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A Study of Anaemia Prevalence and Deworming Practices Among Adolescent Girls in Palani Block

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A B S T R A C T

According to World Health Organisation, adolescent girls are defined as the period of life spanning ages between 10-19 years. Compared to adolescent boys adolescent girls are at high risk of iron deficiency anaemia. National Family Health Survey-4 reports that about 51% of women aged 15-49 years anaemic in Dindigul District. The present study aims to assess the prevalence of anaemia in adolescent girls and to find the associated factors who are suffering from anaemia. A cross sectional study was conducted among 40 adolescent girls in Thiruvalluvar school from Palani Block, Dindigul District, Tamil Nadu. Structured close ended questionnaire was used to collect the data through Google forms. Data were coded in SPSS version 23. The overall prevalence rate of anaemia was found as 77.1%. Highly significant association $p<0.05$ was found between the problems during menstruation with anaemic status of the adolescent girls and the study also reveals that about 60% of the adolescent girls don't have deworming practices. Thus the study concludes that awareness should be created among the adolescent girls about nutritional anaemia and deworming practices in preventing the complications caused by anaemia and worm infestation.

Keywords: Adolescent girls, Anaemia, Prevalence, Deworming practices, Palani Block.

1. Introduction

Adolescence is the transition of a child to become an adult, during where there are increased physiological needs of iron due to the growth spurt, expansion of the lean body mass, total blood volume and the onset of menstruation [12]. World Health Organisation has defined adolescence as the period between 10-19 years of life. Adolescent girls constitute about 1/5th total female population in the world. Adolescence in girls has been recognized as a special period which signifies the transition from girlhood to womanhood. Menstruation is a phenomenon unique to all females. Women and girls of the reproductive age need access to clean and soft, absorbent sanitary products which can in the long run, protect their health [8].

Menstruation is a natural process but it is still a taboo in Indian society as it is considered unclean and dirty. Menstruation wastes are the wastes that are generated by a female in her reproductive years. These wastes are produced during menstruation commonly known as menses, periods, or monthly bleeding cycle. The menstrual cycle has three phases, that is, follicular phase (proliferative), ovulation phase, and luteal phase (secretory).Menstruation is regulated by hormones; in this process, endometrium, lining of uterus, gradually thickens and sheds off and causes bleeding that normally last for 3–5 days and occasionally up to 7 days. Menstruation sheds two-thirds of the endometrial lining. In addition to blood, menstrual fluid contains mucus and vaginal secretions. The menstrual flow varies from female to female and maybe more or less at the beginning of menses or may change throughout the cycle. The color of the menstrual fluid varies between red, bright red, and dark brown to black. The choice of absorbents varies among rural and urban women and girls. In rural areas, the most preferred absorbents are reusable cloth pads and in urban areas women prefer to use commercial sanitary pads [4].

Menstruating adolescent girls and women are regarded as an at-risk subpopulation by WHO. The monthly blood loss due to menstruation leads to rapid iron depletion, an essential compound of red blood cells. Similarly, the period of rapid growth, expansion of red cell mass and increased tissue requirements in adolescent girls lead to iron depletion [3].

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World Health Organization estimated that iron deficiency anaemia is a public health problem affecting two million people worldwide and more in developing countries like India (Reka, Vasantha Devi, & Thahira Banu, 2015). Studies have pointed out that iron requirements increased during adolescence, low bioavailability of iron from diets, infections, diseases and parasitic infestations cause iron loss. Apart from low haemoglobin count, there are other indicators of health which vary with nutritional status. The age of onset of menarche has also been found to vary according to nutritional status. As the nutritional status improves the age at menarche is lowered [10].

In particular, a persistently high level of anaemia among women in India (53% of all women have anaemia as per the National Family Health Survey 2015–20163) is of great concern, and the 2017 National Health Policy tabled by the Ministry of Health and Family Welfare, Government of India, acknowledges this high burden. Iron-deficiency anaemia (IDA) is a common problem among women, primarily due to their recurrent menstrual loss [9]. Deworming treatments aim to reduce the intensity of helminth infection, to protect infected individuals and prevent further transmission. Anthelminthic drugs differentially reduce worm burden and in turn can reduce the morbidity associated with STH. Cure rates are highest for roundworms, lower for hookworms and very low for whipworms [3].

