

## Educational Environment in Operating Theatres of Bangladesh: Views of Surgical Trainees and Trainers

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### Abstract

The quality of the educational environment in the operating theatre is one of the key determinants for the effective training of surgical trainees. This descriptive cross-sectional study was aimed to evaluate the views of postgraduate surgical trainees and their trainers to identify the strength and weaknesses of the educational environment of the operating theatres of Bangladesh. Data were collected by physical means from 349 surgical allied trainees of 14 different disciplines who are having a minimum of three months of working experience in operating theatre as postgraduate trainees. To evaluate the perception of trainees' internationally validated questionnaire STEEM consisting 40 items was used. To highlight the perspective of Bangladesh, an additional self-made questionnaire consisting ten items was also used. Both questionnaires have five answering options (1-5) for each item as per Likert scale. A score of 60% was considered as satisfactory. To have more vivid ideas six sessions of focus group discussion with trainees and 12 in-depth interviews of trainers with minimum five years of teaching experience in his/her specialty from most of the surgical disciplines were also carried out. In this study, the reliability score of STEEM and the self-made questionnaires were 0.757 and 0.730 respectively as determined by Cronbach's alpha. In general, the perception of trainees regarding the educational environment in OT of Bangladesh was grossly satisfactory with a mean score of STEEM  $134.32 \pm 14.05$  (67%) and  $36.80 \pm 5.25$  (73%) for self-made questionnaire. But group D subscale of STEEM (workload, support and supervision) failed to reach satisfaction level with a mean score of  $20.89 \pm 5.36$  (52%) and the difference between the four subgroups of STEEM was statistically significant. The satisfaction level of juniors in group B subscale of STEEM (perception of learning opportunities) was significantly higher than seniors. The perception between trainees of different disciplines was also statistically significant. From focus group discussions of trainees and in-depth interviews of trainers, this study revealed that trainees' felt deprived of 'hands on' training and perioperative briefing either due to the huge workload or long learning curves of the junior faculties. Quality of training is somehow neglected due to physical absence of faculty members after routine office hour and also because of deficient simulation or skill lab. Trainees also claimed that their financial hardship making them bound for extracurricular activities compromising their full-time residential training. The overall educational environment in operating theatres of Bangladesh as perceived by trainees and trainers is satisfactory. To ensure the full engagement of the trainees under the direct supervision of faculties curriculum should be upgraded with the provision of a modern skill lab, workload should be managed and their financial issues need to be addressed sympathetically by the appropriate authority.

**Keywords:** Educational environment, Operating theatre, Surgical trainees and trainers

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### Introduction

In recent times there has been a worldwide movement and a paradigm shift toward competency-based medical education and

training.<sup>1</sup> One of the challenging goals for the surgery allied trainees is to prepare them for the independent practice of surgical procedures which sometimes seems to be

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inadequate to tackle the real-life surgical issues.<sup>2</sup> Surgical education and training have evolved over the centuries but the apprenticeship model still remains the 'gold standard'.<sup>3</sup> With the advent of modern technology and practice, the apprenticeship model also needs to go through evolutionary changes to remain an effective education paradigm.<sup>4</sup> Surgical trainees learning experiences in operation theatres (OT) significantly influences their ability to attain key professional competencies as they usually spend more than half (>10,000 hours) of their clinical training experiences in OT.<sup>5</sup>

The operating theatre (OT) is a unique high-risk environment in which teaching and learning is affected by different factors like - working people (surgeons, anaesthesiologist, nursing and supporting staff, students), case complexity, distractions, stress, balance of faculty & trainees, duty hour restrictions, heightened sense of public accountability, norms of the OT.<sup>6</sup> So it is pivotal to identify the issues and challenges related to attainment of surgical competencies by trainees in OT. And to compare the positive and negative theatre environment an objective measure is also important.<sup>7</sup>

Over the last few decades many questionnaires like DREEM, PHEEM, OREEM, STEEM, ATEEM have been developed to assess the quality of education in general or specific to OT.<sup>8</sup> STEEM (Surgical Theatre Educational Environment Measure) was first developed and validated in UK<sup>9</sup> and tested worldwide in different settings to help the educationist to plan and ensure maximum utilization of precious OT time to reap the best possible outcome from the surgical trainees. Research, however on, how to acquire surgical skills in OT safely, effectively and more efficiently is scarce worldwide and almost nil in the context of Bangladesh. So, research to explore trainees' experiences and expectations and their

trainers' views concerning training to identify key aspects for improving learning and teaching in OT of Bangladesh is far from due.

