

Assessment of the Prevalence of Menstrual Complications with Knowledge, Attitude and Practice Regarding Menstruation of Rural Girls in Jashore, Bangladesh

Mst. Sharmin Sultana¹, Arafat Hassan Razon¹, Mohammad Tanvir Sarwar², Tanvir Ahmad^{1, *}

¹Department of Nutrition and Food Technology, Jashore University of Science and Technology, Jashore, Bangladesh

²Department of Applied Nutrition and Food Technology, Islamic University Kushtia, Kushtia, Bangladesh

Email address:

fmtanvir@gmail.com (T. Ahmad), fmtanvir_nft@just.edu.bd (T. Ahmad)

*Corresponding author

To cite this article:

Mst. Sharmin Sultana, Arafat Hassan Razon, Mohammad Tanvir Sarwar, Tanvir Ahmad. Assessment of the Prevalence of Menstrual Complications with Knowledge, Attitude and Practice Regarding Menstruation of Rural Girls in Jashore, Bangladesh. *Science Journal of Public Health*. Vol. 9, No. 5, 2021, pp. 162-168. doi: 10.11648/j.sjph.20210905.14

Received: August 11, 2021; **Accepted:** August 24, 2021; **Published:** September 16, 2021

Abstract: Context: Menstruation is one of the most basic characteristic features of girls and inadequate knowledge of adolescent girls about menstruation can result in faulty menstrual hygiene management (MHM) and inappropriate dietary management both of these can cause diseases which is a major threat for adolescent health in developing countries like Bangladesh. Aim: To identify current knowledge, attitudes, and practices related to menstruation and menstrual hygiene management (MHM) among adolescent girls. Settings and Design: It is a descriptive cross-sectional study conducted in Jashore, Bangladesh. Methods and Materials: A pre-formed, pre-tested questionnaire was used. The questionnaire-based survey was conducted among randomly selected 250 adolescent girls between 10 and 19 years. Statistical analysis used: Data were analyzed statistically by Microsoft office excels and SPSS windows version 16 software programs. Results: Among 250 adolescent girls majority had their menarche between 12 and 15 years of age, 70% of adolescent girls of this study belonged to lower class families. This study revealed that 85% of the respondents had regular menstruation whereas 15% had irregular menstruations also. Most of them faced different types of Premenstrual syndrome including 76% from headache, 80% from lower abdominal pain, and 62.5% from fatigue and weakness. Only 56% had previous knowledge about puberty before attaining menarche. There was a statistically significant correlation between the mother's education and the knowledge of participants about menstruation at puberty. All the participants used to bath and wash hand after changing pads whereas 80.8% used to avoid all types of exercises. Almost 94% of respondents used to dispose of their napkins properly. The micro-nutrient deficiency was also common; especially 49.2% were suffering from Iron deficiency and 69.6% from folic acids deficiency. Conclusion: Awareness programs regarding both menstrual hygiene and dietary management can aid to alleviate some complications during puberty and ensure better health for adolescent girls.

Keywords: Menstruation, Deficiency Disease, Menarche, Adolescent

1. Introduction

Menstruation can be defined as the cyclical bleeding which is occurred in women at the time of their reproductive age. The main reason for menstruation is the endometrial shedding at regular intervals. It is defined as the common process among women during their reproductive age and it happens during the time when ovum fertilization does not take place [1]. The menstrual cycle may be defined as the

cyclical psychological changes that occur in females and it is an indicator of women's reproductive age [2, 3]. The very first menstruation that is occurred in a women's life is called menarche and it is used as an indicator to identify the development of puberty in females [4, 5]. Menarche is related to the age during the time of puberty and breast development. In girls, due to the earlier breast development, the interval to menarche is longer than in girls who have a later onset of breast development [6, 7]. It was evident that

