Medical College Student's Knowledge, Attitude, and Practice Regarding Organ Donation - A Multi Centre Study

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Abstract

Background: Organ donation is the process of retrieving healthy organs and tissues from a living or deceased person for transplantation into another individual in need. It plays a vital role in saving lives and improving the quality of life for patients suffering from organ failure such as kidney, liver or heart.

Methods: This descriptive cross-sectional study was conducted from 21st to 31st October 2024 among final-year students of Anwar Khan Modern Medical College (AKMMC), Green Life Medical College (GLMC), and Northern International Medical College (NIMC). The knowledge, attitude, and practice (KAP) of the students regarding organ donation were assessed using 10 questions on knowledge, 10 on attitude, and 6 on practice, assigning a score of 1 for each correct response and 0 for each incorrect response. Purposive sampling technique was used for data collection and the final sample size was 261. The data were analysed via SPSS (version 25.0) $p < 0.05$ was considered statistically significant.

Results: The study population included 61.3% females and 38.7% males with a mean±SD age of 24.5±1.5 years. AKMMC represented almost half of the participants (48.3%), while GLMC and NIMC accounted for 31.4% and 20.3% of the participants, respectively. The majority of the participants (88.9%) were from urban areas, while only 11.1% were from rural areas. Association between gender and participants' knowledge regarding organ donation was significant ($p = 0.02$), while their attitude towards and practice regarding organ donation was not significant ($p > 0.05$). Females were more knowledgeable than male. Association between medical college and participants' knowledge, attitude, and practice regarding organ donation was not significant ($p > 0.05$). Association between residence and participants' knowledge and practice regarding organ donation was significant ($p = 0.01$), while their attitude towards organ donation was not significant ($p > 0.05$)

Conclusion : The results of our study revealed that the majority of the participants had a satisfactory level of knowledge, showed a positive attitude, but had poor practice regarding organ donation. The majority first heard about organ donation from the internet and were aware that kidney, liver, heart, lung, cornea and bone can be donated. As most of the participants lacked knowledge about 'The Human Organ Transplantation Act' of Bangladesh, awareness programs and activities should be arranged to discuss its details.

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Introduction

Organ donation is a life-saving medical practice in which healthy organs or tissues are transplanted from the donor to the recipient whose organ has failed or been damaged. At the last stage of organ failure, it is the only possible treatment for the patient. It represents one of the greatest achievements of modern medicine, offering hope and a second chance at life to millions of patients suffering from organ failure. Organs that can be donated include the heart, kidneys, liver, lungs, pancreas, uterus, and intestines, while tissues such as corneas, skin, blood vessels, ligaments, bones, and tendons can also be donated.[1]

Since the first transplantation performed in 1954, the ability to enhance and extend life using this procedure has advanced from the experimental stages to that of standard practice. Transplantation is defined as the transfer of human cells, tissues or organs from a donor to recipient with an aim of restoring function(s) in the body.[2]

"The Human Organ Transplantation Act" officially came into force in Bangladesh on April 13, 1999, allowing organ donations from both living and

brain-dead donors. The Act was amended by the Parliament on January 8, 2018, with the changes coming into effect shortly afterwards on January 28, 2018. The Act was revised to extend a living donor pool from close relatives (e.g., parents, adult sons and daughters, adult brothers and sisters, uncles and aunts from both the paternal and maternal sides, and spouses) to include certain other relatives such as grandparents, grandchildren, and first cousins (Section 2:4). The Act was also revised to allow individuals to prioritize family members in receiving their organs after their death (Section 7c:3).[3]

A landmark event marked a new chapter in Bangladesh's medical history and healthcare system on 19th January, 2023. Sarah Islam, 20 years old, suffering from tuberous sclerosis since childhood was declared clinically brain-dead on 18th January 2023, while receiving treatment at Bangladesh Medical University in Dhaka. Sarah became the first person in the country to donate her organs after brain death. The following morning, on January 19, doctors successfully performed Bangladesh's first cadaveric kidney transplantation using her donated organs. Two women in their thirties were the recipients and both recovered well after surgery.[4]

Despite significant medical advancements and the proven success of transplantation, the demand for organs far exceeds the available supply worldwide. This gap is often due to a lack of awareness, misconceptions, and cultural or religious hesitations regarding organ donation. Encouraging education, positive attitudes, and voluntary registration as organ donors are therefore crucial to improving donation rates. Organ donation not only saves lives but also promotes a culture of compassion, altruism, and social responsibility.[5, 6, 7]

So, this study was conducted to assess the knowledge, attitude, and practice regarding organ donation among medical college students in Dhaka.

