

Original Research Article

Knowledge and attitude among Indian medical students towards thalassemia: a study in Delhi NCR

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ABSTRACT

Background: Thalassemia can easily be prevented by awareness, education, screening, premarital genetic counselling and prenatal diagnosis. There are only a handful of articles on knowledge and awareness about thalassemia among general population or parents of thalassaemic children. Aims and objectives was to evaluate the level of awareness, knowledge and attitudes of medical students towards thalassemia as well as to analyse the differences if any between the first year and second year MBBS students and their correlation with various socio-demographic parameters.

Methods: This was an institutional based cross sectional observational descriptive study regarding knowledge and attitude of first and second year MBBS students about thalassemia using a pre-designed, structured, self-administered questionnaire. Data was analyzed using SPSS software version 17. Values of $p < 0.05$ were considered significant.

Results: Mean knowledge scores of second year MBBS students compared to first year MBBS were 11.73 ± 1.78 versus 10.8 ± 1.92 , the difference being statistically significant, however, the difference between mean attitude scores was not found to be significant. There was no effect of age, gender, region or Kuppusswamy's socio-economic class on the knowledge or attitude of MBBS students towards thalassemia.

Conclusions: Majority of the MBBS students had good knowledge and positive attitude towards thalassemia. To confirm the observations, large scale studies need to be conducted comprising of different study populations. Screening for thalassemia should be made mandatory, as part of medical examination, at entry to a medical college so that the medical college students are sensitized and can spread awareness among general population.

Keywords: Attitude, Awareness, MBBS students, Knowledge, Thalassemia

INTRODUCTION

The dictum 'Prevention is better than cure' holds true for most of the diseases, however, it is the only option for most of the genetic diseases including hemoglobinopathies. Hemoglobinopathies being a significant cause of morbidity and mortality, impose a great burden on global healthcare.

Thalassemia is the most common among these with an overall prevalence of beta thalassemia approaching 3-4 % in India with certain communities like Muslims, Sindhis, Kutchi, some tribals etc having 8-10% prevalence of β thalassemia trait (β TT).¹ About 10% of the global thalassemia children are born in India, every year.² Mohanty et al (ICMR) conducted a multicentre study in six cities of six states of India (Maharashtra, Gujarat,

West Bengal, Assam, Karnataka and Punjab) to determine the prevalence of haemoglobinopathies in different caste/ethnic groups using uniform methodology.³ The prevalence of β -thalassemia trait ranged from 1.48 to 3.64 % in different states while the overall prevalence was 2.78 %. The prevalence of β -thalassemia trait in 59 ethnic groups varied from 0 to 9.3 %.

Thalassemia can easily be prevented by awareness, education, screening, premarital genetic counselling and prenatal diagnosis. There have been studies in literature on level of awareness about thalassemia among medical students with variable results.⁴⁻⁶ On review of Indian literature, we came across only a handful of articles on knowledge and awareness about thalassemia, however, these mainly focus on general population or parents of thalassaemic children.⁷⁻⁹ Recently, there has been a single study on Indian junior doctors in this regard.¹⁰ Selecting medical students for testing the knowledge and attitudes towards thalassemia has an advantage as they being at the grass root level form an important part of healthcare system, hence they will further help in creating awareness in the community.

The aims and objectives of present study were to evaluate the level of awareness, knowledge and attitudes of medical students towards thalassemia as well as to analyse the differences if any between the first year and second year MBBS students and their correlation with various socio-demographic parameters.

METHODS

This was an institutional based cross sectional observational descriptive study regarding knowledge and attitude about thalassemia. It was carried out over 3 months, January-March 2017. The study was approved by the institutional ethics committee. First year and second year MBBS students of the ESIC Medical college, Faridabad formed the study group.

Inclusion criteria: All MBBS students who gave consent to participate in the study were included.

Exclusion criteria: The MBBS students who did not give consent and those students who did not completely fill the questionnaire were excluded from the study.