menarche can occur in females between 12 and 13 years of age. The menarche age of 12.8 in white American girls has not changed in 50 years. In most countries, early menarche has been noted in urban girls than in rural girls [8-10]. The incidence of menarche has been increased throughout the United States from the early 1800s to the mid-1950s and during the last 40 to 50 years this incidence rate has not been declined. Among the other developed urban populations, similar findings have also been seen in international studies [11]. Variations in the age of menarche have been observed globally and mostly in the less developed countries; for example, the mean age of menarche is 15.37 years [12, 13]. The menstrual cycle during the adolescent period is usually irregular but it usually becomes regular with time [5]. The transformation from girlhood to womanhood is defined as the adolescence period and it is recognized as a special period time in women's life [14]. Menarche is recognized as the most vital event in the life of an adolescent girl [15]. Most of the time menarche provides a very negative effect on girl's minds. It is usually a matter of fear for them and most often they are ashamed to talk about it [14]. During the menstrual period, several restrictions have been observed to be imposed on women such as not being allowed to take bath, changes clothes, comb hair and enter holy places, and dietary restrictions (taboo on the consumption of food like rice, curd, milk, potato, etc [16]. Adolescence is also defined as a healthy period of life but within this time period women are not properly informed about the reproductive information and services and as a result, this leads to inadequate information regarding menarche among females [17]. There is a culture to remain silent regarding the topic of menstruation and its related issues in most parts of the developing countries and as a result, most adolescent girls are not properly informed about menstrual hygiene. Due to poor personal hygiene and unsafe sanitary conditions, many types of gynecological problems are being faced by young girls [18, 19]. Taboos and socio-cultural restrictions are the main factors that hamper menstruation and its practices. As a result, adolescent girls are still remaining ignorant of the scientific facts and hygienic health practices of menstruation which produces harmful health outcomes among young girls [18]. This study will help to assess the knowledge and practices of menstrual hygiene and also it will try to provide appropriate information about menstruation, use of sanitary napkins, cloth and their disposal, MHM (Menstrual Hygiene Management), and dietary habits during menstruation. So the major purpose of our study is to identify current knowledge, attitudes, and practices related to menstruation and MHM among adolescent girls as well as suggest possible solutions.

2. Subjects and Methods

Study design: A cross-sectional descriptive study was conducted in the Jashore district among school-going, adolescent girls. A close-ended questionnaire was made to collect data from adolescent girls. The questionnaire-based survey was conducted among adolescent girls between 10

and 19 years.

Sample size: A total number of 250 adolescent school-going girls between 10 and 19 years were selected for the research.

Study location: The study was conducted in different schools in Jashore city. Data were collected from adolescent girls of Burujbagan girls school, Gatipara high school, Sharsha govt. high school, Akij school, and college, Momin girls school, and Jhikorgachasommiloni school, Jashore, Bangladesh.

Sampling technique: In this study, the data was collected by following a simple random sampling method. The data was collected regularly until the targeted sample size was obtained.

Questionnaire: A standard questionnaire was developed to collect data from the respondents. The questionnaire contained questions regarding family history, socio-economic status, complications with knowledge, attitude, and practice regarding menstruation and diseases information. The Clinical assessment is used to identify nutritional deficiencies. The questionnaire was prepared in the local language as well as in English. The questionnaire also contained multiple-choice questions.

Data collection procedures and techniques: During the period of data collection, the data were collected daily. The data were collected from the school-going girls on a random basis. Anthropometric measurements such as height and weight were taken by height scale and weight machine.

Ethics: The study was conducted maintaining all kinds of ethical considerations. Relevant permissions were taken from the schools. Informed consent of each of the adolescent girls was obtained before data collection by explaining the purpose and methods of the study, risks, and benefits of participation in the study.

Quality control: After collecting data, the questionnaire was checked to identify any discrepancy in information quality. Then completed data were included.

Data analysis: The data from finally checked questionnaires were entered into the Statistical Package for Social Science (SPSS) windows version 16 software program and data entries were carefully done to avoid the error.

Study period: The study was carried out from July 2018 to January 2019 which included study design, questionnaire preparation, literature review, data collection, data analysis, and written up.

3. Results

The study was carried out in girl's schools of Jashore, Bangladesh. About 250 school-going girls were targeted initially for collecting data. Girl students fully cooperated with this research. Table 1 illustrates the age of adolescent girls based on attaining menarche. From this table, we noticed that 11.6% of the adolescent girls had their menarche at the age of between 16 and 19 years but the majority of our respondents had their menarche between 12 and 15 years of age.

Table 1. Age distribution of adolescent girls attaining menarche.

Age	Frequency	Percent (%)
11	10	4
12	35	14
13	60	24
14	74	29.6
15	42	16.8
16	11	4.4
17	9	3.6
18	5	2
19	4	1.6
Total	250	100

We asked the adolescent girls about their parent's education, occupation, and family status as it may affect their menstruation. From the analysis of their data, we discovered that majority of their mothers were illiterate which was about

60.8% and 50% of their fathers were jobholders. We surprisingly noticed that majority of our respondents which was about 70% belonged to lower class families. And we illustrate all this information in table 2.

