



## RESEARCH ARTICLE

# Knowledge and Awareness Regarding Premarital Screening of $\beta$ -thalassemia among Undergraduate Students in Bangladesh

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## Abstract

**Introduction:** Thalassemia is the most common congenital single gene disorder in Bangladesh. Considering the nature of the disease inherited from parents, thalassemia can effectively be prevented by premarital blood screening before marriage. The aim of the study was to assess the level of knowledge and awareness regarding premarital screening of  $\beta$ -thalassemia among undergraduate students.

**Materials and Methods:** This cross sectional study was conducted among conveniently selected 156 undergraduate students of 2 universities at Dhaka University and American International University-Bangladesh (AIUB) from January to December 2019. Data were collected by pretested semi-structured questionnaire through face to face interview. Data was analyzed using SPSS software version 23.

**Results:** It was found that about 49.5%, 43.6% and 7.1% of respondents had poor, average and good knowledge about premarital screening of  $\beta$ -thalassemia respectively where there was statistical significance between the level of knowledge and the parental consanguinity and the family history of thalassemia ( $p$ -value<.05). On the other hand, 66.7%, 32.1% and 1.3% had poor, average and good awareness in this regards respectively. The level of awareness was significantly associated with the parental consanguinity, family history of thalassemia, monthly income and family type ( $p$ -value<.05).

**Conclusion:** This study showed knowledge and awareness levels among undergraduate students regarding premarital screening of  $\beta$ -thalassemia were insufficient. The thalassemia prevention can be enhanced by a well-organized educational program focusing on thalassemia and early screening in young adults.

**Keywords:** Thalassemia, gene disorder, premarital blood screening

## 1 | INTRODUCTION

**T**halassemia is a hereditary disorder that involves the decreased and defective production of hemoglobin and it is not infectious; it only transmits genetically from parents to their children (1). It is accounted that 80-90 million people are  $\beta$ -thalassemia carriers globally (2), and the rates are higher in the Mediterranean, Middle East, Central Asia and the Indian subcontinent and North America (3). In Bangladesh, approximately 7% of the populations are the carrier of  $\beta$ -thalassemia (4). Unlike; a report states that the carrier status of thalassemia trait is about 10% in Bangladeshi nationals (5).

The rapidly growing numbers of children diagnosed as thalassemia in Bangladesh clearly indicate that thalassemia is an emerging health burden of the country (6). Though, thalassemia is a severe and incurable disease, it is only manageable when it is prevented (6). Effective prevention can minimize the affected births approximately to 95% (7). Premarital screening has been proved as an effective approach for preventing the incidence of thalassemia in many developed and developing countries so far (8, 9). Implementing and designing an educational intervention about a specific topic for a specific population requires understanding the depth and attitudes of their knowledge. Such as medical undergraduate students possess good knowledge and positive attitude towards thalassemia (10) where non-medical student exposure to medical knowledge particularly thalassemia is quite limited, as a result, their knowledge and awareness is not high (11). Earlier authors found that premarital screening, knowledge and awareness about thalassemia are associated with the socio-demographic profile of the participants such as age, gender, marital and residence status, education, occupation, family income, parental consanguinity, family type and family history of thalassemia (12, 13).

This study sought to identify the level of awareness and knowledge regarding pre-marital screening of thalassemia among undergraduate students; thus the relevant authorities could get an insight of the intervention program in this regard.

## 2 | MATERIALS AND METHODS:

This descriptive cross-sectional study was conducted to assess the level of knowledge and awareness regarding premarital screening of  $\beta$ -thalassemia among conveniently selected 156 undergraduate students at the selective universities in Dhaka which was lasted for almost 1 year (From January to December, 2019). Two universities such as Dhaka University and American International University-Bangladesh (AIUB) were conveniently selected as the study place. Sample size of the study was set by using a standard and validated equation (14). All the undergraduate students regardless of their age, gender, religion, marital status, living area, and the studying subject were included in this study. A semi-structured questionnaire containing 31 items was used to collect the data.

Prior to implementing the main questionnaire, necessary approval and consent was taken from the authority of National Institute of Preventive and Social Medicine (NIPSOM), Bangladesh, Dhaka University, American International University-Bangladesh and the participants. Descriptive statistics were calculated for all of the variables, including continuous and categorical variables and presented through the table. In order to find out the significant association between the variables, inferential analysis was applied by using SPSS version 23. A p-value of  $<0.05$  were considered as significant.

