education and to improve the socio-economic status of the population through poverty alleviation programs. This should be supported by programs for the prevention of anemia among adolescent girls through nutrition education and anemia prophylaxis. This further reiterates and emphasizes the need for corrective measures for anemia and iron deficiency in girls before they enter adolescence so as to compensate the additional requirements for growth and development during puberty and combat the extra losses during menstruation.

Acknowledgement: The research work is a part of a field survey made under a UGC funded Major Research Project. Authors thank UGC to approve the project work and for grant funding.

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