Materials and methods

It was a descriptive cross-sectional study conducted from 21st to 31st October 2024 to assess the knowledge, attitude, and practice regarding organ donation among final-year students of Anwar Khan Modern Medical College, Green Life Medical College, and Northern International Medical College. Purposive sampling technique was used for data collection and the final sample size was 261. The data were analysed via SPSS (version 25.0) and $p < 0.05$ was considered statistically significant.

Measurement of students' knowledge, attitude, and practice regarding organ donation: For data collection, a 31-item structured pre-tested questionnaire was used which consisted of 4 parts. The first part consisted of 5 questions on socio-demographic profile. The second, third and fourth sections assessed knowledge (K1 to K10) on, attitude (A1 to A10) toward and practice habits (P1 to P6) regarding organ donation, respectively. The responses were recorded on a dichotomous scale (Yes/No). For each "Yes" response it was scored '1' and for each "No" response '0.' Reverse scoring was done for the questions (K4, K7, K8, A10 and P6) where the correct responses were "No."

The total knowledge score ranged from 0-10. With scores 0 to 4 indicates inadequate knowledge, while scores 5 to 6 and 7 to 10 indicate satisfactory and adequate knowledge on organ donation respectively. Total attitude score ranged from 0-10. With scores 0 to 4 indicates negative attitude, while scores 5 to 6 and 7 to 10 indicate indifferent and positive attitude toward organ donation respectively. Regarding practice, the total score ranged from 0-6. With scores 0 to 3 indicates negative response and score 4 to 6 indicates positive response on practice regarding organ donation.

Data Collection and Ethics: After giving verbal informed consent, the participants filled up a questionnaire on knowledge, attitude and practice regarding organ donation. The Northern International Medical College Ethical Review Board approved the study.

Results

In our study, the mean±SD (Standard Deviation) of the participants was 24.5±1.5 years (n = 261). More than four-fifths of the participants (88.9%) reside in urban areas, while about one-tenth (11.1%) reside in rural areas (Figure I). Three-fifths of the participants (61.3%) were female and two-fifths (38.7%) were male. The majority of the participants (80.5%) were Muslim, while only 16.8% were Hindu. Among 261 participants, only six were Christians and one was a Buddhist. Anwar Khan Modern Medical College represented almost half of the participants (48.3%), while Green Life Medical College and Northern International Medical College accounted for 31.4% and 20.3% of the participants, respectively (Table I).

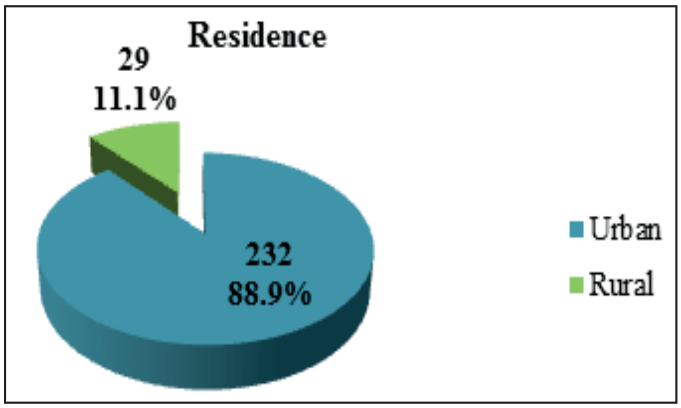

Figure I: Distribution of participants by their residence (n = 261)

Table I: Socio-demographic profile of the participants (n = 261)

Variable	Frequency (n)	Percentage (%)
1. Gender		
Male	101	38.7
Female	160	61.3
2. Medical College Name		
Anwar Khan Modern Medical College (AKMMC)	126	48.3
Green Life Medical College (GMC)	82	31.4
Northern International Medical College (NIMC)	53	20.3
3. Religion		
Muslim	210	80.5
Hindu	44	16.8
Other[a]	7	2.7

[a] = 6 Christians & 1 Buddhist

The majority of the participants (35.2%) first heard about organ donation from the internet, while 30.3% and 24.1% heard about it from relatives and friends, and medical professionals, respectively (Figure II).