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**Supplementary information** The online version of this article (<https://doi.org/10.15520/jcmro.v4i01.379>) contains supplementary material, which is available to authorized users.

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**TABLE 1:** Socio-demographic profile of the participants (n=156)

Variables and Sub-groups		Frequency	Percentage (%)
Age group (in years)	18-21	61	39.1
	22-25	95	60.9
	Mean± SD=21.53± 1.183		
Gender	Male	83	53.2
	Female	73	46.8
Marital status	Unmarried	143	91.7
	Married	13	8.3
Residence	Rural	32	20.5
	Urban	124	79.5
Family income	10000-25000	43	27.6
	25001-40000	40	25.6
	40001-55000	25	16.0
	55001-70000	14	9.0
	70001-85000	4	2.6
	85001-10000	30	19.2
Parental consanguinity	No	147	95
	Yes	9	5
Family history of Thalassemia	No	149	95.5
	Yes	7	4.5
Religion	Islam	138	88.5
	Hindu	15	9.6
	Christian	2	1.3
	Buddhist	1	0.6
Family type	Nuclear	133	85.3
	Joint	23	14.7

### 3 | RESULTS:

The socio-demographic status of participants can be noticed in Table 1. There were 156 participants in the study. The mean age of the participants was  $21.53 \pm 1.183$  years. The male participants was 83(53.2%) and female participants' 73(46.8%). 143(91.7%) were unmarried and 13(8.3%) respondents were married. Most of the respondents 124(79.5%) were from urban area while only 32(20.5%) respondents were from rural area. About 147(95%) had no history of parental consanguinity and in case of family history of thalassemia, only 7(4.5%) respondents had positive family history. It was observed that 138(88.5%) of respondents were belonging to Islam religion. However, among the participants, 133(85%) were from nuclear family.

Table 2 shows the status of participants' knowledge about the premarital screening of  $\beta$ -thalassemia. It is observed that 50.6%, 60.3%, 16.0%, 46.2%, 69.9%, and 43.6 % respondents had positive knowledge that the thalassemia is a hereditary and blood disorder, and it is due to blood deficiency, consanguineous marriage and thalassemia trait couple, and it can be detected by blood test.

Participants' awareness regarding the premarital screening of  $\beta$ -thalassemia can be found in Table 3. About 51.3% of respondents received information about  $\beta$ -thalassemia from the mass media. Approximately 7.7% thought that thalassemia is an anemic disease. Almost 78.8% of interviewees' believed that premarital screening can raise awareness about healthy and sound marriages.

**TABLE 2:** Information related to knowledge regarding premarital screening of  $\beta$ -thalassemia (n=156)

	No		Yes	
	Frequency	Percentage	Frequency	Percentage
B-thalassemia is a hereditary disease?	77	49.4	79	50.6
B-thalassemia is a blood disorder?	62	39.7	94	60.3
Thalassemia due to deficiency of blood formation?	131	84.0	25	16.0
Do you know about role of consanguineous marriage in the incidence of $\beta$ -thalassemia?	84	53.8	72	46.2
Thalassemia trait couple have a chance their child have thalassemia?	47	30.1	109	69.9
thalassemia can be detected by blood test like Hb-Electrophoresis	88	56.4	68	43.6
Individuals who have thalassemia lead normal lives with appropriate treatment?	77	49.4	79	50.6
Thalassemia has any treatment?	89	57.1	67	42.9
Premarital screening can be beneficial to prevent $\beta$ -thalassemia?	78	50.0	78	50.0
Premarital screening of $\beta$ -thalassemia important for future married life?	34	21.8	144	78.2
Premarital consultation is needed before marriage?	29	18.6	127	81.4
Person who have been diagnosed with $\beta$ -thalassemia have problem in day to day life?	81	51.9	75	48.1
Person who have been diagnosed with $\beta$ -thalassemia have problems in his/ her social life?	100	64.1	56	35.9
B-thalassemia lead to heart/ liver/ lungs diseases?	136	87.2	20	12.8
B-thalassemia lead to bones/ spleen diseases?	137	87.2	19	12.2
Thalassemia leads to death?	103	66.0	53	34.0

Table 4 illustrates the distribution of the respondents according to their knowledge and awareness level. Among 156 respondents, 77 (49.4%) respondents had scored from 0 to 7 which categorized as poor knowledge. In regards to awareness level, 104 (66.7%) respondents had scored from 0 to 1 which represented the poor awareness.