UNICEF Report (2011) found that girls iron requirement increases dramatically to adolescents as a results of the expansion of the lean body mass , total blood volume, and the onset of menstruation , the changes make adolescent girls more susceptible to anemia , which has lasting negative consequences for them and for the survival, growth development of their children later in life to solve this problem the government of India introduced a anemia control programme for adolescent girls [1].

Our education sector plays an important role in child's growth and development by allowing them to respond to changes and challenges they are facing in day-to-day life. But many times it avoids issues related to the menstruation and menstrual hygiene management by considering it one's personal matter and should be discussed within the house. Menstruation is a silent issue in girl's life which is further affected by teacher's attitude, school environment, and infrastructure [4].

According to epidemiologic data from World Health Organization (WHO), 24.8% of the human population is currently suffering from anemia out of which a major portion is due to iron deficiency anemia. Hypochromic microcytic anemia is more common in premenopausal females because they lose blood with each menstrual cycle. Among the female population, almost 41% of all pregnant females suffer from anemia while among non pregnant pre-menopausal females 30% females are struggling with anemia [2]. This study was planned to highlight the prevalence rate of anaemia, menstrual problems according to their anaemia status and to find the deworming practices in adolescent girls.

1.2 Objectives of the study

- To assess the anaemia prevalence rate and deworming practices of the adolescent girls.
- To find out the association between socio demographic profile and menstruation problems of the adolescent girls.

2. Methodology

In the present study a cross sectional descriptive research design was carried out to find the prevalence rate of anaemia among adolescent girls. The study consists of 40 adolescent girls from Tiruvalluvar school which is located in Palani Block, Dindigul District, Tamil Nadu, India. Convenient sampling technique as used by the investigator to select the subject. The adolescent girls were selected at the age of 15-17 years and those who are under the treatment of anaemia and who are terminally ill are excluded from the study. Permission was obtained from District Educational Officer and Head Master for recruitment of study participants. Hemoglobin (Hb) estimation was recorded from the Primary Health Center of the Palani Block. The severity of anaemia was graded as per World Health Organisation which is shown in the table 2.1. Structured close ended questionnaire was used to assess the demographic profile and menstruation cycle problems of the adolescent girls. The data was collected through Google forms from the adolescent girls. Data was coded and analysed using SPSS version 23. Statistical analysis was done using percentage and chi square. Prevalence of anaemia and deworming practices was assessed by frequency and percentage. The association between the demographic profile and problems during menstruation of the adolescent girls was analysed by Chi square test. The level of significance was set at p value<0.05.

Table 2.1 The severity of anaemia is graded as per WHO classification

Grades of Anaemia	WHO
Normal	12gm/dl and above 12 gm/dl
Mild	10-11.9 gm/dl
Moderate	7-9.9 gm/dl
Severe	Below 7gm/dl