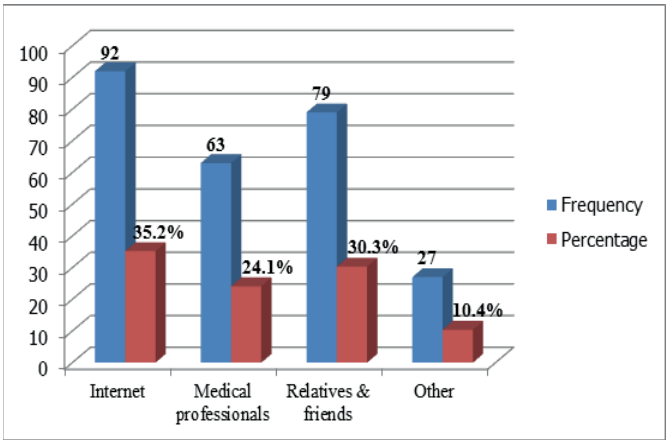

Figure II: Distribution of participants by their source of knowledge about organ donation

In this study the participants' knowledge about different organs and tissues that can be donated were assessed and the result represents on Table II. Almost all of the participants (99.6% & 94.6% respectively) were aware that kidney and liver can be donated. A total of 88.9% and 62.1% of participants, respectively, were positive that the heart and lungs can be donated. The majority of participants (80.1%, 71.6%, and 73.2%, respectively) lacked knowledge about the donation of the intestine, pancreas and uterus. Regarding tissue donation, the majority of participants were aware that the cornea (94.3%) and bone (65.1%) can be donated. Almost half of the participants (47.1% and 47.5%, respectively) were positive that blood vessels and tendons can be donated.

Table II: Distribution of the participants regarding knowledge about organs and tissues that can be donated (n = 261)

Organ / Tissue	Yes n (%)	No n (%)
1) Kidney	260 (99.6)	1 (0.4)
2) Liver	247 (94.6)	14 (5.4)
3) Heart	232 (88.9)	29 (11.1)
4) Lung	162 (62.1)	99 (37.9)
5) Intestine	52 (19.9)	209 (80.1)
6) Pancreas	74 (28.4)	187 (71.6)
7) Uterus	70 (26.8)	191 (73.2)
8) Cornea	246 (94.3)	15 (5.7)
9) Blood vessels	123 (47.1)	138 (52.9)
10) Ligaments	111 (42.5)	150 (57.5)
11) Bone	170 (65.1)	91 (34.9)
12) Tendons	124 (47.5)	137 (52.5)

Almost all the participants (99.6%) had heard the term "Organ Donation", while the majority (95.8%) did not know the year in which "The Human Organ Transplantation Act" came into effect in Bangladesh. More than four-fifths of the participants (87%) had correct knowledge regarding organ donation from a brain-dead patient, while almost half (49%) incorrectly believed that a certified brain-dead registered organ donor should be immediately disconnected from ventilatory support. The majority of the participants (91.6%) correctly answered the question regarding cross-matching of the donor's and recipient's blood groups, while nine-tenths (89.7%) incorrectly believed that the donor's HLA must be identical to that of the recipient for any organ transplantation. About three-fourths of the participants correctly responded that hepatitis B and C carriers cannot donate all their solid organs (78.4%) and that malignancy is always a contraindication to cadaveric organ donation (73.2%)(Table-III).

