ISSUES AND REMEDIES RELATED TO LEARNING ENVIRONMENT OF STUDENTS DURING MATERNAL, NEONATAL AND CHILD HEALTH CLERKSHIP

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ABSTRACT

Objective: To gain insight into learning-environment of Maternal Neonatal and Child Health community clerkship, using Dundee Ready Educational Environment Measure questionnaire and focus group discussion to improve students' quality of learning.

Study Design: Sequential Mixed Method Study.

Place and Duration of Study: Primary Centers (Aga Khan Health Services, Pakistan) and Secondary Center (Aga Khan University), from Nov 2014 to Oct 2015.

Material and Methods: All consenting third-year MBBS students after completing maternal neonatal and child-health (MNCH) rotation anonymously filled the Dundee Ready Educational Environment Measure (DREEM) questionnaire. Data was entered in MS Excel 2013 and SPSS version 21. Descriptive statistics were calculated such as frequencies, mean and standard deviation of the total/subscale scores. Independent samples t test was used to identify gender-related differences among DREEM scores with *p*-value of < 0.05 as statistically significant.

Focus Group Discussion (FGD) was conducted with all consenting facilitators (Faculty/Lady Health Visitors). Thematic analysis of qualitative data was done using constant iterative approach.

Results: From a total of 99 students, 78 (78.8%) consented, of which 36 (46.2%) were males and 42 (53.8%) females. Mean total DREEM score was 126.26/200 (63.13%) indicating a more positive learning environment. Total means with percentages and interpretation of subscale scores showed 'Students Perception of Learning (SPOL)', 28.92/48 (60.25%) indicating more positive approach; 'Students Perception of Teachers (SPOT)', 28.58/ 44 (64.95%) indicating teachers are moving in right direction; 'Students Academic Self-Perception (SASP)', 20.64/32 (64.5%) indicating students felt positive academically; 'Students' Perception of Atmosphere (SPOA)' 31.17/48 (64.93%) indicating positive learning-atmosphere and Students' Social Self-Perception (SSSP), 16.93/28 (60.46%) showing not-too-bad social-environment. Thus, DREEM results showed, students perceived their learning environment to be overall positive.

As a composite score in the five domains of educational environment no statistically significant difference was found between males and females. (SPOL: *p* value 0.655; SPOT: *p* value 0.760; SASP: *p* value 0.685; SPOA: *p* value 0.245; SSSP: *p* value 0.280).

Common issues identified through DREEM and student-facilitators through FGD were grouped into three themes; 'Challenges faced', 'Student-learning facilitation' and 'Way-forward'. Triangulation of data from DREEM questionnaire and FGD indicated validation of outcomes.

Conclusion: MNCH clerkship is a rotation, in a low/middle income country, in early years of inception. Students are satisfied but there is scope for improvement. This evaluation helped identify problem areas to enable improvement of program and inspire other institutions to arrange community clerkships.

Keywords: Community-based clerkship, Community based medical education, DREEM, Learning environment.

INTRODUCTION

Students' perceptions of learning environment have an impact on their satisfaction with the course, perceived well-being, aspirations and academic achievement[1]. It is important to regularly assess educational environment to sustain high-quality activities and improve ones' needing attention[2]. Dundee Ready Education Environment Measure (DREEM) Inventory is a validated, non-culturally specific tool to measure students' perceptions regarding learning environment for medical schools and other health

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professions[1]. It has been used to identify strengths/weaknesses of teaching programs, investigate impact of new curriculum on students' perception of educational-environment, compare learning-environment of different medical education institutions etc[1].

Community-based medical education (CBME) is an innovative approach to medical education across the globe[3]. High infant and maternal mortality rates are amongst larger health issues in Pakistan[4]. A training needs assessment to recognize deficiencies in quality of Maternal Neonatal and Child Health (MNCH) care in Pakistan indicated serious gaps in knowledge amongst doctors working in primary/secondary health centers. This indicates suboptimal training of students on essential MNCH issues[5]. To address these concerns, Division of Women and Child Health, Aga Khan University Hospital (AKUH) initiated MNCH community-based clerkship for undergraduate medical students.