Table 2. Mother's education, Father's occupation, and Family status of studied adolescent girls.

		Frequency	Percentage (%)	Total (%)
Mother's education	Literate	98	39.2	100
	Illiterate	152	60.8	
Father's occupation	Farmer	50	20	100
	Job holder	125	50	
	Businessman	75	30	
Family status	Lower class	175	70	100
	Middle class	67	26.8	
	Higher class	8	3.2	

Table 3 shows the correlation between the mother's education and the knowledge of participants about menstruation on the puberty. There was a significant correlation between a mother's education and Knowledge about menstruation on puberty. Because correlation was significant at the 0.01 level (2-tailed). Here p-value was .000.

Table 3. Correlation between mother's education and Knowledge about menstruation on puberty.

		Knowledge about menstruation on the puberty		Total	P value
		Yes	No		
Mother's education	Illiterate	65	87	152	.000
	Literate	74	24	98	
Total		139	111	250	

Table 4 represents the persons who informed the girls about menstruation. Here we found that adolescent girls were informed mostly by their sister and mother which were 29.6% and 28% respectively.

Table 4. Persons who informed the girls about menstruation.

Persons	Frequency	Percentage (%)
Mother	70	28
Teacher	23	9.2
Sister	74	29.6
Friends	31	12.4
Magazines and newspaper	5	2
Television	10	4
Internet	7	2.8
Other	30	12

Table 5 illustrates the categories of menstruation among adolescent girls. From that table, we came to know that majority of our respondents had regular menstruation which was about 85% of our respondents.

Table 5. Menstruation categorizes among adolescent girls.

	Level	Frequency	Percentage (%)	Total (%)
Menstruation flow categorize	Mild	35	14	100
	Moderate	200	80	
	Heavy	15	6	
	Only spotting	0	0	
Menstruation categorize	Regular	213	85	100
	Irregular	37	15	

The usage of menstrual materials is an important issue during menstruation because it impacts on health and activities of adolescent girls. So we interpret a correlation between the usage of napkins or cloths during menstruation

with father's occupation through table 6. From that table, we observed that there was no statistically significant correlation between menstrual absorbent and father's occupation.

Table 6. Correlation between menstrual absorbent and father's occupation.

Menstrual absorbent	Frequency	Percentage (%)	Father's occupation	P value
Sanitary towel	56	22.5	Farmer (20%)	.326
Sanitary napkins	115	46	Job holder (50%)	
Tampons	25	10	Businessman (30%)	
Clothes	45	18		
Any other	9	3.6		
Total	250	100		

Table 7 interprets the knowledge about menarche on puberty among adolescent girls. We surprisingly noticed that 44% of our respondents had no previous knowledge about menarche.

Table 7. Knowledge about menarche on puberty.

Knowledge about menstruation on the puberty before menstruation		
	Frequency	Percent (%)
Yes	140	56.0
No	110	44.0
Total	250	100.0

Table 8 demonstrates the symptoms of premenstrual syndromes among adolescent girls. We noticed that premenstrual syndrome varies from girl to girl. Among various premenstrual syndromes, we found that 80% of our

respondents had lower abdominal pain and 76% had a headache. Fatigue and weakness were also common complications.

Table 8. Premenstrual syndrome (PMS) symptoms among adolescent girls.

PMS	Frequency	Percent (%)
Headache	190	76
Backache	95	38
Lower abdominal pain	200	80
Fatigue and weakness	157	62.8
Mood swings	130	52
Any other	20	8

Table 9 represents that 100% of respondents took their baths daily and washed their hands after changing pads and undergarments. But majority percent of our respondents did not perform any form of exercise during menstruation which

was almost 81%. About 93.2% of our respondents disposed of their napkins properly which was an indication of good hygiene practice.

Table 9. Awareness level related to menstruation.