## Materials and Methods

After obtaining clearance from institutional review board this descriptive type of cross-sectional study was conducted between January 2022 to December 2022 from centre for medical education (CME) of Bangladesh. As measuring tool, we have used STEEM questionnaire which includes 40 items.<sup>9</sup> To embrace the issues related to the OT culture of Bangladesh but not included in STEEM we developed another questionnaire consisting ten items. Both questionnaires had five options to tick by the trainees arranged in five-point Likert scale as strongly agree (5), agree (4), unsure (3), disagree (2), strongly disagree (1). The value over 60% was considered as satisfactory.<sup>7</sup> The STEEM questionnaire is subdivided into four subscales -

- a. Q 1 – Q 13 – Trainees' perception of their trainer and training.
- b. Q 14 – Q 24 – Trainees' perceptions of learning opportunities.
- c. Q 25 – Q 32 – Trainees' perceptions of atmosphere in the operating theatres.
- d. Q 33 – Q 40 – Trainees' perception of supervision, workload and support.

Any volunteer postgraduate surgical and allied trainees (Diploma/FCPS/MS) having minimum three months of OT experience were eligible to participate in the study. Maintaining strict confidentiality for data from 349 surgical trainees of fourteen disciplines from eleven major postgraduate institutions of capital city Dhaka and divisional districts were finally accepted for analysis (table 1). Trainees with  $\leq 24$  months of OT experience were considered as junior trainees whereas trainees with  $> 24$  months of OT experience were considered as senior trainees.

Six focus group discussions (FGD) of trainees of different discipline and twelve in-depth interview (IDI) of their trainers of different discipline were also carried out on seven themes as mentioned in result section to make the study more comprehensive. Data were analyzed by using SPSS software (Version 26). A *p* value of < 0.05 was considered as significant. Data derived from

FGD and IDI were compiled and summarized in narrative form.

### Results

Demography of the participants and distribution of them according to their disciplines are shown in table 1 and table 2 respectively.

**Table-1: Demography of participants according to their sex, course and duration of training (n=349)**

Variables		Number	Percentage
Gender	Male	217	62.2
	Female	132	37.8
Course Distribution	Diploma	58	16.6
	FCPS	88	25.2
	MS	203	58.2
Duration of Training	Senior (> 24 M)	158	45.3
	Junior (≤ 24 M)	191	54.7

**Table-2: Distribution of participants according to discipline (n = 349)**

Discipline	Frequency	Percentage
General surgery	37	10.6
Neurosurgery	17	4.9
Cardiovascular surgery	14	4.0
Hepatobiliary surgery	10	2.9
Urology	13	3.7
Plastic surgery	22	6.3
Orthopaedics	33	9.5
Paediatric surgery	18	5.2
Gynaecology& Obstetrics	70	20.1
Ophthalmology	44	12.6
Otorhinolaryngology	30	8.6
Oral & Maxillofacialsurgery	18	5.2
Thoracic surgery	11	3.2
Colorectal Surgery	12	3.4

**Table-3: Mean scores on each statement of STEEM ± SD (n=349)**

Gp/No	Subscales with Statements	Mean±SD
<b>A</b>	<b>Trainees' perception of their trainer &amp; training</b>	
1.	My teacher has a pleasant personality	4.32±0.78
2.	I get well with my trainer	4.21±0.71
3.	My trainer is enthusiastic with my teaching	3.99±0.83