Table 5 shows the association of respondents by socio-demographic characteristics and the level of knowledge and awareness regarding premarital screening of  $\beta$ -thalassemia. In the case of knowledge, the statistical significant was found with parental consanguinity ( $p<0.002$ ), and family history of the respondents ( $p<0.002$ ). On the other hand, family income ( $p<0.001$ ), parental consanguinity ( $p<0.002$ ), family history ( $p<0.002$ ), and family type ( $p<0.007$ ) had significant association with the awareness level of the respondents.

#### 4 | DISCUSSION:

This cross-sectional study was conducted to find out the level of knowledge and awareness about the  $\beta$ -thalassemia among purposively selected 156 undergraduate students in Bangladesh. A semi-structured questionnaire containing 31 items was used for extracting data from the undergraduate students of Dhaka University and American International University Bangladesh.

The present study showed that about 49.4% respondents' had poor knowledge about premarital screening of  $\beta$ -thalassemia which is far better than a study conducted in Saudi Arabia (15). In contrast, a very similar percentage of respondents to the current study (43.6%) and a study conducted among nursing students (46.5%) in Egypt (16) illustrated that they contain an average score of knowledge in this field.

**TABLE 3:** Information related to the awareness regarding premarital screening of  $\beta$ -thalassemia(n=156)

		No		Yes	
		Frequency	Percentage	Frequency	Percentage
<b>Source</b>	Mass-media	76	48.7	80	51.3
	Relatives	136	87.2	20	12.8
	Friends/family	100	64.1	56	35.9
	Health-care providers	87	55.8	69	44.2
<b>Individual who have thalassemia are anemic?</b>		144	92.3	12	7.7
<b>Want to marry a thalassemia patient/carrier?</b>		149	95.5	7	4.5
<b>Thalassemia can sometimes be treated with blood transfusion?</b>		139	89.1	17	10.9
<b>Premarital screening raises awareness about healthy and sound marriages?</b>		33	21.2	123	78.8
<b>Marriage between healthy person and a carrier lead to minor thalassemia child?</b>		114	73.1	42	26.9

**TABLE 4:** Level of knowledge and awareness regarding premarital screening of  $\beta$ -thalassemia(n=156)

Level	Knowledge			Awareness		
	Scoring range	Frequency (f)	Percentage (%)	Scoring range	Frequency (f)	Percentage (%)
Poor	0-7	77	49.4	0-1	104	(66.7%)
Average	8-11	68	43.6	2-3	50	(32.1%)
Good	12-16	11	7.1	4-5	2	(1.3%)

In terms of good knowledge regarding premarital screening of  $\beta$ -thalassemia, only 7.1% of students had presented this type of level in this research which is little bit lower (12.17%) compared to a research carried out in Iran among university students (17). Unlike these, previous studies have shown that large amounts of medical students have a good knowledge of  $\beta$ -thalassemia (18, 19). Since those studies' participants were from the medical colleges, therefore, it is understandable for this type of difference compared to the present research finding. Therefore, depth studies about thalassemia among non-medical

students are required to carry out in Bangladesh.

It has been observed that almost 50.6% and 60.3% of this study respondents' knew the genetic nature and the blood disorder of thalassemia respectively whereas a study by Qadir and Rizvi (20) in Pakistan revealed that 92.1% of respondents knew that thalassemia is a familial disease. The present study found that less than 50% of respondent knew about the role of cousin marriage towards the causation of thalassemia (21) while a study stated that consanguineous marriages increases the chances of having children with thalassemia (21). In contrast, nearly