		Frequency	Percent (%)	Total (%)
Avoid any foods	Yes	28	11.2%	100
	No	222	88.8%	
Daily bathing	Yes	250	100%	100
	No	0	0	
Hand washing after changing	Yes	250	100%	100
	No	0	0	
Exercise	Yes	48	19.2%	100
	No	202	80.8%	

		Frequency	Percent (%)	Total (%)
Change undergarments daily	Yes	250	100%	100
	No	0		
Eating specific food during the period	Yes	135	54%	100
	No	115	46%	
Eat separately from family members	Yes	0	0	100
	No	250	100%	
Disposing napkins properly	Yes	233	93.2%	100
	No	17	6.8%	
Use drug or medicine to alleviate pain	Yes	56	22.4%	100
	No	194	77.6%	

Table 10 describes the knowledge about the diet, prevention, and management of anemia among adolescent girls. We noticed that only 22.8% of our respondents had knowledge about diet, prevention, and management of anemia.

Table 10. Knowledge about diet, prevention, and management of anemia.

Knowledge about anemia	Frequency	Percentage (%)	Total (%)
Yes	57	22.8	100
No	193	77.2	

Table 11 shows the deficiency diseases among adolescent girls attaining menarche. We noticed that majority of our respondents had iron and folic acid deficiency which was almost 50% and 31% respectively.

Table 11. Deficiency diseases among adolescent girls.

Diseases		Frequency	Percentage (%)	Total (%)
Iron deficiency	Yes	123	49.2	100
	No	127	50.8	
Zinc deficiency	Yes	50	20	100
	No	200	80	
Folic acid deficiency	Yes	76	30.4	100
	No	174	69.6	
Vitamin B deficiency	Yes	33	13.2	100
	No	217	86.8	

4. Discussion

The present study is designed to demonstrate the knowledge, perception, and practices regarding menstruation among adolescent girls. In our study, the majority of our respondents had their menarche between 12 and 15 years of age. On the other hand, a study in Spain demonstrated that the mean age of menarche in their total sample was 12.62 ± 0.06 years [6]. Which is very much consistent with our study result. Another study conducted in Jammu and Kashmir among adolescent girls found a different age range of menarche from ours and they found that majority of their respondents had menarche between 10 and 12 years of age [16]. So we can say that menarche can be regularly started at the age of 12 among adolescent girls. According to our study majority of our respondent's mothers were illiterate as well as the majority of them belonged to a lower-class family which may be one of the major causes for poor menstrual management. Our findings also show a significant correlation between mother's education and knowledge about menstruation on the puberty of our respondents. A study in Bangalore shows similar findings with our study where the majority of the respondent's mothers were illiterate [18]. Another study in Northern Sudan among Sudanese girls who had between 13 to 18 years of age described that majority of their respondent's mothers had the elementary level of

education and most of them belonged to medium-income families. This study also found that the parent's educational level of adolescent girls, as well as family income level, was highly correlated with the age of menarche [20]. Our study result was not consistent with this study which was conducted in Sudan. Ideally, it is the responsibility of the mother to make their daughters aware of menstruation even before they could attain menarche. Regarding the source of information about menstruation majority of the studied girls of our study reported that their sister and mother were the main sources of information about menstruation. Our results are in line with what is reported from South Africa [21]. Though menstruation is an uncomfortable topic for adolescent girls to discuss; mothers and sisters should play a significant role in conveying information about physiological changes and also about social, emotional, and cultural issues. However, the menstrual-related information from mothers and sisters is not reliable because they are not properly equipped to fill the gaps in girl's knowledge [22]. To handle menstruation-related issues it is very important for the girls to get appropriate and reliable information regarding menstruation. Thus, it is very important to assess and correct the menstrual-related information among mothers and sisters and it should be a matter of concern among health care professionals and local support groups. About 80% of our respondents had moderate menstrual flow and the majority of them had regular menstruation. So there was a normal