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4.	My trainer has genuine interest in my progress	4.06±0.87
5.	I understand what my trainer is trying to teach me	4.12±0.64
6.	My trainer's surgical tool is very good	4.15±0.81
7.	My trainer gives me time to practice surgical skill in theatre	3.62±1.00
8.	My trainer immediately takes the instruments away when I do not perform well	2.83±1.14
9.	Before the operation my trainer discusses the surgical technique planned	3.69±1.09
10.	Before the operation my trainer discusses what part of the procedure I will perform	3.57±1.09
11.	My trainer expects my surgical skills to be as good as his/hers	3.83±1.00
12.	My trainer gives me feedback on my performance	3.85±0.86
13.	My trainer's criticism is constructive	3.82±0.95
<b>B</b>	<b>Trainees' perception of learning opportunities</b>	
14.	On this unit the type of operations are too complex for my level	2.58±1.06
15.	The elective operating list has the right case mix to suit my training	3.93±0.85
16.	There are far too many cases on the elective list to give me the opportunity to operate	3.44±1.09
17.	I get enough opportunity to assist	4.03±0.98
18.	There are enough theatre sessions per week for me to gain the appropriate experience	3.65±1.14
19.	More senior trainees take my opportunities to operate	3.41±1.20
20.	The number of emergency procedures is sufficient for me to gain the appropriate experience	3.51±1.20
21.	The variety of emergency cases gives me the appropriate exposure	3.77±1.16
22.	My trainer is in too much of a rush during emergency cases to let me operate	2.98±1.15
23.	I miss out on operative experience because of restrictions on working hours	2.66±1.14
24.	I have the opportunity to develop the skills required at my stage	3.94±0.93
<b>C</b>	<b>Trainee's perception of atmosphere in OT</b>	
25.	The atmosphere of theatre is pleasant	3.75±1.03
26.	In theatre I don't like being corrected in front of medical students, nurses and residents	3.16±1.29
27.	The nursing staff dislike it when I operate as the operation takes longer	3.31±1.18
28.	The anaesthetists put pressure on my trainer to operate him/herself to reduce anesthetic time	3.24±1.27
29.	The theatre staff are friendly	3.86±0.95
30.	I feel discriminated against in theatre because of my gender	2.14±3.06
31.	I feel discriminated against in theatre because of my race	1.81±1.08
32.	I feel part of a team in theatre	4.21±0.78
<b>D</b>	<b>Trainee's perception of supervision, workload and support</b>	
33.	I am too busy doing other work to go to theatre	2.32±1.15
34.	I am often too tired to get the most out of theatre teaching	2.53±1.17
35.	I am so stressed in theatre that I do not learn as much as I could	2.44±1.12
36.	I am asked to perform operations alone that I do not feel competent at	2.15±1.03

37.	When I am in theatre, there is nobody to cover the ward	2.44±1.14
38.	I get bleeped during operations (e.g. resolving ward issues during OT hours)	2.82±1.11
39.	The level of supervision in theatre is adequate for my level	3.54±1.11
40.	Theatre sessions are too long	2.66±1.04
<b>No.</b>	<b>Statement</b>	<b>Mean±SD</b>
41.	I get the opportunity to do counselling (pre & postoperative) of patients and their families.	4.40±0.71
42.	I am asked to accompany the patient to and from the OT.	3.75±0.95
43.	It is a common practice to check the patient's ID and diagnosis before surgery.	4.28±0.92
44.	Standard protocol is maintained for hand scrubbing and other routine short procedure.	4.11±0.93
45.	Ratio of trainers and trainees are adequate.	3.32±1.21
46.	There are adequate teaching aid/ facilities (e.g. white board, TV monitor & simulators) in OT.	3.03±1.32
47.	Use of mobile phone in OT during surgery is beneficial.	2.96±1.15
48.	Playing music within OT during surgery relieves stress during surgery.	3.31±2.48
49.	There are adequate refreshment facilities (e.g. washroom & tea room) within OT complex.	3.27±1.35
50.	I routinely participate in documentation of OT events (Op notes, post op notes etc.).	4.37±0.68

Table 3 shows the mean score of each statement of STEEM. The highest score (4.32±0.78) was awarded by the trainees to statement number 1 i.e. "My teacher has a pleasant personality" whereas lowest score (1.81±1.08) was given to statement number 31 i.e. "I feel discriminated against in theatre because of my race". Regarding OT culture

in the context of Bangladesh statement no. 41 i.e. "I get the opportunity to do counseling (pre & postoperative) of patients and their families" got the most positive score 4.40±0.71 and the statement no. 47 i.e. "Use of mobile phone in OT during surgery is beneficial" got the least score (2.96±1.15).