The study tool was a pre-designed, structured, self-administered questionnaire. Questionnaire was designed by faculty from pathology in consultation with faculty from community medicine. It was given to 30 randomly selected MBBS students from first year and second year to obtain their opinion and necessary modifications were done. This group of 30 students was not included in the study.

It comprised of three sections- Section I- Socio-demographic data (age, gender, religion, occupation,

education and income). Section II- Questions pertaining to participant's knowledge about thalassemia (15 in number). Section III- Questions related to attitude towards thalassemia (9 in number).

Socio-demographic data was used to calculate the updated Kuppaswamy socio-economic class (2014, May, current price index).¹¹ In the second part, student's knowledge about thalassemia was assessed across several domains: (1) General knowledge about thalassemia (2) Knowledge about inheritance (3) Knowledge about diagnosis (4) Knowledge about treatment. The answers were either in the form of multiple options provided or Yes/No. Each correct answer was given a score of 1. So, the maximum score was 15. The scores were graded into excellent (13-15), good (10-12), average (7-9) and poor (<6) based on the scores.

The third section of the questionnaire was designed to assess the attitude of the participants towards thalassemia and consisted of 9 questions. The answers were either Yes/No/No response. Each correct response was marked as 1. So, a score more than or equal to 5/9 was considered as a positive attitude while a score less than 5/9 was taken as negative attitude.

Data was analyzed using SPSS software version 17. Values of $p < 0.05$ were considered significant. Descriptive statistics such as mean, median, SD were calculated wherever required. The chi square test was used to test the significance of differences in percentages between the two groups.

RESULTS

Questionnaires were distributed to a batch of first year and second year MBBS students (100 each), but a total of 143 students completed and returned the questionnaire. The 30 students who participated in the pilot study were not included. The incompletely filled questionnaires were not included in the analysis. So, the study group comprised of 74 first year MBBS students (Group I) and 69 second year MBBS students (Group II).

Among the Group I (first year MBBS students), 59.46% (44/74) were males while 40.54% (30/74) were females. Majority of the 1st year MBBS students, 54.05% were in the 18-19 years age group with a mean age group of 18.93 (SD=1.15). 74.32% (55/74) 1st year students belonged to urban population. The most common source of information about thalassemia was during MBBS study (53.5%), followed by mass media (16.67%). On analysis of scores based on knowledge 67% students had an above average knowledge about thalassemia. The characteristics of study population are depicted in Table 1.

Among the Group II (second year MBBS students), the Male:Female distribution was more or less uniform (47.83% versus 52.17%). The mean age was 19.89 years

with SD 2.62. Similar to first year MBBS students, the most common source of information about thalassemia

was during MBBS study (79.49%).

Table 1: Comparison of various parameters between MBBS first years and second years.

Variable	Status	No. of first year MBBS students (percentage) (n=74)	No. of second year MBBS Students (percentage) (n=69)	P value
Age	≤19 years	45 (60.81%)	24 (34.78%)	0.001
	>20 years	29 (39.18%)	45 (65.21%)	
Gender	Male	44 (59.46%)	33 (47.83%)	0.163
	Female	30 (40.54%)	36 (52.17%)	
Religion	Hindu	71 (95.94%)	68 (98.55%)	0.62
	Sikh	1 (1.35%)	1 (1.44%)	
	Christian	2 (2.7%)	0	
Region	Rural	19 (25.67%)	22 (31.88%)	0.412
	Urban	55 (74.32%)	47 (68.11%)	
Kuppuswamy's socioeconomic class	Upper (I)	9 (13.04%)	8 (10.81%)	0.029
	Upper-middle (II)	38 (55.07%)	49 (66.21%)	
	Lower-middle (III) and Upper-lower (IV)	27 (38.37%)	12 (16.21%)	
	Mass media	14 (16.67%)	9 (11.54%)	
Source of information about thalassemia	Family/friends	10 (11.9%)	2 (2.56%)	0.024
	During MBBS study	45 (53.57%)	62 (79.49%)	
	Healthcare providers	2 (2.38%)	1 (1.28%)	
	Excellent	17 (22.97%)	25 (36.23%)	
Good	33 (44.59%)	36 (52.17%)		
Average and poor	23 (32.43%)	8 (11.59%)		
Mean knowledge score±SD		10.8±1.92	11.73±1.78	0.003
Type of attitude based on questionnaire	Positive	68 (91.89%)	67 (97.1%)	0.278
	Negative	6 (8.1%)	2 (2.9%)	
Mean attitude score±SD		6.83±1.87	7.27±1.23	0.097