Challenges in implementing CBME program in Pakistan include lack of needs assessment, faculty buy-in, institutional prepare-dness, commitment of institutional heads and student involvement[6]. MNCH clerkship is one of the first programs in Pakistan that aims to involve undergraduate students in provision of basic, low-cost care to women/children in community. However, research on students' perceptions of experience in these settings is limited[7]. Open-ended survey questionnaires[8] Ramsden questionnaire[9] and structured reports[7] have been used for evaluation. Few studies have used DREEM in this context[10].

This is one of the few studies in Pakistan with focus on community rotation. It is conducted with aim of getting insight into students' perceptions of learning environment during MNCH clerkship, for improving quality of rotation.

MATERIAL AND METHODS

This sequential mixed-method study was carried out at AKUH from November 2014-October 2015 to evaluate MNCH clerkship program for third year medical students after formal approval from ethical review committee.

Sample size and sampling technique: Non-probability convenience sampling technique was used to select entire class of 99 students (n=78 consented to complete the DREEM ques-tionnaire). Non-probability maximal varia-tion sampling technique was used to identify six faculty members and one LHV for the FGD.

DREEM questionnaire was used for quantitative and FGD was used for qualitative assessment.

The MNCH course implemented in 2011, is a four-week clerkship designed to give students' exposure to maternal/children's health-care in primary health centers and secondary hospital. Students are rotated at primary health centers and secondary hospital affiliated with AKUH. Student groups of 10-12 rotate under supervision of Faculty, two Lady Health Visitors (LHVs) and Medical Officer. All faculty members are trained in student - centered learning, through 'Introductory Course on Health Professions Education (HPE)' conducted at AKUH.

Learning strategies include clinical rotations, tutorials, student-presentations and students-conducted community health-education sessions. Assessment is through structured continuous evaluation. Final assessment is through Objective Structured Clinical Examination. This program is being evaluated informally since its inception, through anonymous questionnaires and verbal feedbacks from students at end of each rotation.

Study comprised two phases. In phase-I, students were asked to fill DREEM questionnaire. In phase-II, FGD with faculty and LHV was performed to get in-depth insight into possible loop holes in the program so that it can be continued successfully in the future.

Consenting students completed the DREEM questionnaire at end of their clerkship. Confi-dentiality was ensured by using serial study identification numbers. DREEM inventory has 50

items, scored from 0-4 on a 5-point scale as follows: 'Strongly agree'', ''Agree'', ''Uncertain'', ''Disagree'' and ''Strongly disagree''. Reverse coding is for items 4, 8, 9, 17, 25, 35, 39, 48 and 50. Statements are subdivided to provide students' views of five different aspects of educational environment, 'Perceptions of Learning' (SPOL), 'Perceptions of Teachers' (SPOT), 'Academic Self-Perception' (SASP), 'Perceptions of Atmosphere' (SPOA) and 'Students' Social Self-Perception' (SSSP)[1].

Second phase comprised of 60-minute FGD using semi-structured guide, facilitated by medical educationist. This was conducted at secondary center, involving consenting faculty members and LHV. Results were triangulated with quantitative data collected through DREEM. FGD was audio recorded after informed consent and field notes were taken. The semi-structured guide contained following sections.

- Student-learning
- Course-organization
- Learning-atmosphere
- Areas requiring re-enforcement
- Questions based on problem-areas identified through DREEM

Data generated through DREEM was analyzed through SPSS version 21 to identify frequencies mean and standard deviation of the total and subscale scores of DREEM. Categorical variables were presented by frequency and percentage. Independent samples t-test was used to identify gender related differences between the five subscales of DREEM. A p value of <0.05 was taken to be statistically significant.

Audio-recorded FGD was transcribed with help of field notes. Transcription was analyzed by identifying different categories as themes representing gist of the matter and trends to classify data chunks. Data chunks under each theme were looked for word frequency count representing the gist by using constant iterative approach for any possible modification in the themes by matching them with research question by all researchers to put the interpretations to test of plausibility and verifi-ability. Comments verbatim (Labenswelt) representing themes and trends were identified to establish trustworthiness of interpretations[11,12].

Table-I: Total DREEM scores and subscale scores with percentages and interpretation.