**Table-4: Mean(±SD) scores and percentages of perception based on STEEM (including subscales) and also, BD context (n=349)**

Group subscale	Questions	Mean±SD	Percentage	p-value by ANOVA test
A	1-13	50.05±7.16	77.06±10.97	<0.0001 <sup>s</sup>
B	14-24	37.91±5.09	68.93±9.25	
C	25-32	25.47±5.01	63.32±10.09	
D	33-40	20.89±5.36	52.22±13.40	
Overall	1-40	134.32±14.05	67.16±7.02	
BD context	41-50	36.80±5.25	73.60±10.50	-

Table 4 shows the trainee's overall perception score of the education environment in OT in general is 134.32±14.05 (67.16±7.02 %) out of

maximum 200. The percentage of group A (77.06±10.97) is highest while in group D it is lowest (52.22±13.40). The difference of perception between the group subscales is

also statistically significant ( $p < 0.0001$ ). And the overall mean score on the same in BD context is  $36.80 \pm 5.25$  ( $73.60 \pm 10.50$ ).

Difference of overall perception between gender is insignificant but considering the subscale only group D (supervision, support & workload) difference of perception between male and female is statistically significant ( $p = .008$ ) (table 5). No significant difference was found between the perception of participants of different courses (table 6). Both senior and junior trainees are satisfied with the educational environment in OT and their difference in perception is not significant except in group

B subscale (learning opportunities) which shows juniors are more satisfied than senior trainees ( $p = 0.019$ ) (table 7).

Table 8 showing trainees of Otorhinolaryngology scored the maximum ( $140.23 \pm 14.34$ ) while trainees of cardiovascular surgery scored the minimum ( $121.93 \pm 10.93$ ). When compared between disciplines the difference of overall perception and difference of subscales A (perception of trainees on trainer and training) and B (trainees' perception on learning opportunities) were found to be statistically significant ( $p < 0.05$ ).

**Table-5: Overall mean score  $\pm$ SD according to gender (n=349)**

Group	Statement no.	Male (n=217) Mean $\pm$ SD	Female (n=2132) Mean $\pm$ SD	p-value
A	1-13	50.21 $\pm$ 7.39	49.78 $\pm$ 6.78	0.590 <sup>ns</sup>
B	14-24	37.87 $\pm$ 5.53	37.98 $\pm$ 4.29	0.840 <sup>ns</sup>
C	25-32	25.86 $\pm$ 5.57	24.83 $\pm$ 3.85	0.063 <sup>ns</sup>
D	33-40	21.48 $\pm$ 5.54	19.92 $\pm$ 4.92	0.008 <sup>s</sup>
Over all	1-40	135.42 $\pm$ 15.22	132.52 $\pm$ 11.70	0.061 <sup>ns</sup>
BD context	41 - 50	37.01 $\pm$ 5.45	36.45 $\pm$ 5.45	0.339 <sup>ns</sup>

**Table-6: Overall mean score  $\pm$ SD of according to course (Diploma/FCPS/MS) (n=349)**

Group	Statement no.	Course			p-value
		Diploma (n=58) Mean $\pm$ SD	FCPS (n=88) Mean $\pm$ SD	MS (n=203) Mean $\pm$ SD	
A	1-13	50.97 $\pm$ 6.01	50.43 $\pm$ 7.25	49.62 $\pm$ 7.41	0.379 <sup>ns</sup>
B	14-24	38.22 $\pm$ 4.32	38.70 $\pm$ 4.92	37.48 $\pm$ 5.34	0.150 <sup>ns</sup>
C	25-32	24.78 $\pm$ 3.15	25.92 $\pm$ 4.44	25.48 $\pm$ 5.63	0.403 <sup>ns</sup>
D	33-40	20.53 $\pm$ 5.59	21.07 $\pm$ 5.57	20.91 $\pm$ 5.22	0.838 <sup>ns</sup>
Over all	1-40	134.50 $\pm$ 11.99	136.13 $\pm$ 15.24	133.49 $\pm$ 14.04	0.338 <sup>ns</sup>
BD context	41 - 50	38.19 $\pm$ 4.11	36.53 $\pm$ 4.91	36.52 $\pm$ 5.62	0.087 <sup>ns</sup>