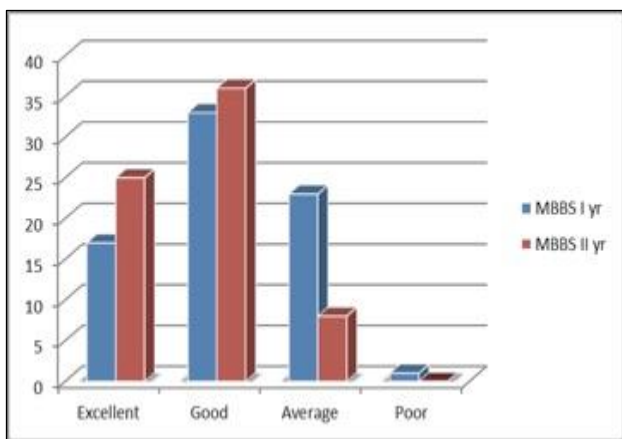


Figure 1: Comparison of knowledge based scores of MBBS I year and II-year students towards thalassemia.

In the knowledge based questionnaire, excellent scores were obtained by 36.23%, good scores by 52.17% and

average scores by 11.59% students. All but one student was aware that thalassemia is a hereditary disease. Although the hereditary nature was known but the inheritance of thalassemia is not clear as many students thought that marriage between normal person and thalassemia minor can result in a thalassemia major child (group 1 versus group 2: 32.43% versus 24.63%). Moreover, many felt that marriage between 2 minor thalassemia individuals was not permissible (group 1 versus group 2: 56.75% versus 60.86%). The details of responses to various questions based on knowledge and attitude are depicted in Tables 2 and 3. Comparison of knowledge based scores of MBBS I year and II-year students is depicted in Figure 1.

Mean knowledge scores of second year MBBS students compared to first year MBBS were 11.73±1.78 versus 10.8±1.92, the difference being statistically significant. There was no effect of age, gender, region or Kuppuswamy's socio-economic class on the knowledge of both the MBBS first and second year students about thalassemia (Table 4).

Table 2: Comparison of responses on knowledge based questionnaire among MBBS I year and II-year students.