Table III: Distribution of the participants by their knowledge on organ donation (n = 261)

Variable	Yesn (%)	Non (%)
K1: Have you heard the term "Organ Donation"?	260 (99.6)	1 (0.4)
K2: Do you know in which year 'The Human Organ Transplantation Act' came into effect in Bangladesh? (If Yes, write the correct year)	11 (4.2)	250 (95.8)
K3: Can a brain-dead patient's organs be donated?	227 (87)	34 (13)
K4: Will certified brain-dead registered organ donor be immediately disconnected from ventilation support?[b]	128 (49)	133 (51)
K5: Can parents / guardians make substitute decision making for mentally disabled persons in the regard of organ donation?	188 (72)	73 (28)
K6: Donor's and recipient's blood group MUST be matched?	239 (91.6)	22 (8.4)
K7: Donor's HLA MUST be identical to that of the recipient for any organ transplantation?[b]	234 (89.7)	27 (10.3)
K8: Hepatitis B and C carriers can donate all of their solid organs except the liver organs?[b]	56 (21.5)	205 (78.4)
K9: Malignancy is always a contraindication to cadaveric organ donation (organ donation after death)?	191 (73.2)	70 (26.8)
K10: Organ transplant recipients are more prone to developing of cancer after organ transplantation?	63 (24.1)	198 (75.9)

[b] = For K4, K7 & K8 correct responses were "No"

In this study we found that the majority of participants (95.8%) supported organ donation, while less than half (49%) were willing to donate their own organ after death. More than four-fifths (82%) responded that they will be comfortable in receiving other's organ if needed, while more than half (55.2%) do not agree to donate their family member's organ. Half of the participants' (52.1%) reported that their families agreed with organ donation, while the majority (89.7%) thought that donating one's organ adds meaning to one's life. One-third of the participants (32.6%) were not sure whether their religion supported organ donation, while more than four-fifths (83.1%) were confident that they could counsel patients and their families about organ donation in the future. Three-fifths of the participants (57.1%) had a fear that their bodies would be disfigured if they donated organs. (Table IV)

Table IV: Distribution of the participants by their attitude toward organ donation (n = 261)

Variable	Yes n (%)	No n (%)
A1: Do you support 'Organ Donation'?	250 (95.8)	11 (4.2)
A2: Are you willing to donate your own organs after death?	128 (49)	133 (51)
A3: If needed, will you be comfortable in receiving other's organ?	214 (82)	47 (18)
A4: Do you agree to donate your family member's organ?	117 (44.8)	144 (55.2)
A5: Do your family agree with organ donation?	136 (52.1)	125 (47.9)
A6: Do you think donating one's organ adds meaning to one's life?	234 (89.7)	27 (10.3)
A7: Does your religion agree with 'Organ Donation'?	176 (67.4)	85 (32.6)
A8: Do you feel confident that you could counsel patients & their families about 'Organ Donation' in your future?	217 (83.1)	44 (16.9)
A9: Do you think 'Live Organ Donation' is better than 'Cadaveric Organ Donation' (organ donation after death) in solving shortage?	189 (72.4)	72 (27.6)
A10: Do you have fear that your body will be disfigured, if you donate organs?[c]	112 (42.9)	149 (57.1)

[c] = For A10 correct response was "No"

In our study the majority of the participants (82.8%) and their family members (75.1%) had never taken part in any organ donation awareness programs. Less than one-fifth (18%) worked on creating general awareness regarding organ donation at a personal level, while less than one-tenth had pledged/signed to donate an organ. Less than half of the participants (46%) had a discussion about organ donation with their family. (Table V)

Table V: Distribution of the participants by their practice on organ donation (n = 261)

Variable	Yes n (%)	No n (%)
P1: Have you ever taken part in any organ donation awareness activity done by nongovernment organizations?	45 (17.2)	216 (82.8)
P2: Have you ever done something for general awareness regarding organ donation at a personal level?	47 (18)	214 (82)
P3: Has anyone in your family taken part in organ donation awareness programs?	65 (24.9)	196 (75.1)
P4: Have you ever had a discussion about organ donation with your family?	120 (46)	141 (54)
P5: Have you pledged / signed to donate an organ?	21 (8)	240 (92)
P6: Did you ever receive an organ for transplantation?[d]	7 (2.7)	254 (97.3)

[d] = For P6 correct response was "No"

This study shows the association between gender and participants' knowledge, attitude, and practice regarding organ donation (Table VI). Significant difference (p = 0.02) was found regarding knowledge on organ donation between male and female participants. Females had more adequate knowledge compared to males. No significant differences were found on attitude towards and practice regarding organ donation between male and female ($p > 0.05$)