**Table-7: Overall mean score  $\pm$ SD according to duration of training (n=349)**

Group	Statement no.	Senior trainee	Junior trainee	p-value
		>24 months (n=158) Mean $\pm$ SD	$\leq$ 24 months (n=191) Mean $\pm$ SD	
A	1-13	49.49 $\pm$ 7.76	50.50 $\pm$ 6.60	0.190 <sup>ns</sup>
B	14-24	37.22 $\pm$ 5.75	38.49 $\pm$ 4.40	0.019 <sup>s</sup>
C	25-32	25.51 $\pm$ 4.24	25.44 $\pm$ 5.58	0.893 <sup>ns</sup>

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D	33-40	21.11±5.13	20.70±5.56	0.475 <sup>ns</sup>
Over all	1-40	133.34±14.43	135.14±13.71	0.234 <sup>ns</sup>
BD Context	41 - 50	36.55±5.85	37.01±4.70	0.421 <sup>ns</sup>
ns= not significant				

**Table-8: Overall Mean score ±SD of STEEM according to discipline (n=349)**

Discipline	No. (n)	Mean ± SD					
		Group (Statements no.)					
		A (1-13)	B (14-24)	C (25-32)	D (33-40)	Overall (1-40)	BD Context (41 – 50)
General Surg	37	48.76±6.84	38.89±4.13	25.78±4.26	21.51±5.06	134.95±10.10	35.08±3.83
Neurosurg	17	49.88±6.79	34.53±4.85	24.88±4.34	19.88±4.47	129.18±9.42	35.76±5.43
Cardiovascular Surg	14	43.93±6.92	33.86±4.97	25.07±1.73	19.07±4.75	121.93±10.93	35.93±11.25
Hepatobiliary Surg	10	49.40±5.85	33.40±7.88	26.80±5.65	20.40±8.66	130.00±22.50	41.70±4.64
Urology	13	45.31±6.97	36.08±5.92	25.08±4.97	22.92±7.65	129.38±19.88	35.46±6.13
Plastic Surg	22	52.45±4.60	37.27±4.29	24.82±2.67	19.86±4.35	134.41±9.12	37.36±4.18
Orthopaedic Surg	33	49.76±9.43	39.58±4.52	25.18±3.67	22.36±6.41	136.88±15.27	37.33±4.88
Paediatric Surg	18	50.78±7.95	39.61±5.30	25.39±3.50	20.39±4.95	136.17±8.83	35.06±5.48
Gynae & Obstetrics	70	50.81±6.17	38.74±3.62	24.06±3.90	19.37±5.02	132.99±12.35	36.64±4.82
Ophthalmology	44	50.55±7.24	37.48±5.08	24.98±3.65	21.68±5.14	134.68±13.22	37.16±4.99
Otorhinolaryngology	30	51.60±5.69	39.93±4.97	26.77±4.56	21.93±3.74	140.23±14.34	38.37±3.84
OMF Surg	18	47.72±8.86	36.94±6.26	29.11±13.79	21.33±6.17	135.11±22.54	36.89±5.59
Thoracic Surg	11	50.27±6.51	38.64±5.43	27.55±3.80	21.82±4.31	138.27±13.39	37.55±4.55
Colorectal Surg	12	55.42±5.74	36.75±6.28	26.75±4.39	21.08±5.88	140.00±15.38	36.92±4.83
<i>p</i> - value	----	0.003 <sup>s</sup>	<0.001 <sup>s</sup>	0.053 <sup>ns</sup>	0.232 <sup>ns</sup>	0.014 <sup>s</sup>	0.083 <sup>ns</sup>

Throughout the paper, the responses are graded as FGD (Group no. Participant no.) e.g. FGD (G1P1) and IDI (serial number of participants) e.g. – IDI 1. Only important views are included and repetitions are avoided.