DREEM Subscales	Score obtained	Total score	Percentage (%)	Interpretation of scores
SPOL*	28.92	48	60.25	More positive approach
SPOT+	28.58	44	64.95	Teachers moving in right direction
SASP++	20.64	32	64.5	Feeling more on positive side
SPOA#	31.17	48	64.93	More positive atmosphere
SSSP**	16.93	28	60.46	Not too bad
Total DREEM	126.24	200	63.12	Positive learning environment

*Students perception of learning; +Students perception of teachers; ++Students academic self-perception; #Students perception of atmosphere; **Students social self-perception

Table-II: Individual item analyses of DREEM showing values less than 2.

Item No.	DREEM Item	Mean	SD
25	Teaching over emphasizes factual learning	1.99	1.013
12	Course is well time-tabled	1.95	1.338
3	There is good support system for students who get stressed	1.92	1.029
14	I am rarely bored in this course	1.74	1.156

RESULTS

Results of DREEM: From a total of 99 students, 78 (78.8%) consented to complete the

questionnaire of which 36 (46.2%) were males and 42 (53.8%) females. Internal consistency reliability was measured by Cronbach's alpha coefficient. Overall reliability coefficient alpha was 0.927 indicating that DREEM questionnaire is a reliable instrument in context of measurement of educational-environment of MNCH rotation. Total DREEM scores and subscale scores with percentages and interpretation of subscale scores are shown in table-I.

Appendix-1: Individual item analyses of DREEM.

Mean and standard deviation (S.D.) of individual DREEM items (Total Students=78)			
	DREEM Questions (50)		
	SPOL(12 items)	Mean	SD
1	I am encouraged to participate during teaching sessions	2.83	0.692
7	Teaching is often stimulating	2.46	1.041
13	Teaching is student centered	2.37	0.995
16	Teaching helps to develop my competence	2.51	0.964
20	Teaching is well focused	2.37	1.046
22	Teaching helps to develop my confidence	2.51	0.950
24	Teaching time is put to good use	2.40	1.103
25	Teaching over emphasizes factual learning	1.99	1.013
38	I am clear about the learning objectives of the course	2.19	1.117
44	Teaching encourages me to be an active learner	2.49	1.016
47	Long- term learning is emphasized over short -term learning	2.63	0.791
48	Teaching is too teacher centered	2.17	0.999
SPOT(11 items)			
2	Facilitators are knowledgeable	3.08	0.717
6	Facilitators encourage me to adopt a patient- centred approach to learning	2.68	0.860
8	Facilitators ridicule the students	2.63	1.141
9	Facilitators are authoritarian	2.14	1.066
18	Facilitators have good communication skills with patients	2.85	0.774
29	Facilitators are good at providing feedback to students	2.32	1.051
32	Facilitators provide constructive criticism	2.60	0.902
37	Facilitators give clear examples	2.64	0.911
39	Facilitators get angry in teaching sessions	2.47	1.078
40	Facilitators are well prepared for teaching sessions	2.85	0.740
50	Facilitators are irritated by students	2.33	1.053
SASP (8 items)			
5	Learning strategies that worked before will work now	2.49	0.950
10	I am confident about passing in this clerkship	2.79	0.691
21	I feel I am being well prepared for my profession	2.41	0.986
26	Last year's work has been good preparation for this year's work	2.08	1.042
27	I am able to study all I need	2.62	1.060
31	I have learnt a lot about empathy in my profession	3.15	3.276
41	My problem solving skills are being well developed here	2.40	0.931
45	Much of what I learnt seems relevant to healthcare career	2.71	0.982
SPOA (12 items)			
11	Atmosphere is relaxed during teaching in clinics	2.87	0.903
12	Course is well time tabled	1.95	1.338
17	Cheating is a problem in this rotation	2.67	1.147
34	Atmosphere is relaxed during tutorials	2.73	0.935
30	There are opportunities to develop interpersonal skills	2.51	1.066
33	I feel comfortable in class socially	2.88	0.683
23	Atmosphere is relaxed during student presentations	2.86	0.817
35	I find the experience disappointing	2.22	1.077
36	I am able to concentrate well	2.78	0.658
42	Enjoyment outweighs stress of the course	2.47	0.977
43	The atmosphere motivates me as a learner	2.47	1.078
49	I feel able to ask the questions I want	2.76	0.885
SSSP (7 items)			
3	There is good support system for students who get stressed	1.92	1.029
4	I am too tired to enjoy the course	2.21	1.199
14	I am rarely bored in this course	1.74	1.156
15	I have good friends on this course	2.95	0.896
19	My interaction with my peers, seniors and juniors is good	2.82	0.833
28	I seldom feel lonely	2.42	1.099
46	My working environment is pleasant	2.87	0.745

Guidelines for interpretation of scores on individual items, subscales and overall DREEM were followed. Students' perceptions towards the educational environment were positive for all five DREEM subscales.