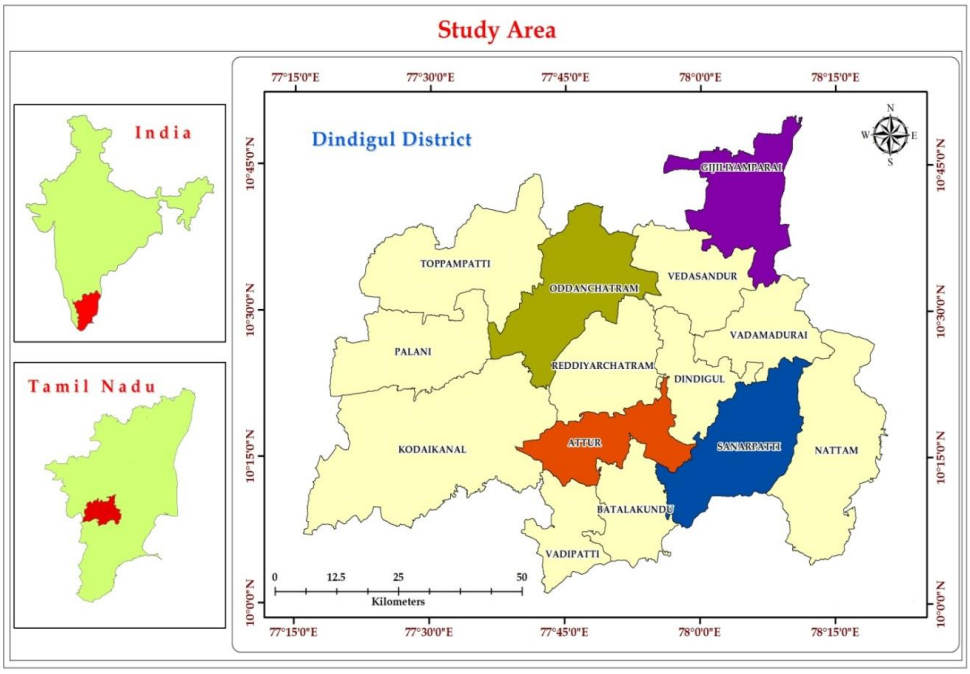

Figure 2.1 Study area

3. Results

Table 3.1 Anaemia prevalence of the adolescent girls

Hemoglobin level (g/dl%)	No.of students (N=40)	Percentage (%)
Normal/No anaemia	9	22.5
Mild anaemia(10.0-11.9)	17	42.5
Moderate anaemia(9.9-7.0)	13	32.5
Severe anemia (below 7.0)	1	2.1

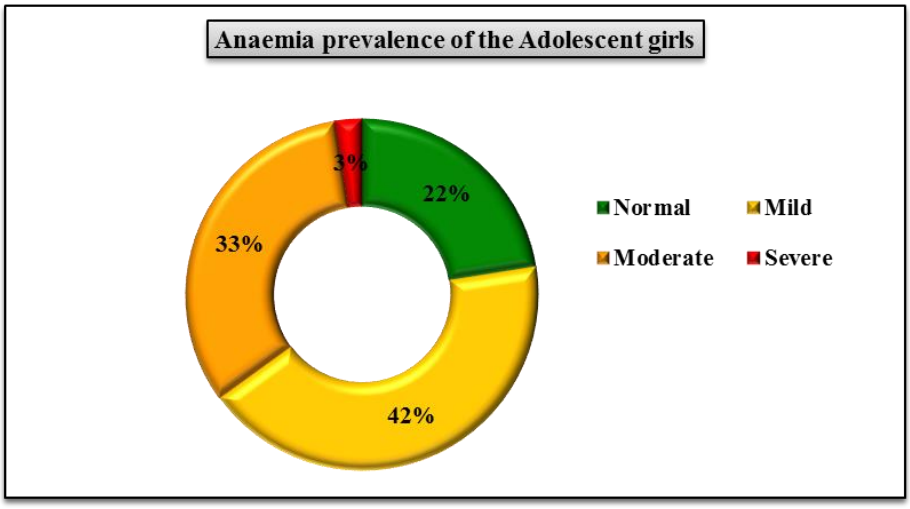

Figure 3.1 Anaemia prevalence of the Adolescent girls between 15-17 years

Table 3.2 Socio demographic characteristics of the adolescent girls according to their anaemic status

S.No	Aspect	Classification	Normal	Mild Anaemia	Moderate Anaemia	Severe Anaemia	Total	Percentage	χ^2	P value
1.	Residency	Urban	4	4	5	1	14	35.0	3.26	0.35**
		Rural	5	13	8	-	26	65.0		
2.	Educational status of the father	Primary	3	5	2	1	11	27.5	10.32	0.32**
		Secondary	3	2	4	-	9	22.5		
		Hr.Secondary	1	4	6	-	11	27.5		
		Degree	2	6	1	-	9	22.5		
3.	Educational status of the mother	Primary	5	6	4	1	16	40.0%	11.64	0.23**
		Secondary	2	1	6	-	9	22.5%		
		Hr.Secondary	2	7	2	-	11	27.0%		
		Degree	0	3	1	-	4	10.0%		
4.	Occupation of the father	Government employee	-	2	-	-	2	5.0%	10.75	0.55**
		Private organisation	3	5	4	-	12	30.0%		
		Business	3	2	2	1	7	17.5%		
		Coolie	3	3	3	-	10	25.0%		
		Farmer	-	5	4	-	9	22.5%		
5.	Occupation of the mother	Working women	8	7	5	1	21	52.5%	7.58	0.05*
		House wife	1	10	8	-	19	47.5%		
6.	Family income	Rs.3000/- 5000/-	-	-	1	1	2	5.0%	24.17	0.00*
		Rs.5001/-10000/-	4	10	10	-	24	60.%		
		Rs.10001/and above	5	7	2	-	14	35.0%		

[Key: *Statistically significant when the p value is $\leqslant$ 0.05, ** Non Significant, at 5%]

3.1 Residency

About 26(65%) of the subjects were from rural area and 14(32%) of the subjects were from urban area in the Palani Block. Majority of the adolescent girls 17(42.5%) were found that they are suffering from mild anaemic. On statistical analysis relationship between residency and anaemic status was found non-significant ($p>0.05$).