#### Findings of FGD and IDI:

#### Theme 1: Views of trainees/trainers on trainers/trainees and training

FGD (G1P5), IDI 5 – Training time compromised due to official or personal extracurricular activities.

FGD (G3P3) – No system of teaching basic surgical skills before participating in the main operation

FGD (G5P4) (G6P1) - Critical cases needing emergency admission/surgery are turned down due to lack of anaesthesiologist and or ICU support.

FGD (G3P2) – Two types of courses (FCPS/MS) with different modules controlled by the same

faculty.

IDI 4 – Training module not structured. Assessment is still subjective.

#### Theme 2: Views of trainees/trainers on learning opportunities in OT

FGD (G2P1) (G4P5) (G5P2) – Senior/favourite trainees and junior faculties take the most opportunities to become first-hand or to do surgeries ignoring juniors.

IDI 9 – No emergency OT or ICU service as there is a scarcity of anaesthesiologists

#### Theme 3: Views of trainees/trainers on overall atmosphere in OT

FGD (G4P4) – Basic facilities like change room, washroom, and tea room are not up to the mark.

FGD (G6P5) (G4P1) – No classroom or TV screening facility within OT.

IDI 2,4,6,7,8,9,10 – Lack of logistics in terms of modern equipment and expert manpower including anaesthesiologists

**Theme 4: Views of trainees/trainers on supervision, workload, and support**

FGD(G6P1) (G4P3), IDI 5,8,9,11 – After office hours (during emergency) trainees are usually not supervised physically by faculty members but by senior trainees

FGD(G2P7), IDI 6 – Log books are not properly maintained.

FGD(G4P3) (G6P5), IDI 2,3 – Pre and per-operative briefing, post-operative feedback deficient.

FGD(G6P2), IDI 2,3,5 -Too much workload hampers systematic/quality teaching by faculties.

IDI 11 – No system of training of basic surgical skills before actively joining OT which prolongs the learning curves.

**Theme 5: Views of trainees/trainers on main challenges in the context of Bangladesh**

FGD (G4P5), IDI 1,4,5,9 – No surgical skill lab to learn basic or advanced surgical skills.

FGD (G4P6) (G6P5) – Too much extracurricular involvement to meet financial hardship.

IDI 2,3,11,12 - Training of the trainers (TOT) neglected.

IDI 3,4 – Unstructured and old curriculum which needs periodic development

**Theme 6: Views of trainees/trainers regarding ways of improvement**

FGD(G3P1)–Specific trainee should be detailed for specific operations from the long OT list-so that he/she can get prepared beforehand and actively participate.10-20% of cases can be dealt with as academic and adequately discussed during operation.

IDI 11,12 - Mandatory training of the trainers with periodic evaluation

FGD (G3P1), IDI 9,11, 12 – Establishment of classroom within OT complex with a digital connection

(TV monitor) with operating room

IDI 5,11,12 – Development of institutional practice so that faculties and trainees remain within the hospital 24/7.

**Theme 7: Any special point(s) you like to add**

FGD(G4,5,6) – Authority should sympathetically look into the financial issues of the trainees.

IDI 5,8,12 – Delegation of more administrative and financial power to the head of the departments to ensure education friendly environment in OT.

IDI 12 – Professional organizations like society of surgeons, Bangladesh (SOSB) can arrange more programs to train the trainers regarding the teaching process in OT

IDI 12 – Preanaesthetic room in OT should be activated to reduce changeover time in OT.

IDI 5 - Morbidity and mortality related to OT should be routinely discussed with all disciplines concerned. System of giving awards/incentives for extraordinary performance by both trainer and trainees.

**Discussion**

The overall reliability score of the STEEM as found in this study is 0.757 which is quite satisfactory but lesser than other studies.<sup>9,10</sup>

The reliability scores of the subgroups were also satisfactory (>0.60). The self-made questionnaire had also a good reliability score (0.730). The overall score of STEEM as perceived by surgical trainees was 134.32±14.05 (67%). Taking 120 (60%) as the cutoff mark as an indicator of satisfaction,<sup>7</sup> it can be said that the educational environment in OTs of Bangladesh is grossly satisfactory. But in group subscales D group (trainees' perception on supervision, workload, and



support) shows their dissatisfaction ( $20.89 \pm 5.36$  or 52%) which needs to be addressed. Although the perception score of other subgroups are satisfactory but the difference between subgroups is statistically significant.