**Table 5:** Association among the level of knowledge and awareness with the socio-demographic profile of participants

Variables	Subgroups	Level of knowledge			Statistics	Level of awareness			Statistics
		Poor knowledge f (%)	Average knowledge f (%)	Good knowledge f (%)		Poor awareness f (%)	Average awareness f (%)	Good awareness f (%)	
Age group (in years)	18-21	29 (37.7)	28 (41.2)	4 (36.4)	p= .894	41(39.4)	19(38.0)	1(50.0)	p= .937
	22-25	48 (62.3)	40 (58.8)	7 (63.6)		63(60.6)	31(62.0)	1(50.0)	
Gender	Male	39 (50.6)	37 (54.4)	7 (63.6)	p= .697	51(49.0)	30(60.0)	2(100.0)	p= .182
	Female	38 (49.4)	31 (45.7)	4 (36.4)		54(51.0)	20(40.0)	0(0.0)	
Marital Status	Unmarried	74 (96.1)	59 (86.8)	10 (90.9)	p= .127	97(93.3)	44(88.0)	2(100.0)	p= .112
	Married	3 (3.9)	9 (13.2)	1 (9.1)		7(6.7)	6(12.0)	0(0.0)	
Residence	Rural	12 (15.6)	17 (25.0)	3 (27.3)	p= .317	17(16.3)	15(30.0)	0(0.0)	p= .112
	Urban	65 (84.4)	51 (75.0)	8 (72.7)		87(83.7)	35(70.0)	2(100.0)	
Family Income (monthly)	10000-25000	14 (18.2)	25 (36.8)	4 (36.4)	p= .265 104(100)	23(22.1)	20(40.0)	0(0.0)	p= .001
	25001-40000	20 (26.0)	17 (25.0)	3 (27.3)		24(23.1)	16(32.0)	0(0)	
	40001-55000	13 (16.9)	10 (14.7)	2 (18.2)		16(15.4)	8(16.0)	1(50.0)	
	55001-70000	9 (11.7)	5 (7.4)	0 (0)		10(9.6)	4(8.0)	0(0.0)	
	70001-85000	1 (1.3)	3 (4.4)	0 (0)		3(2.9)	1(2.0)	0(0.0)	
	85001-10000	20 (26.0)	8 (11.8)	2 (18.2)		28(26.9)	1(2.0)	1(50.0)	
Parental consanguinity	No	98(94.2)	49(98.0)	0(0.0)	p= .002	98(94.2)	49(98.0)	0(0.0)	p= .002
	Yes	6(5.8)	1(2.0)	2(0.0)		6(5.8)	1(2.0)	2(0.0)	
Family history of Thalassaemia	No	100(96.2)	49(98.0)	0(0.0)	p= .002	100(96.2)	49(98.0)	0(0.0)	p= .002
	Yes	4(3.8)	1(2.0)	2(100.0)		4(3.8)	1(2.0)	2(100.0)	
Religion	Islam	94(90.4)	42(84.0)	2(100.0)	p= .935	94(90.4)	42(84.0)	2(100.0)	p= .557
	Hindu	7(6.7)	8(16.0)	0(0.0)		7(6.7)	8(16.0)	0(0.0)	
	Christian	2(1.9)	0(0.0)	0(0.0)		2(1.9)	0(0.0)	0(0.0)	
	Buddhist	1(1.0)	0(0.0)	0(0.0)		1(1.0)	0(0.0)	0(0.0)	
Family type	Nuclear	95(91.3)	36(72.0)	2(100.0)	p= .317	104 (100)	50 (100)	2(100)	p= .007
	Joint	9(8.7)	14(28.0)	0(0.0)		95(91.3)	36(72.0)	2(100.0)	
	Total	104 (100)	50(100)	2 (100)		9(8.7)	14(28.0)	0(0.0)	

three quarter of the students had correct knowledge about the chance of having thalassemic child in both carrier parents which is little bit less than a study conducted among the Doctors in West Bengal, India (18). However, well over three quarter of the students of the current study was knowledgeable about the preventive measure of thalassemia. This study showed that most of the students did not have proper knowledge about the consequence of this disease. Hence, the concerned authorities are requested to revise the non-medical undergraduate programs' curriculum.

In regards to the awareness of  $\beta$ -thalassemia, this study found about 66.7%, 32.1%, and 1.3% of participants had a poor, average, and a good level of score which is very similar with a study conducted by Ghafoor et al (22) in the case of the poor and average level of awareness. As opposed to, there is a very large difference between the current study and a previous study (22) on the percentage of participants who have a good level of awareness about thalassemia. Variety of social, familial, and educational attitudes among participants in the two studies may be responsible for revealing such results. Thus, it is recommended to conduct a similarly relevant study with participants with similar characteristics.