menstrual cycle among our study population. A study among adolescent girls in Jammu and Kashmir also showed almost similar findings to ours. Their study stated that the majority of their respondents (70.2%) had a menstrual cycle between 30 to 45 days which was a normal menstrual period among their population [16]. The minority of our respondents used cloths as menstrual absorbents but the majority of our respondents used sanitary napkins as a menstrual absorbent which is an indication of good menstrual behavior practices. The situation is due to the socio-economic conditions of most adolescent girls, as their fathers are employed and can afford sanitary napkins. A study in South Africa among adolescent females demonstrates a different result from ours. Because a minority of their adolescent females (37%) were reported to be using sanitary pads but the majority (55%) used cloths. They mentioned that the situation was due to the socio-economic conditions of most respondents, as their parents were unemployed [21]. A large portion of our study population still remained unaware of the menstrual knowledge which is totally supported by a study conducted in Tirupati, Andhra Pradesh, India. Where the study described that only one in seven adolescent girls had knowledge about menses which was defined as very poor knowledge about menarche among their study population like ours [23]. Our respondents reported some premenstrual discomforts and the majority of our study population reported that they had a headache and lower abdominal pain. Even some discomforts can be experienced by healthy women during periods. However, the result of our study regarding menstrual discomfort was matched with a study conducted in Kerala, India [24]. Another study in Meghalaya reported that the majority of their adolescent participants had awareness about lower abdominal pain and backache during their period [15]. We noticed that all the adolescent girls of our study took baths daily and washed their hands after changing their pads. As well as we also noticed that majority of our respondents disposed of their napkins properly. All these behaviors indicate good menstrual practices. However, another study conducted in rural Bangladesh showed a totally different situation from ours. The study showed that only 9% of girls in their study used sanitary pads and 45% of their study population buried their used materials under the soil as well as 11% of their respondents threw pads and other clothes in the canal. The findings showed poor menstrual behavior as well as less environmentally friendly methods of menstrual materials disposal [25]. As a minority of our study population had knowledge about the diet, prevention, and management of anemia majority of them suffered from iron and folic acid deficiency. A study in Ethiopia among school adolescent girls showed almost similar results to us. Their study discovered that majority of their respondents about 61.7% had poor knowledge about the cause of anemia, 61.5% had poor knowledge about the prevention of anemia and 56.7% had overall poor knowledge about anemia [26]. Iron deficiency anemia in girls limits their development, learning ability, reduces concentration in daily tasks, increases their vulnerability to infection, increases school dropout rates, reduces physical fitness and work productivity. Primary

prevention of anemia may be achieved through a well-balanced diet rich in iron and other vitamins and minerals involved in iron absorption or in the production of Hemoglobin.

5. Conclusion

This cross-sectional study reveals that the majority of adolescent girls usually got menstrual information from their mother and sister. Most of them had proper menstrual hygiene behavior as well as proper menstrual hygiene management knowledge where clean toilets, adequate water, and safe dispensation of pads is still a dream for the majority of school girls even in this day and age. In some regions of my study, many myths and restrictions about menstruation obstructed my work. It is hereby recommended that the government or non-government organizations should provide financial assistance and other necessary facilities for helpless adolescent girls. And also should ensure enough health care providers in every hospital or clinic to give information about menstruation among adolescent girls. Further studies may be carried out to ensure knowledge, attitude, and practice of menstruation among adolescent girls.

Conflict of Interest Statement

All the authors do not have any possible conflicts of interest.

Ethical Approval

The Ethical Review Committee, Faculty of Biological Science and Technology, Jashore University of Science and Technology Jashore, Bangladesh ruled that no formal ethics approval was required in this case.

Supplemental Material

Data can be provided on request.

Acknowledgements

We would like to thank our supervisor Tanvir Ahmad for his valuable advice and guidance during the study.

References

- [1] Gómez-Sánchez PI, Mora YYP-, Hernández-Aguirre HP, Jiménez-Robayo SP, Pardo-Lugo JC. Menstruation in history. *Investig y Educ en Enfermería* [Internet]. 2012; 30 (3): 371–377. Available from: <http://www.redalyc.org/resumen.oa?id=105224976009>.
- [2] Harlow SD, Campbell OMR. Epidemiology of menstrual disorders in developing countries: A systematic review. *BJOG An Int J Obstet Gynaecol*. 2004; 111 (1): 6–16. PMID: 14687045.