Consistent with other studies<sup>10,11</sup> this study also shows females are less satisfied than males ( $19.92 \pm 4.92/40$  vs  $21.48 \pm 5.54/40$ ) regarding the perception of the most crucial factor (group D) i.e. supervision and support by the faculties or the system. A residency programme in surgery is a challenge to smoothly balance professional and family life, especially for women. As women are increasingly choosing surgery as a career it is important for faculties to model a balanced lifestyle and to inculcate it in surgical residents.<sup>12</sup>

Contradictory to other studies<sup>6,13</sup> senior trainees are marginally less comfortable with the learning environment of OT than juniors (STEEM score – 133.34 vs 135.14) although not statistically significant. Senior trainees get more responsibility, autonomy, learning opportunities, and understanding of the OT culture.<sup>7</sup> Juniors tend to be more sensitive about senior trainees and junior faculties who usually deprive them of having adequate practical exposure in OT. This is a common feeling globally as mentioned in another study.<sup>13</sup>

Statement-wise in this study, the first statement of STEEM – “My teacher has a pleasant personality” got the highest mean score ( $4.32 \pm 0.78$ ). As a whole trainees’ perception regarding their trainer and training (subscale group A) was best (77%) when compared to other subscales which is consistent with another study.<sup>14</sup> It may be because of trainees were a little apprehensive to express their true feelings (as they expressed during FGD) about their trainers, although the data collection procedure was absolutely confidential. The statement – “I feel discriminated against in theatre because

of my race” scored the minimum ( $1.81 \pm 1.08$ ). It is because of racial homogeneity that prevails in this part of the world. While considering the Bangladesh context of OT culture the statement – “I get the opportunity to do counseling” got the best score ( $4.40 \pm 0.71$ ). Although trainees are considered as the key persons for counseling but faculties should also give some time to teach the trainees the ideal way of doing that, as expressed by a trainee during FGD. The statement – “Use of mobile phone in OT is beneficial” got the minimum score ( $2.96 \pm 1.15$ ) as this can be annoying to others including the awake or sedated patient under regional anaesthesia.

As per the culture of the medical practice of Bangladesh, both trainees and trainers remain busy with personal issues like private practice to meet the financial hardship after scheduled office hours, during which emergency patients of government training hospitals are covered by one faculty member (mostly over the phone) and few trainees of different phase. So, practically trainees get exposed to emergency cases under the supervision of senior trainees who is not qualified enough to do so,<sup>4</sup> and the scenario is somehow similar in Iran.<sup>15</sup> During an in-depth interview, one faculty suggested that an institutional or single centre practice can balance both learning opportunities and the financial solvency of all concerned. Faculty who participate strongly in academic activities also need to be acknowledged in terms of monetary benefits and or other incentives like promotion.<sup>4,16</sup>

For basic surgical skills, there is no formal training programme inside or outside OT which prolongs the learning curve of the trainees and creates a lack of confidence initially. Skill lab facilities are very scarce in most of the institutions of Bangladesh as expressed by both trainees and trainers. The simulation of surgical procedures is

advocated as a patient safety issue in time-constraint surgical education.<sup>17</sup>

Most of the participants in FGD of this study opined in favour of standard pre and per-operative briefing, postoperative feedback, mortality/ morbidity meeting in quality improvement endeavor of trainees which is lacking in most of the institutions due to huge workload as expressed by trainees and admitted by some faculty members and this finding is consistent with another study.<sup>18</sup>

Due to limited tertiary-level treatment facilities in Bangladesh huge workload is creating a substantial negative impact on the educational environment in OT. Diwadkar and Jelovsek (2010)<sup>6</sup> also found that 71% of trainees felt that service always gets more priority than education within OT. Pressure from anaesthesiologists and nursing staff to complete the long OT list in time is also a contributing factor to discourage the faculties to teach the art of surgery during operation.<sup>6</sup> Even with such a huge workload, we can't ignore the educational requirement of the trainees. One participant of FGD in this study suggested at least one or two cases from a long OT list of the day should be treated as 'academic' with elaborative discussion and 'hands-on' training.