This study found that most of the participants were aware about the significance of pre-marital screening which is higher than a study of India (23). Respondents were somewhat confused about marriage with thalassemia carriers and the status of child thalassemia as a result of marriage. In addition, it was noticed that the present study's maximum population were not aware about the proper treatment of thalassemia which is consistent to a prior study (20). Interestingly, more than 90% of the present study participants were against that the thalassemia individuals are anemic which upholds a study report carried out in Vietnam (24). Although earlier author have demonstrated lower initial hemoglobin levels in patients with coexisting anemia and thalassemia trait (25). Thus, further study between the relationship between thalassemia and anemia are recommended to conduct. However, a study found the electronic media as an effective way of health promotion (26) while this study's half of the respondents also received information about thalassemia from the

mass media. Therefore, authorities are requested to promote the prevention of thalassemia comprehensively using electronic and social media.

There was a statistical significance between the family history of thalassemia and the knowledge level of the participants in this study, which is supported by a previous study conducted in Jeddah (15). In the matter of association between the parental consanguinity of the respondents and knowledge level, the finding of this study was not similar to the Jeddah study (15) because the current research found a statistical significance in this regard. However, the current study did not find any relationship between the level of knowledge and respondents' age, gender, marital status, residence, family income, religion and family type. Unlike, prior studies observed association between age, gender, marital and residence status, and family income precisely (13, 15). But, the present study found a strong association between the awareness level and the participants' family income, parental consanguinity, family history, and the category of family type. Due to the rare literature on thalassemia awareness levels among students, the current study's these findings has not been justified and supported; therefore, there is a need to conduct detailed and in-depth research in this regard.

## 5 | CONCLUSION:

This study accomplished its purposes by assessing the level of knowledge and awareness among undergraduate students, and found that about half of the participants had poor knowledge about thalassemia. Of these, a large proportion of students had inadequate awareness of this genetic disorder. In addition, possession of knowledge and awareness can be varied widely with the socio-demographic status of participants. Since premarital screening is one of the most important plans and strategies for preventing genetic disorders like thalassemia, therefore, concerned authorities should take a comprehensive preventive program from local to national level.

### Acknowledgment:

The authors are grateful to the authority of the National Institute of Preventive and Social Medicine

## KNOWLEDGE AND AWARENESS REGARDING PREMARITAL SCREENING OF $\beta$ -THALASSEMIA AMONG UNDERGRADUATE STUDENTS IN BANGLADESH

(NIPSOM), Dhaka University, and American International University-Bangladesh (AIUB) for the support and co-operation throughout the study.

### REFERENCES

1. Tari K, Valizadeh Ardalan P, Abbaszadehdibavar M, Atashi A, Jalili A, Gheidishahran M. Thalassemia an update: molecular basis, clinical features and treatment. *International Journal of Biomedicine and Public Health*, 2018 ; 1(1): 48-58.
2. Origa R.  $\beta$ -Thalassemia. *Genetics in Medicine*, 2017; 19(6):609.
3. Hossain MS, Raheem E, Sultana TA, Ferdous S, Nahar N, Islam S, Arifuzzaman M, Razzaque MA, Alam R, Aziz S, Khatun H, Rahim A, Morshed M. Thalassemias in South Asia: clinical lessons learnt from Bangladesh. *Orphanet J Rare Dis* , 2017;12(1):93.
4. Bangladesh Thalassemia Foundation. 2020. [Accessed]
5. Khan WA. Thalassemia: The present and future for Bangladesh, 2019. [Accessed]
6. Tahura S, Selimuzzaman M, Khan WA. Thalassemia Prevention: Bangladesh Perspective - A Current Update. *Bangladesh Journal of Child Health*, 2017; 40(1):31–38.
7. Rahman, MM, Naznin L , Giti S, Islam MS, Khatun N. Premarital health screening – a review and update. *Journal of Armed Forces Medical College, Bangladesh*, 2015; 10(1), 103-9.
8. Cousens NE, Gaff CL, Metcalfe SA, Delatycki MB. Carrier screening for Beta-thalassaemia: a review of international practice. *European Journal of Human Genetics*, 2010; 18: 1077–83
9. Mirza A, Ghani A, Pal A, Sami A, Hannan S, Ashraf Z et al. Thalassemia and premarital screening: Potential for implementation of a screening program among young people in Pakistan. *Hemoglobin*, 2013;37(2):160-70.
10. Pujani M, Chauhan V, Agarwal C, Rana D, Singh K, Dixit S. Knowledge and attitude among Indian medical students towards thalassemia: a study in Delhi NCR. *International Journal of Research in Medical Sciences*, 2017; 5(10):4470-77
11. Murthy CRV, Asraf Bin Zulkefllie MZ, Venkateswaran SP, Barua A. Knowledge, awareness and participation of medical and non-medical students in the Malaysia national thalassemia prevention program. *Int J Hum Genet*, 2015; 15(2): 61-72.
12. Qurat-ul-Ain, Ahmad L, Hassan M, Rana SM ,Jabeen F. Prevalence of  $\beta$ -thalassemic patients associated with consanguinity and anti-HCV - antibody positivity – a cross sectional study. *Pakistan J. Zool*, 2011; 43(1):29-36.
13. Basu M. A study on knowledge, attitude and practice about thalassemia among general population in outpatient department at a tertiary care hospital of Kolkata. *Journal of Preventive Medicine and Holistic Health*, 2015;1(1):6-13
14. Hoque MM. ABC of research methodology and biostatistics. (3rd eds.), Bangladesh medical book seller association, Dhaka, Bangladesh, 2019, pp.146-159.
15. Ibrahim NKR, Al-Bar H, Al-Fakeeh A, Ahmadi JA, Qadi M, Al-Bar A, Milaat W. An educational program about premarital screening for unmarried female students in King Abdul-Aziz University. Jeddah, *Journal of Infection and Public Health*, 2011; 4 (1):30-40