3.2 Educational status of the Parents

About 11(27.5%) of the respondents fathers educational status was Primary and Higher secondary education whereas 9(22.5%) of the respondents fathers educational status was Secondary education and Degree holders. Nearly 16(40%) of the respondents mothers educational status was Primary level, 11(27.5%) of them were Higher secondary, 9(22.5%) of them were Secondary and very few 4(10%) of the respondents mothers were degree holders. Majority of the adolescent girls educational level was Primary education 16(40%). On statistical analysis relationship educational status of the parents and anaemic status was found non-significant ($p>0.05$).

3.3 Occupational status of the Parents

Most of the respondents fathers are private organizers 12(30%), 10(25%) are coolie, 9(22.5%) are farmers, 7(17.5%) are business man and very few 2(5%) are government employees. 21(52.5%) of the respondents mothers are working women and 19(47.5%) are house wife. Chi square test between occupation of their father and anaemic status was found no significant ($p>0.05$) and the association between mothers occupation and the anaemic status of the adolescent girls was found significant ($p<0.05$).

3.4 Family income of the Parents

Family income adolescent girls was found between Rs.5001/- to Rs.10, 000/-. Only 5% of the families were living below the poverty line. Those who are in the bracket of above Rs.10, 000/- constituted 14(35%). It is clear that a subject from below poverty line suffers from severe anaemia. Relationship between family income of their parents and anaemic status of the adolescent girls was found statistically significant ($p<0.05$).

Table 3.3 Distribution of Adolescent Girls menstrual problems according to their anaemic status

S.No	Aspect	Classification	Normal	Mild Anaemia	Moderate Anaemia	Severe Anaemia	Total	Percentage	χ^2	P value
1.	Age of the respondents	15 years	1	8	8	-	17	42.5%	10.33	0.11**
		16 years	5	5	1	-	11	27.5%		
		17 years	3	4	4	1	12	30.0%		
2.	Age of menarche	10-12 years	4	7	-	-	11	27.5%	10.43	0.10**
		13-15 years	5	9	10	1	25	62.5%		
		16-18 years	-	1	3	-	4	10.0%		
3.	Menstrual cycle length	25-28 days	4	6	-	-	10	25.0%	11.36	0.07**
		28-30 days	3	9	8	1	20	50.0%		
		More than 30 days	2	2	5	-	10	25.0%		
4.	Duration of flow	< 3 days	-	3	5	-	8	20.0%	9.61	0.38**
		3-5 days	5	6	2	1	14	35.0%		
		5-7 days	3	6	3	-	12	30.0%		
		>7 days	1	2	3	-	6	15.0%		
5.	Regularity of menstruation	Regular	6	11	4	1	22	55.0%	5.04	0.16**
		Irregular	3	6	9	-	18	45.0%		
6.	Absorbents used	Old cloth	4	7	3	-	14	35.0%	11.70	0.06**
		New cotton cloth	-	5	-	-	5	12.5%		
		Sanitary napkin	5	5	10	1	21	52.5%		
7.	Problems during menstruation	Dysmenorrhea	4	9	-	-	13	32.5%	29.41	0.00*
		Abdominal pain	3	-	7	-	10	25.0%		
		Body pain	2	-	3	-	5	12.5%		
		Back pain	-	5	3	1	9	22.5%		
		Breast tenderness	-	3	-	-	3	7.5%		
8.	Deworming practice	Yes	6	7	1	1	15	37.5%	9.96	0.01*
		No	3	10	12	-	25	62.5%		

[Key: *Statistically significant when the p value is $\leqslant$ 0.05, ** Non Significant, at 5%]

3.5 Age of the respondents

Out of total respondents 17(42.5%) of them were in the age group of 15 years, 12(30%) of them were in the age group of 17 years and 11(27.5%) of them were in the age group of 16 years. Majority of the adolescent girls from the age group of 15 years suffer from anaemia. Relationship between age of the adolescent girls and anaemic status was found statistically non significant (p>0.05).