Table VI: Association between gender and participants' knowledge, attitude, and practice regarding organ donation (n = 261)

Variable	Male (101)	Female (160)	
Knowledge			
Inadequate (26)	10 (9.9%)	16 (10%)	x^2 = 7.84, df = 2 p = 0.02 (significant)
Satisfactory (158)	71 (70.3%)	87 (54.4%)	
Adequate (77)	20 (19.8%)	57 (35.6%)	
Attitude			
Negative (36)	16 (15.8%)	20 (12.5%)	x^2= 1.68, df = 2 p = 0.43
Indifferent (70)	30 (29.7%)	40 (35%)	
Positive (155)	55 (54.5%)	100 (64.5%)	
Practice			
Poor (221)	81 (80.2%)	140 (87.5%)	x^2= 2.54, df = 1 p = 0.11
Good (40)	20 (19.8%)	20 (12.5%)	

The association between the medical college and participants' knowledge, attitude, and practice regarding organ donation presents in Table VII. No significant differences were found between participants of the selected medical colleges regarding knowledge, attitude, and practice about organ donation ($p > 0.05$).

Table VII: Association between medical college and participants' knowledge, attitude, and practice regarding organ donation (n = 261)

Variable	AKMMC (126)	GLMC (82)	NIMC (53)	
Knowledge				
Inadequate (26)	18 (14.3%)	5 (6.1%)	3 (5.7%)	x^2= 6.03, df = 4 p = 0.19
Satisfactory (158)	70 (55.6%)	55 (67.1%)	33 (62.2%)	
Adequate (77)	38 (30.1%)	22 (26.8%)	17 (32.1%)	
Attitude				
Negative (36)	16 (12.7%)	12 (14.6%)	8 (15.1%)	x^2= 7.49, df = 4 p = 0.11
Indifferent (70)	27 (21.4%)	22 (26.8%)	21 (39.6%)	
Positive (155)	83 (65.9%)	48 (58.6%)	24 (45.3%)	
Practice				
Poor (221)	106 (84.1%)	66 (80.5%)	49 (92.5%)	x^2= 3.61, df = 2 p = 0.16
Good (40)	20 (15.9%)	16 (19.5%)	4 (7.5%)	

Association between residence and participants' knowledge and practice regarding organ donation was significant (p= 0.01) (Table VIII). No significant difference (p > 0.05) was found between residence and participants' attitude toward organ donation (Table VIII). Participants from urban areas demonstrated more adequate knowledge but poorer practice regarding organ donation compared to those from rural areas.

Table VIII: Association between residence and participants' knowledge, attitude, and practice regarding organ donation (n = 261)

Variable	Urban (232)	Rural (29)	
Knowledge			
Inadequate (26)	19 (8.2%)	7 (24.1%)	x^2 = 8.26, df = 2 p = 0.01 (significant)
Satisfactory (158)	141 (60.8%)	17 (58.6%)	
Adequate (77)	72 (31%)	5 (17.3%)	
Attitude			
Negative (36)	34 (14.7%)	2 (6.9%)	x^2 = 2.72, df = 2 p = 0.25
Indifferent (70)	59 (25.4%)	11 (37.9%)	
Positive (155)	139 (59.9%)	16 (55.2%)	
Practice			
Poor (221)	201 (86.6%)	20 (69%)	x^2 = 6.2, df = 1 p = 0.01 (significant)
Good (40)	31 (13.4%)	9 (31%)	

Discussion

This descriptive cross-sectional study was conducted to assess the knowledge, attitude and practice regarding organ donation among 5th year students of selected medical colleges. The findings of the present study showed that participants' knowledge was satisfactory, their attitude was positive but their practice regarding organ donation was poor. Kumar G et al., 2021 assessed knowledge and attitude regarding organ donation among undergraduate medical students and showed that students had adequate knowledge and positive attitude towards organ donation.[8] Vincent et al., 2019 assessed knowledge, attitude, and perception regarding organ donation among medical and nursing students and showed similar kind of results.[9] Moonajilin MS et al., 2024 assessed public's viewpoint on organ donation among adults in Bangladesh and showed that participants had limited knowledge but a positive attitude towards organ donation.[1]