16. Ali M, Elshabory N, Hassan HE, Zahra N, Alrefai H. Perception about premarital screening and genetic counseling among males and females nursing students. *IOSR Journal of Nursing and Health Science*, 2018 ; 7 (1): 51-57.
17. Seyam SH, Assemi A. Study of the knowledge in Guilan university students about thalassemia. *Nurs Midwifery J*, 2010;8(3)
18. Chatterjee S, Mondal TK, Ahamed A, Sarkar I, Sarkar K, Shahbabu B et al. Knowledge, attitude, and practice of budding doctors in prevention of thalassemia. *International Journal of Preventive and Public Health Sciences* , 2016 ; 2(4):18-24.
19. Haque ATME , A'thirah bt Puteh F , Lailis bt Osman N , Zain ZAM, Mainul Haque M. Thalassemia: Level of awareness among the future health care providers of Malaysia. *Journal of Chemical and Pharmaceutical Research*, 2015; 7(2):896-902.
20. Qadir MI, Rizvi M. Awareness about thalassemia in post graduate students. *MOJ Immunol*, 2018; 6(5):163-65.
21. Uddin MM, Haq FU, Sarfaraz A, Khan MMA, Nazim A, Maqsood B et al. Frequency and awareness of thalassemia in families with cousin marriages: a study from Karachi, Pakistan. *British Journal of Medicine & Medical Research*, 2017; 21(3): 1-11 .
22. Ghafoor MB , Leghari MS, Mustafa G, Naveed S. Level of awareness about thalassemia among parents of thalassaemic children. *Journal of Rawalpindi Medical College*, 2016;20(3):209-11.
23. Kumar M, Mukunda valli S, Sharma VL, Goel NK ,Sehgal A. A study regarding awareness among the university students about the disease beta thalassemia. *Public Health Open Access*, 2019 ; 3(2):1-7.
24. Siridamrongvattana S, Van Hoa N, Sanchaisuriya K, Dung N, Hoa PTT, Sanchaisuriya P et al. Burden of anemia in relation to thalassemia and iron deficiency among Vietnamese pregnant women. *Acta Haematologica*, 2013; 103(4):281-87.
25. Verma S, Gupta R, Kudesia M, Mathur A, Krishan G, Singh S. Coexisting iron deficiency anemia and beta thalassemia trait: effect of iron therapy on red cell parameters and hemoglobin subtypes. *International Scholarly Research Notices*, 2014.
26. Yousaf M, Ayaz HM, Tahir T, Bibi M, Tanoli ZK. Awareness about thalassemia among the management students of selective universities of Peshawar, Pakistan. *Rawal Medical Journal*, 2015 ;40 (4): 449-52.

**How to cite this article:** Pervin S., Sultana H., Ahmed T., Haque A., Abbas M.G., Hasan M.M. **Knowl-edge and Awareness Regarding Premarital Screening of  $\beta$ -thalassemia among Undergraduate Students in Bangladesh.** *Journal of Current Medical Research and Opinion*. 2021;730–737.  
<https://doi.org/10.15520/jcmro.v4i01.379>