Four items, as depicted in table-II had values less than 2, showing areas of concern indicating further investigation and improvement of timetable and more student support for stressful environment. All other items scored between 2.08 to 3.15 indicating aspects that are positive but can be improved.

Complete DREEM scores for each individual item are shown in Appendix 1.

Appendix-2: Independent Samples t-test for gender-comparison in the five domains of educational environment.

	Domain	Gender	N	Mean	Std. Deviation	Mean Difference	*p*-value
1	SPOL	Female	42	29.2143	5.62458	0.71429	0.655
		Male	36	28.5000	8.36148		
2	SPOT	Female	42	28.4048	5.19408	-0.40079	0.760
		Male	36	28.8056	6.36427		
3	SASP	Female	42	20.8810	4.54357	0.51984	0.685
		Male	36	20.3611	6.67256		
4	SPOA	Female	42	32.0238	5.76147	1.82937	0.245
		Male	36	30.1944	7.98863		
5	SSSP	Female	42	17.3810	3.48483	0.96429	0.280
		Male	36	16.4167	4.34495		

As a composite score in the five domains of educational environment no statistically significant difference was found between males and females. (Appendix 2).

Results of FGD: Common issues highlighted through DREEM and student facilitators were grouped into three themes. Table-III shows prevalent themes and identified trends within the themes with corresponding comments verbatim. It also shows frequency of various trends as they appear under each theme.

Triangulation of data regarding learning environment from DREEM questionnaire and FGD indicate validation of outcomes.

DISCUSSION

Reforms in medical education and recognition of complementary roles of hospital and primary care, have led to recommendation for increase in student exposure to primary-care to sensitize them to preventive aspects of medicine, help them gauge effects of socio-economic status on health and prepare them as future patient advocates[13,14]. Variations of CBME activities have therefore been introduced into health education programs across the world.

As indicated by high overall score (126.26/200) of DREEM inventory, students find positive learning- environment during MNCH rotation. This is corroborated by our facilitators who felt that most MNCH course objectives are met in clinics and through group discussions. (Table-III comment 6). Positive factor in our study was the important role that students played in community clinics for promotion of health and prevention of illness through health education sessions. (Table-III, comment 7). This was not seen in study population of Ladhani et al[15] DREEM inventory has mostly been used in medical college settings within university and associated hospital. Few studies conducted for student courses in rural and urban community settings indicate equivalent or slightly lower scores[16,17] The results of such studies when examined closely indicate robustness of health systems to be an important factor in determining student satisfaction. Thus, when teaching sites are located in Germany and in the Rural Clinical School of Western Australia (RCSWA) there are high scores indicating a more positive perception of students regarding learning environment in community[10,18]. A study in Pakistan comparing

difference between learning environment of medical colleges situated in urban and remote areas indicated many problems in remote colleges which include weak associated health system[19].

Students perceived teaching to over-emphasize factual learning (Table-II item 25). There is a need to re-visit the course to understand how we can achieve a balance between clinical and theoretical aspects of MNCH course.

Students identified that a more suitable time table is required (Table-II item 12) while

Table-III: Verbatim comments of faculty/LHV regarding themes and major trends and Frequency of trends under each theme.