Question	Options	MBBS 1 st year response	MBBS 2 nd year response
What is the etiology of thalassemia?	Malnutrition	1 (1.35%)	0
	Hereditary	73 (98.6%)	69 (100%)
	Infection	0	0
	Lifestyle	0	0
	No response	0	0
Do consanguineous marriages have any role to play in the incidence of thalassemia?	Yes	70 (94.5%)	66 (95.65%)
	No	3 (4.05%)	3 (4.34%)
	No response	1 (1.35%)	0
Should premarital screening for thalassemia be compulsory in consanguineous marriages?	Yes	63 (85.1%)	64 (92.75%)
	No	6 (8.1%)	5 (7.24%)
	No response	5 (6.75%)	0
Can the occurrence of thalassemia be predicted?	Yes	60 (81.08%)	56 (81.15%)
	No	11 (14.86%)	12 (17.39%)
	No response	3 (4.05%)	1 (1.44%)
Can thalassemia be diagnosed by a blood test?	Yes	48 (64.8%)	48 (69.56%)
	No	18 (24.32%)	18 (26.08%)
	No response	8 (10.81%)	3 (4.34%)
How can we prevent the occurrence of thalassemia?	Hygiene	2 (2.7%)	0
	Premarital isolation	1 (1.35%)	1 (1.44%)
	Premarital screening	68 (91.89%)	68 (98.55%)
	Dietary	2 (2.7%)	0
	No response	2 (2.7%)	0
Is marriage between two persons with minor thalassemia permissible?	Yes	26 (35.13%)	25 (36.23%)
	No	42 (56.75%)	42 (60.86%)
	No response	6 (8.10%)	2 (2.89%)
Can thalassemia minor patient, later on in life develop thalassemia major?	Yes	24 (32.43%)	16 (23.18%)
	No	44 (59.45%)	49 (71.01%)
	No response	6 (8.10%)	4 (5.79%)
Can marriage between a normal person and a minor thalassaemic result in a major thalassemia child?	Yes	24 (32.43%)	17 (24.63%)
	No	46 (62.16%)	49 (71.01%)
	No response	4 (5.4%)	3 (4.34%)
What is the treatment of major thalassemia?	Dietary	4 (5.12%)	0
	Antibiotics	2 (2.56%)	0
	Blood transfusion	61 (78.20%)	67 (97.1%)
	Iron therapy	9 (11.53%)	2 (2.89%)
	No response	2 (2.56%)	0
Do minor thalassaemic need any treatment?	Yes	32 (43.24%)	17 (24.63%)
	No	37 (50%)	48 (69.56%)
	No response	5 (6.75%)	4 (5.79%)
What is the definite treatment for major thalassemia?	Iron	3 (4%)	2 (2.89%)
	Bone marrow transplantation	57 (76%)	55 (79.71%)
	Blood transfusion	10 (13.33%)	15 (21.73%)
	Iron chelators	1 (1.33%)	0
	No response	4 (5.33%)	0
Patients with thalassemia minor are protected against which parasitic disease?	Malaria	64 (86.48%)	62 (89.85%)
	Dengue	5 (6.75%)	4 (5.79%)
	No response	5 (6.75%)	3 (4.34%)
Does splenectomy play a role in β thalassemia?	Yes	44 (59.45%)	39 (56.52%)
	No	18 (24.32%)	14 (20.28%)
	No response	12 (16.21%)	16 (23.18%)
Are you aware of types of thalassemia? Name them.	Yes	34 (45.94%)	55 (79.71%)
	No	40 (54.05%)	14 (20.28%)

Table 3: Comparison of responses on attitude based questionnaire among MBBS I year and II-year students.

Question	Options	MBBS 1 st year response	MBBS 2 nd year response
Are you willing to undergo blood test for thalassemia screening before marriage?	Yes	63 (85.13%)	61 (88.4%)
	No	7 (9.45%)	7 (10.14%)
	No response	4 (5.4%)	1 (1.44%)
If you come to know that the person you intend to marry is suffering from thalassemia minor, would you still marry him or her?	Yes	46 (62.16%)	40 (57.9%)
	No	25 (33.78%)	25 (36.23%)
	No response	3 (4.05%)	4 (5.79%)
Would you like to donate blood for a thalassemia patient?	Yes	70 (94.59%)	60 (86.95%)
	No	3 (4.05%)	8 (11.59%)
	No response	1 (1.35%)	1 (1.44%)
If there was a major thalassemia patient in your family, would you like to donate your bone marrow for transplantation?	Yes	62 (83.78%)	55 (79.71%)
	No	8 (10.81%)	13 (18.84%)
	No response	4 (5.4%)	1 (1.44%)
Would you like to participate in thalassemia awareness and prevention programs in the community?	Yes	67 (90.54%)	62 (89.85%)
	No	6 (8.10%)	7 (10.14%)
	No response	1 (1.35%)	0 (4.34%)
In your opinion should cord blood banking be promoted more to have a store of stem cell/bone marrow?	Yes	68 (91.89%)	64 (92.75%)
	No	3 (4.05%)	1 (1.44%)
	No response	3 (4.05%)	4 (5.79%)
Should couples who are thalassaemic carriers have children?	Yes	44 (59.45%)	42 (60.86%)
	No	23 (31.08%)	26 (37.68%)
	No response	2 (2.70%)	1 (1.44%)
Premarital screening for thalassemia is necessary for general public?	Yes	66 (89.18%)	61 (88.4%)
	No	7 (9.45%)	8 (11.59%)
	No response	1 (1.35%)	0
Termination of pregnancy with thalassemia major is necessary as it not only brings suffering to the affected child, but it is a burden to the family, community and country?	Yes	39 (52.7%)	55 (79.71%)
	No	27 (36.48%)	13 (18.84%)
	No response	3 (4.05%)	1 (1.44%)