- [3] Strassmann BI. of B JOLOGY REVIEW. Rev Lit Arts Am. 2011; 71 (2): 181–220.
- [4] Cameron N, Nagdee I. Menarcheal age in two generations of South African Indians. *Ann Hum Biol.* 1996; 23 (2): 113–119.
- [5] Hillard PJA. Menstruation in Young Girls. *Obstet Gynecol.* 2002; 99 (4): 655–662.
- [6] Marti-Henneberg C, Vizmanos B. The duration of puberty in girls is related to the timing of its onset. *J Pediatr.* 1997; 131 (4): 618–621.
- [7] Llop-Viñolas D, Vizmanos B, Closa Monasterolo R, Escribano Subías J, Fernández-Ballart JD, Marti-Henneberg C. Onset of puberty at eight years of age in girls determines a specific tempo of puberty but does not affect adult height. *Acta Paediatr Int J Paediatr.* 2004; 93 (7): 874–879.
- [8] Amaza D. Menstrual Pattern among Female Medical Students in University of Maiduguri, Nigeria. *Br J Med Med Res.* 2012; 2 (3): 327–337.
- [9] Herman-Giddens ME, Slora EJ, Wasserman RC, Bourdony CJ, Bhapkar M V., Koch GG, et al. Secondary sexual characteristics and menses in young girls seen in office practice: A study from the pediatric research in office settings network. *Pediatrics.* 1997; 99 (4): 505–512.
- [10] Flug D, Largo RH, Prader A. Menstrual patterns in adolescent swiss girls: A longitudinal study. *Ann Hum Biol.* 1984; 11 (6): 495–508. PMID: 6524865.
- [11] Grace WYSHAK, Rose E. FRISCH. Evidence for a secular trend in age of menarche. *New Engl Mournal Med.* 1951; 244 (6): 209–213.
- [12] Thomas F, Renaud F, Benefice E, De Meeüs T, Guegan JF. International variability of ages at menarche and menopause: Patterns and main determinants. *Hum Biol.* 2001; 73 (2): 271–290. PMID: 11446429.
- [13] Barnes-Josiah D, Augustin A. Secular trend in the age at menarche in Haiti. *Am J Hum Biol.* 1995; 7 (3): 357–362.
- [14] Sapkota D, Sharma D, Budhathoki S, Khanal V, Pokharel H. school going adolescents of rural Nepal. *J Kathmandu Med Coll.* 2013; 2 (5): 122–128.
- [15] Nagar S, Aimol KR. Knowledge of Adolescent Girls Regarding Menstruation in Tribal Areas of Meghalaya. *Stud Tribes Tribals.* 2010; 8 (1): 27–30.
- [16] Dhingra R, Kumar A, Kour M. Knowledge and practices related to menstruation among Tribal (Gujjar) adolescent girls. *Stud Ethno-Medicine.* 2009; 3 (1): 43–48.
- [17] Lawan UM, Yusuf NW, Musa AB. Menstruation and menstrual hygiene amongst adolescent school girls in Kano, Northwestern Nigeria. *Afr J Reprod Health.* 2010; 14 (3): 201–207. PMID: 21495614.
- [18] Shanbhag D, Shilpa R, D’Souza N, Josephine P, Singh J, Goud BR. Perceptions regarding menstruation and practices during menstrual cycles among high school going adolescent girls in resource limited settings around Bangalore city, Karnataka, India. *Int J Collab Res Intern Med Public Heal.* 2012; 4 (7): 1353–1362.
- [19] Ughade SN. Menstrual Hygiene: Knowledge and Practice among Adolescent School Girls of Saoner, Nagpur District. 2015; (January).
- [20] Saeed M, Mohammed A. Influence of Socioeconomic Status in the Age at Menarche and Duration of Menstrual Bleeding. *Mater Socio Medica.* 2011; 23 (4): 195.
- [21] Ramathuba DU. Menstrual knowledge and practices of female adolescents in Vhembe district, Limpopo Province, South Africa. *Curationis.* 2015; 38 (1): 1–6.
- [22] Chandra-Mouli V, Patel SV. Mapping the knowledge and understanding of menarche, menstrual hygiene and menstrual health among adolescent girls in low- and middle-income countries. *Reprod Health. Reproductive Health;* 2017; 14 (1): 1–16.
- [23] Reddy PJ, Rani DU, Reddy GB, Reddy KK. Reproductive health constraints of adolescent school girls. *Indian J Soc Work.* 2005; 66 (4): 431–442.
- [24] Kamalam KJ, Rajalakshmi B. Reproductive health awareness among college-going girls. *Indian J Soc Work.* 2005; 66 (4): 415–430.
- [25] Mondal B, Ali M, Dewan T, Tasnim T. Practices and effects of menstrual hygiene management in rural Bangladesh. 40th WEDC Int Conf. 2017; all.
- [26] Mengistu G, Azage M, Gutema H. Iron Deficiency Anemia among In-School Adolescent Girls in Rural Area of Bahir Dar City Administration, North West Ethiopia. *Anemia.* 2019; 2019: 1–9.