Present study showed that 61.3% were females, while 38.7% were males. AKMMC represented almost half of the participants (48.3%), while GMC and NIMC accounted for 31.4% and 20.3% of the participants, respectively. The majority of the participants (88.9%) were residing in urban areas, while only 11.1% were residing in rural areas. Kumar G et al., 2021 showed 58.33% participants were females and remaining 41.67% were males. On the other hand, 69.3% were residing in urban areas and the rest (30.7%) resided in rural areas.[8]

In our study, the majority of the participants (35.2%) first heard about organ donation from internet followed by relatives and friends (30.3%), and medical professionals (24.1%). Moonajilin MS et al., 2024 also showed internet as a major source of knowledge for the participants.[1] Kumar G et al., 2021 showed media (52%) as the major source of knowledge about organ donation among the participants.[9] Some other studies showed similar type of results.[10, 11]

Regarding organs and tissues that can be donated most of the participants were aware that kidney (99.6%), liver (94.6%), heart (88.9%), lung (62.1%), cornea (94.3%) and bone (65.1%) can be donated. Only a small portion of the participants were aware that the intestine (19.9%), pancreas (28.4%), and uterus (26.8%) can be donated. On the other hand, almost half of the participants were aware that blood vessels (47.1%), ligaments (42.5%), and tendons (47.5%) can be donated. The study conducted by Kumar G et al. (2021) showed that more than half of the participants were aware that kidney (79%), liver (70.7%), heart (61%), and cornea (50.7%) can be donated, while only a few had knowledge about the donation of other organs like lung (10.3%), intestine (3.7%), pancreas (0.7%), and uterus (0.7%) as well as tissues including blood vessels (17.7%), ligaments (16.3%), bone (10%), and tendons (6.7%).[8]

Our study revealed that, the participants lacked knowledge about 'The Human Organ Transplantation Act' of Bangladesh. The majority incorrectly believed that the donor's HLA must be identical to that of the recipient for any organ transplantation and organ transplant recipients are not prone to develop cancer after organ transplantation. We assessed the association between gender and participants' knowledge, attitude, and practice regarding organ donation and found significant difference

(p = 0.02) only in the case of knowledge. Females had more adequate knowledge compared to males. Association between medical college and participants' knowledge, attitude, and practice regarding organ donation was not significant ($p > 0.05$). We found a significant difference between residence and participants' knowledge (p = 0.02) and practice (p = 0.02). Participants from urban areas demonstrated more adequate knowledge but poorer practice regarding organ donation compared to those from rural areas.

Organ donation and transplantation offers a second chance at life for individuals suffering from end-stage diseases. This life saving procedure symbolizes the transfer of life from one person to another. Health-care professionals must possess through knowledge and practice of both the medical and ethical dimensions of organ donation. When doctors are well informed and up to date on these aspects, they can effectively counsel and educate the families of donors and recipients about the importance of organ donation and transplantation. Ensuring that families receive accurate information regarding the medical, legal and ethical considerations without delay is only possible when health-care professionals are fully equipped with comprehensive knowledge on organ donation and transplantation.[10, 12]

Conclusion

In our study, we found that the participants had a satisfactory level of knowledge, showed a positive attitude, but had poor practice regarding organ donation. The majority first heard about organ donation from the internet and were aware that kidney, liver, heart, lung, cornea and bone can be donated. The participants lacked knowledge about 'The Human Organ Transplantation Act' of Bangladesh, as well as about the donation of the intestine, pancreas, and uterus. The majority incorrectly believed that the donor's HLA must be identical to that of the recipient for any organ transplantation and organ transplant recipients are not prone to develop cancer after organ transplantation.

Limitation

1. The study was conducted only at some selected medical colleges among students of 5th year only, so it may not reflect the picture of the entire country.

2. As non-medical students and general people were not included in this study, the results could not be generalized to the community.

Recommendation

1. Details about the 'Human Organ Transplantation Act' of Bangladesh should be included in the medical curriculum.

2. Awareness programs and activities on organ donation should be arranged by government and non-government organizations at regular intervals.

3. A detailed chapter on 'Organ Donation and Transplantation' should be included in the medical curriculum.

4. Further studies including non-medical students and general people should be conducted.

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Conflict of interest: None

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