Table 4: Effect of various parameters on knowledge about thalassemia among MBBS students.

Parameter	Status	Score	MBBS 1 st year (n=74)	P value	MBBS 2 nd year (n=69)	P value
Gender	Male	Excellent	8 (18.18%)	0.49	13 (39.39%)	0.48
		Good	18 (40.9%)		15 (45.45%)	
		Average	18 (40.9%)		5 (15.15%)	
	Female	Excellent	9 (30%)		12 (33.33%)	
		Good	15 (50%)		21 (58.33%)	
		Average and poor	6 (20%)		3 (8.33%)	
Age	<20 years	Excellent	12 (26.67%)	0.87	5 (20.83%)	0.128
		Good	19 (42.22%)		16 (66.66%)	
		Average	14 (31.11%)		3 (12.5%)	
	≥20 years	Excellent	6 (20.68%)		20 (44.44%)	
		Good	13 (44.82%)		20 (44.44%)	
		Average and poor	10 (34.48%)		5 (11.11%)	
Region	Rural	Excellent	4 (21.05%)	0.619	9 (40.90%)	0.705
		Good	7 (36.84%)		10 (45.45%)	
		Average	8 (42.10%)		3 (13.63%)	
	Urban	Excellent	13 (23.63%)		16 (34.04%)	
		Good	26 (47.27%)		26 (55.31%)	
		Average and poor	16 (29.09%)		5 (10.63%)	
Kuppuswamy's socioeconomic class	Upper (I)	Excellent	1 (11.11%)	0.619	3 (37.5%)	0.705
		Good	5 (55.55%)		4 (50%)	
		Average	3 (33.33%)		1 (12.5%)	
	Upper-middle (II)	Excellent	9 (23.68%)		18 (36.73%)	
		Good	19 (50%)		27 (55.10%)	
		Average	3 (33.33%)		1 (12.5%)	

	Average and poor	10 (26.31%)	0.587	4 (8.16%)	0.602
Lower-middle (III) and upper-lower (IV)	Excellent	7 (25.92%)		4 (33.33%)	
	Good	9 (33.33%)		5 (41.66%)	
	Average	11 (40.74%)		3 (25%)	

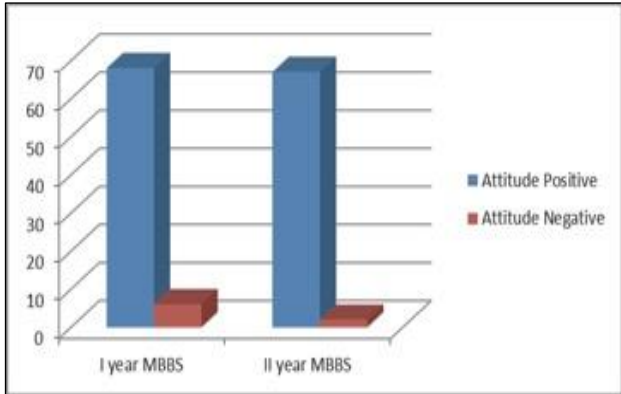


Figure 2: Comparison of attitude of MBBS I year and II-year students towards thalassemia.