Per operative visualization of the procedure along with briefing is an important method of teaching in surgical practice. But because of sterility issues, the unwillingness of surgeons,<sup>19</sup> time constraints, and poor logistics sometimes these are neglected. In most of the OT complexes of Bangladesh, there is no separate classroom for the trainees with screening facilities of the operation which is a must for effective surgical education as expressed by faculties and also trainees. Faculties also suggested having an ideal and active pre-anaesthetic room to reduce the loss of precious OT training time for the trainees.

A transparent logbook can ensure the number of procedures performed by the

trainees<sup>20</sup> but there is no evidence that a logbook alone can guarantee the skill required by the surgical resident.<sup>21</sup> Subjective and unstructured assessment of surgical skill is a problem in our education system that may discourage the trainees to be more proactive in OT activities as faculties admitted during their interviews which is consistent with another study.<sup>15</sup>

In most of the institutions, OTs are not equipped with expert manpower, modern equipment and other supporting facilities like standard change room, washroom, and tea room which may have an indirect impact on the educational environment of OT. In this study perceptions of the educational environment as measured by STEEM between trainees of different disciplines were found to be statistically significant in group A and B. In Bangladesh, there are different curriculums for courses like FCPS and MS. In some institutions, FCPS-qualified trainers are in charge of the training of MS trainees and vice versa which is making the faculties confused about the trainee's curricula or requirements.

That's why training of the trainers (TOT) is mandatory along with periodic evaluation as highlighted by both trainees and trainers. As the OT environment has some special challenges which contradict smooth teaching, faculties need to be well-trained. Training programmes need to educate attending surgeons on how to effectively use adult learning theories and strategies.<sup>3</sup> In Bangladesh, training opportunities of trainers are deficient and mostly voluntary not mandatory. Surgical associations usually arrange training to improve the surgical skills of the surgeons but not the teaching skill of the faculties which should be preferably initiated by these associations.<sup>16</sup>

Most of the studies worldwide carried out on the perception of medical students and interns regarding the educational environment of OT. In this study,

postgraduate trainees were chosen because undergrad students or interns are not committed to their careers, remain confused about their responsibilities, and are apprehensive of their mistakes in an unknown and sometimes frightening environment. Trainers are also not sure what and how to teach the bulk of students at the peak hour of surgery. The learning environment mostly depends on the faculty members working in the OT, their teaching strategies, OT culture, curriculum, assessment system, and administration. Willingness to let trainees operate is the number one criterion to be a successful surgical trainer.<sup>22</sup> As such the learning environment differs from unit to unit, discipline to discipline, institution to institution, and country to country even from time to time.

To evaluate the educational environment of OT no single tool is adequate enough. So, in this study multiple tools from multiple sources like STEEM, additional questionnaires highlighting Bangladeshi OT culture and FGD for trainees and in-depth interviews of the faculty members were used to get a relatively more comprehensive picture. To add to this strength, a maximum number of trainees of almost all disciplines of surgery of all the major postgraduate institutions of the capital city Dhaka and also from outside Dhaka were included. The 1-5 (instead of 0-4 coding of the original Likert system) coding of STEEM overestimates (up to 20%) the scores especially when the overall educational environment is worst.<sup>23</sup> This limitation of STEEM may sometimes inadvertently depict the unreal picture of the educational environment of the OT.

## Conclusion

Based on the reliable and authentic educational environment assessment tools used in this study, it can be said that the gross educational environment of OT in

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Bangladesh is satisfactory. This study revealed that surgical trainees are to some extent deprived of round-the-clock good mentorship and hands-on training due to excessive workload, financial hardship and also outdated curricula and the absence of modern skill labs. Areas to address by both curriculum designer and faculty members include setting an explicitly structured curriculum, fostering a culture of confidence in trainees and ensuring an outcome-based assessment of practical skills learned in OT. Conflict of Interest: There is no conflict of interest.

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