Themes/Trends Frequency of trends: Faculty(Number)/LHV (Number)		
Theme 1: Challenges		
Trend 1: Time-shortage Response frequency: Faculty(70)/LHV(14)		
	Faculty	LHV
1	We don't have enough time to assess students and give detailed feedback.	increase students' timings when patients start coming, it's time for students to leave
Trend 2: Space-shortage Response frequency: Faculty(7)/LHV(0)		
2	Rooms are very small lack of privacy Students' learning is compromised	
Trend 3: Male-student refusal Response frequency: Faculty(14)/LHV(1)		
3	Object to males sitting in same room as patient refuse to give history to males	During family planning/breast feeding counseling, males sit outside patient objection.
Trend 4: Concurrent clinical and teaching demands Response frequency: Faculty (4), LHV (0)		
4	Teaching consumes extra five minutes on every patient	
Trend 5: City law /order problem Response frequency: Faculty(1), LHV(0)		
5	every other day, due to city-crises students can't come continuity in learning is disrupted	
Theme 2: Student-learning facilitation		
Student-learning experience Response frequency: Faculty (25), LHV(6)		
6	Excellent patient-turnover committed faculty good obstetric cases infertility cases meet most objectives through clinics and group-discussions	Students observe patients with breast-feeding problems, do breast-feeding counseling observe vaccinations, family planning counse-ling, antenatal care
7		prepare and paste illustrative posters in Urdu, conduct monthly health education sessions patients' positive feedback and appreciation
Theme 3: Way-forward Response frequency: Faculty (8), LHV(1)		
8	Increase timings for proper orientation, facilitation, and assessment	Send students at time of good patient-flow
9	A dedicated facilitator should accompany students for supervision and continuity of learning	

facilitators opined that students need to spend more time at the centers (Table-III comments 1,8). Part of the day is spent in travelling to and from the centers and this is wastage of precious learning time for students[15]. Another challenge expressed by facilitators was frequent "disruptions" due to law and order situation within the city. (Table-III, comment 5). Student safety has been stressed as an essential criterion for success of CBME[20]. Timetable gets overloaded when cancelled sessions have to be rescheduled and accommodated in shorter time span[16,20] resulting in its low score on DREEM questionnaire.

Our students expressed need for support system when they get stressed (Table-II, item 3). This problem has been identified in most Medical Education studies[21,22]. Causes of stress include limited time for leisure, exam stress, academic pressure, sleep deprivation, stressful personal life events and financial reasons[22]. Whether stress perceived by students in this rotation is due to general factors or is specifically related to this clerkship, needs investigation.

Our results show students had a sense of boredom during the rotation (Table-II, item 14). This could be because students' visits to the centers do not coincide with time of maximum patient flow. (Table-III comments 1,8). Also, as students are used to working in faster paced tertiary hospital with large influx of high risk patients, they may perceive community encounters to be less worthy leading to boredom[23]. Facilitators expressed need for having dedicated tutors for students (Table-III, comment 4,9). Shortage of dedicated tutors has been noted to be an important factor in community clinics[14]. Our teachers are prepared for hospital-based teaching but there is a need for teachers trained for community teaching. Available space for consulting patients and conducting clinics is restricted in community settings which is challenging for ensuring student learning (Table-IV, comment 2) There is evidence to show that dedicated and experienced faculty can teach efficiently in community settings with shorter teaching consultations[24].

As far as gender is concerned, there were no significant differences in DREEM subscales scores in our context[19,21] as seen in appendix 2. An important trend that emerged through the FGD was the refusal for history and examination of female patients by male students in the Obstetrics/Gynecology clinics. (Table-III comment 3). This contextual problem has also been seen in a study by McLean et al[25].

This study is highlighting need to take students to an integrated health system, with facilitators who are trained in teaching medical students in primary health care settings and review of course to make it less theoretical and more practical. Improving law and order situation is beyond the scope of the institution.

Further research is required to address stress amongst students and to create opportunities for better support. There is need to develop simulated environments for teaching examination skills for male students. Role of Nursing as facilitators of medical students is relatively less explored area in our settings. There is need to further develop and incorporate nurses into teaching.

Strength

It is one of the few studies in Pakistan that has evaluated learning environment of a community clerkship. This study will add to existing research on learning environment. The encouraging results and details may motivate other institutions to arrange medical students' clerkships in primary healthcare units, which may positively impact health indicators in general.

CONCLUSION

MNCH clerkship is a community clerkship, in a low/middle income country, in early years of its inception. DREEM questionnaire and FGD have highlighted areas for further improvement of the educational environment in this clerkship and is a step forward to strengthen it for better

maternal, neonatal and child outcomes in terms of their health.

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LIMITATION OF STUDY

Study was carried out in only one private Medical University of Karachi.

Disclosure

A pilot report of this study was presented orally and as poster presentation at the AEME conference in Islamabad on 7th and 8th March 2015.

CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

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