On the basis of score obtained on attitude based questions, most of the students in both the groups had a positive attitude towards thalassemia (group 1 versus group 2: 91.89% versus 97.10%). Comparison of Attitude of MBBS I year and II-year Students towards thalassemia is shown in Figure 2. However, the difference between mean attitude scores was not found to be significant (second year versus first year 7.27 ± 1.23 versus 6.83 ± 1.87).

Various parameters like age, gender, region and socio-economic class did not have any impact on the attitude of MBBS students in present study (Table 5). Correlation of knowledge and attitude scores is shown in Table 6.

Table 5: Effect of various parameters on attitude towards thalassemia among MBBS students.

Parameter	Status	Attitude	MBBS 1 st year (n=74)	MBBS 2 nd year (n=69)
Gender	Male	Positive	38 (86.36%)	32 (96.96%)
		Negative	6 (13.63%)	1 (3.03%)
	Female	Positive	30 (100%)	35 (97.22%)
		Negative	0	1 (2.77%)
Region	Rural	Positive	18 (94.73%)	21 (95.45%)
		Negative	1 (5.26%)	1 (4.54%)
	Urban	Positive	50 (90.90%)	46 (97.87%)
		Negative	5 (9.09%)	1 (2.12%)
Kuppuswamy's socioeconomic class	Upper (I)	Positive	7 (77.77%)	7 (87.5%)
		Negative	2 (22.2%)	1 (12.5%)
	Upper-middle (II)	Positive	37 (97.36%)	48 (97.95%)
		Negative	1 (2.63%)	1 (2.04%)
	Lower-middle (III) and upper-lower (IV)	Positive	24 (88.88%)	12 (100%)
		Negative	3 (11.11%)	0

Table 6: Correlation of knowledge and attitude scores among MBBS first year and second year students.

Status	Attitude	MBBS 1 st year (n=74)	MBBS 2 nd Year (n=69)
Excellent	Positive	17 (100%)	25 (100%)
	Negative	0	0
Good	Positive	31 (93.90%)	34 (94.44%)
	Negative	2 (6.06%)	2 (5.55%)
Average	Positive	19 (82.60%)	8 (100%)
	Negative	4 (17.39%)	0
Poor	Positive	1 (100%)	0
	Negative	0	0

DISCUSSION

In the present study, 75.25% (111/143) MBBS students had good knowledge about thalassemia which was comparable to study by Chatterjee et al on Indian junior doctors.¹⁰ On the contrary, various other authors in the literature like Mirza et al (Pakistan; study on young people), Moghaddam M et al (Iran; study on school students) and Pausiri et al (Thailand; study on pregnant women) found much lower values.¹²⁻¹⁴ While Haque et al found that almost 90% future health care providers of Malaysia had good knowledge about thalassemia.⁶ The reason for such a disparity could be that knowledge of general population relies predominantly on mass media, health care providers, awareness programs etc. while medical students have an advantage over the rest of the study population (school children, pregnant women, general population etc) as thalassemia is taught as part of MBBS curriculum. Further, differences in the studies based on medical students could be due to the number of years spent in the medical field. This was evident in the present study as the difference in knowledge scores among first year students and second year MBBS students was statistically significant. We did not come across any study in the literature regarding the comparison of knowledge among MBBS students of different years.