3.6 Age of menarche

Majority 25(62.5%) of the adolescent girls attained menarche at their age of 13-15 years. About 11(27.5%) of the adolescent girls attained menarche at their age of 10-12 years. 4(10.0%) of the adolescent girls attained menarche in the age group of 16-18 years. Association between age of menarche and anaemic status was found statistically non significant (p>0.05).

3.7 Menstrual cycle length

Majority 20(50.0%) of the adolescent girls menstrual cycle length was between 28-30 days. Nearly 10(25.0%) of the adolescent girls menstrual cycle length was between 25-28 days and more than 30 days. The relationship between the menstrual cycle length and anaemic status was found non significant (p>0.05).

3.8 Duration of flow

Majority 14(35.0%) of the adolescent girls duration of the flow is between 3-5 days. About 12(30.0%) of the adolescent girls duration of the menstrual flow is between 5-7 days. Nearly 8(20.0%) of the adolescent girls menstrual duration flow is less than three days and 6(15.0%) is more than seven days. Association between the duration of the flow and anaemic status was observed statistically non-significant (p>0.05).

3.9 Regularity of the menstruation cycle

Nearly 22(55.0%) of the adolescent girls are regular in their menstruation cycle and rest 18(45.0%) are irregular in their menstruation cycle. Statistically non-significant (p>0.05) association was found between regularity of menstruation cycle and the anaemic status of the adolescent girls.

3.10 Absorbents used

Out of 40 adolescent girls 21(52.5%) use sanitary napkins, 14(35.0%) use old cloths and very few use 5(12.5%) new cotton cloths. Statistically non significant ($p>0.05$) association was observed between absorbents used by the adolescent girls and the anaemic status of the adolescent girls.

3.11 Problems during menstruation

About 13(32.5%) of the adolescent girls have dymenorrhea during menstruation. 10(25.0%) have abdominal pain, followed by back pain 9(22.5%). Only few suffering from body pain 5(12.5%) and breast tenderness 3(7.5%) respectively. Highly significant ($p<0.05$) association was found between the problems during the menstruation and anaemic status of the adolescent girls.

3.12 Deworming practices

Only 15(37.5%) of the girls out of 40 reported that they practice deworming. Majority of them 25(62.5%) reported that they don't have the practice of deworming. Statistically significant ($p<0.05$) association was observed between deworming practices and the anaemic status of the adolescent girls from the selected school.

Table 3.4 Method of deworming practices of the adolescent girls

Deworming practices	No. of students (N=40)	Percentage (%)
Private hospital	5	12.5
Government hospital	3	7.5
Home remedies	8	20.0
No deworming practices	24	60.0

Table 3.4 and Figure 3.2 reveals that out of 40 adolescent girls 5(12.5%) consulted private practitioners, 3(7.5%) attended government hospital, 8(20.0%) did home remedies and the rest 24(60.0%) have no deworming practices.