Almost all the participants in present study were aware of the hereditary nature of thalassemia, however some were unclear about the exact nature of inheritance as was depicted from the responses to specify questions based on transmission of the disease. Chatterjee et al found out that 85.11% of junior doctors had correct knowledge about the inherited nature of the disease.¹⁰ Murthy et al revealed 66.3% medical students knew about the familial nature of thalassemia compared with 36.7% of non-medical students.⁴

67.13% (96/143) of the MBBS students in the present study were aware that thalassemia could be diagnosed by a blood test which is much lower compared to junior doctors (91%) in study by Chatterjee et al.¹⁰

89.51% (128/143) of the MBBS students in the present study knew that regular blood transfusion was the therapy for thalassemia. However, 7.6% also opted for iron therapy as an additional treatment option, possibly confusing it with iron chelation. Similarly, 93% of the participants in the study by Chatterjee et al responded correctly about the treatment.¹⁰ However, the knowledge about treatment was poor as observed by Haque et al.⁶ 95.10% (136/143) of the MBBS students were aware that occurrence of thalassemia can be prevented through premarital screening in collaboration with studies by Chatterjee et al and Mirza et al.^{10,12}

In the present study, there was no effect of age, gender, region or Kuppaswamy's socio- economic class on the knowledge of both the MBBS first and second year

students about thalassemia. This is in accordance with the study by Murthy et al.⁴ While Chatterjee et al found a significant correlation between knowledge, age and marital status.¹⁰ Although in the present study, the female MBBS students had better knowledge scores, the difference was not statistically significant, similar to Chatterjee et al but unlike Haque et al.^{6,10}

In the present study, 94.4% MBBS students had a positive attitude (135/143) towards thalassemia. The mean attitude scores of 1st year versus 2nd year MBBS students were 6.83±1.87 versus 7.27±1.23, although the difference was not statistically significant. Moreover, 90.2% of the MBBS students were willing to participate in thalassemia awareness and prevention programs in the community. This is higher than that observed by several other authors like Chatterjee et al, Haque et al, Murthy et al etc.^{4,6,10} This is a promising observation in present study as the enthusiasm and positive energies of these future healthcare providers can be channelized towards various programs to create awareness in community regarding thalassemia and its prevention.

Around 89% (127/143) of MBBS students in present study were in favour of premarital screening being made mandatory for general public. This is quite similar to a study by Chatterjee et al and Murthy et al.^{4,10} In contrast, Mirza et al observed that only 59.4% of university students (Pakistan) were of this view point.¹²

We observed that the knowledge about thalassemia had a positive influence on the attitude. The students with good knowledge about thalassemia proportionately displayed a good attitude as well. This is in accordance with findings of Chatterjee et al.¹⁰ However, on the contrary, Haque et al concluded that level of knowledge was not directly proportional to the level of attitude.⁶

Various parameters like age, gender, region and socio-economic class did not have any impact on the attitude of MBBS students in present study. However, in several other studies some of the parameters correlated with attitude, like study by Haque et al (age and gender affected the attitude) and Chatterjee et al (age, marital status and education correlated with attitude).^{6,10}

90.90% of MBBS students were willing to donate blood for a thalassemia patient while 81.81% (117/143) were even willing to donate bone marrow for bone marrow transplantation of a family member if required. Similar findings were obtained by Chatterjee et al among junior doctors.¹⁰

The limitation of the present study was the small sample size. Therefore, large scale multi-centre studies need to be conducted on knowledge and awareness of medical students towards thalassemia. This would help in obtaining important insights towards planning national strategies for prevention of thalassemia in our country.

CONCLUSION

The study fulfilled the objective to evaluate knowledge and attitude about thalassemia among MBBS students and compare the two groups. Majority of the MBBS students had good knowledge and positive attitude towards thalassemia. The difference in the mean knowledge scores was statistically significant between first and second year MBBS students. The key areas which we need to focus on are the inheritance pattern of thalassemia so that these future healthcare providers can impart correct knowledge to the community and conduct premarital counseling to allay doubts of the general public.

To confirm the observations, large scale studies need to be conducted comprising of different study populations. Mass media (print, TV and movies) needs to contribute towards thalassemia awareness as they have a great impact on the mindset of the youth. Screening for thalassemia should be made mandatory, as part of medical examination, at entry to a medical college so that the medical college students are aware and can spread awareness about it. In a phased manner, it can then be extrapolated to all other colleges and universities and ultimately to the entire population.

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