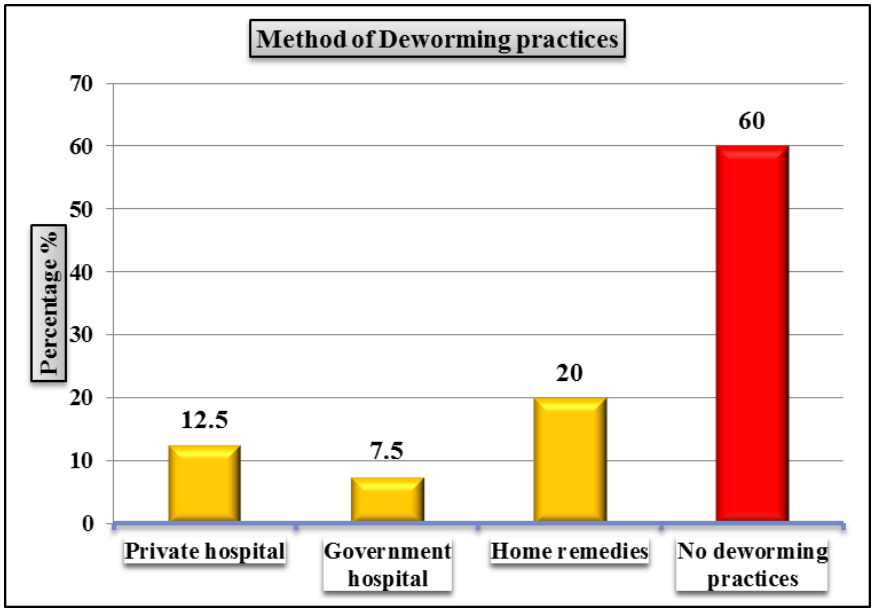

Figure 3.2 Method of Deworming practices among adolescent girls

4. Discussion

The present study was conducted in the Government school which is located in Palani Block. The overall prevalence rate of anaemia was found as 77.1%. In this study significant association was found with occupation and family income of the anaemic status of the adolescent girls. Majority of the adolescent girls 42.5% have mild anaemia and 2.1% have severe anaemia. Occupation of the parents and income level are the reasons associated among girls suffering with mild anaemic. Highly significant $p<0.05$ association was found between the problems during the menstruation and anaemic status among them. Deworming practices was also observed statistically significant with the adolescent girls. Table 4 shows that about 60% of the adolescent girls don't

have the deworming practices. This worm formation leads to anaemia and crop up problems in menstruation flow, duration and cycle. The rest of the factors like residency, educational status, followed by age of menarche, menstrual cycle length, flow, regularity, absorbents used are found as non significant p>0.05. The main schemes to combat anaemia are as follows.

4.1 Important schemes to combat Anaemia

The Government of India (GOI) initiated the National Nutritional Anaemia Prophylaxis Programme (NNAPP) in 1970, wherein iron and folic acid (IFA) tablets were supplied to under-five children and pregnant women. However, no significant improvement was found in anaemia in the evaluation during 1985-86.10 The GOI later launched another programme called "12 by 12 initiative" addressing the problem of anaemia in adolescents, in collaboration with WHO and UNICEF, Federation of Obstetrics and Gynaecological Society of India. The programme is aimed to achieve haemoglobin levels of 12 g% by the age of 12 years by 2012. Under Rajiv Gandhi Scheme for Adolescent Girls-SABALA programme initiated in 2011, AGs are being received weekly supplementation of IFA tablets and biannual deworming (Albendazole) tablets. Despite all these programmes, the prevalence of anaemia among women and AGs is alarming [12].

4.2 Integrated Child Development Services (ICDS)

A special intervention for adolescent girls using the Integrated Child Development Scheme (ICDS) was put into operation from November 1991. It aims to break the cycle of nutritional and gender disadvantage to provide a supportive atmosphere for self development. All unmarried adolescent girls (11–18 years) whose family's income is below Rs. 6400 per annum in the rural areas are the beneficiaries of the program. Services provided are educational activities through non formal and functioned literacy pattern, immunization, general health checkup every 6 months, treatment for minor ailments, deworming, prophylaxis measures against anemia, goiter, vitamin deficiencies, etc., referral to public health center (PHC)/district hospital in the case of acute need, and convergence with Reproductive Child Health Scheme.

4.3 Rashtriya Kishor Swasthya Karyakram

The Ministry of Health and Family Welfare launched Rashtriya Kishor Swasthya Karyakram on January 7, 2014 for adolescents (10–19 years) with an objective to focus more on continuum of care for adolescent health and developmental needs. The main strategies are community based interventions, facility based interventions, and social and behavior change communication with focus on interpersonal communication [5].

5. Conclusion

National anaemia is a major public health problem in India. This is primarily due to insufficient intake of iron rich foods and deworming practices. Family income and educational status of the parents are the major factors of anaemia. Proper knowledge concerning iron rich foods, supplementation, deworming practices during puberty to be given. Awareness regarding Iron and folic acid supplementation in pubertal girls builds up the iron stores in them and when addressed them who soon enter married life and motherhood, could be just a proper solution to problem of anemia in pregnant women can be attempted forming a bedrock platform in the concept of continuum of care [11]. National Deworming Day is an initiative to help the child; adolescent girls live healthy and help in reducing morbidity. Health problem in adolescent girls are different from the younger children and older adults. They are more likely a victim because of limited resources. Hence their health in of utmost importance as they are the future generation who will build nation and the world at large. Good reproductive health really begins in adolescence [6].

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