EVALUATION OF PERCEPTIONS OF UNDERGRADUATE MEDICAL STUDENTS ABOUT LEARNING ENVIRONMENT AT ALLAMA IQBAL MEDICAL COLLEGE LAHORE, PAKISTAN

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ABSTRACT

Background and Objectives: To evaluate perceptions of medical undergraduates of Allama Iqbal Medical College Lahore (AIMC) regarding its learning environment.

Methodology: Cross-sectional comparative study was done in Allama Iqbal Medical College Lahore, May to December, 2017. All medical students of five years who were attending classes during data collection on specific days were included after approval from ethical review board of the institution. A universal validated Dundee Ready Education Environment Measure (DREEM) inventory built on Likert scale was filled by the students anonymously after taking verbal consent from them. The data was analyzed using SPSS-19 software. Mean and ± SD for the five domains and overall score of DREEM inventory were calculated. Student t-test was used for statistical analysis for gender differences and basic/ clinical side.

Results: The DREEM questionnaire was filled by 1240 (76.4%) out of 1622 students. The overall mean score of DREEM was 106.58 ± 21.87 and 764 (61.61%) considered it more positive than negative. There was statistically significant association regarding the overall DREEM score between the preclinical and clinical students (p-value = 0.000). The notable points were that their teachers are knowledgeable, confidence in passing professional examination and they having good friends in college.

Conclusion: Our study concluded that the perception of medical undergraduates regarding their overall educational environment as positive. The students has positive perceptions regarding all five subscales of DREEM and lowest mean score was in the subscale of social perceptions.

Keywords: Academic, Atmosphere, Dundee Ready Education Environment Measure (DREEM), Educational Environment Medical students, Perceptions Learning, Social self-perception.

INTRODUCTION

The achievement and educational gratification of medical students is highly dependent upon their learning environment.[1] Therefore, evaluation of educational environment has been recognized as a strategic tool for the delivery of high quality education.[2] Managing curriculum successfully is only possible when assessments and systematic feedback are given.[3] The DREEM inventory is specific to the unique environment in medical education system. The DREEM inventory is a universal and a validated tool that provides medical teachers with a diagnostic aid in evaluating learning environment of their educational institute's.[4] A study conducted in Dow University of Health Sciences, Karachi, having three undergraduate medical colleges. The total DREEM mean score was 114.4/200 (57.2%). Highest score was noted in the domain of student's academic self-perceptions (58.7%) and lowest in domain of student's perception of learning (53.7%). There was significant difference of total DREEM score, student's perception of learning, teachers, and atmosphere between different colleges.[5] Another comparison study was conducted between Sheikh Zayed Medical College (SZMC), Rahim Yar Khan and Services Institute of Medical Science (SIMS) Medical, Lahore by using DREEM Questionnaire. An overall DREEM score was 90.4 in the remote area college, as compared with 113 in the metropolitan city college. Four out of the five subscales of DREEM showed a significant difference between the two medical colleges.[6] Currently the learning environment evaluation in Pakistan is, however, is under-researched and only a few researches have been conducted up till now with a small sample size and are limited to few institutions in one province.[7] A DREEM study was also conducted at five dental institutes of Pakistan with the sample size of only 197 students.[8] This study aims to evaluate the perceptions of the undergraduate medical students regarding the learning environment of Allama Iqbal Medical College by using DREEM Questionnaire.

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SUBJECTS AND METHODS

We conducted a comparative study at AIMC, Lahore from May to December 2017 after approval from the ethical review board. All the students from first to final year were included in the study who were present at the time of data collection after taking verbal consent from them. The data was collected on DREEM questionnaire which consists of 50 items that are measured on a five point Likert's scale (0-Strongly disagree, 1-Disagree; 2-Uncertain; 3-Agree; 4-Strongly Agree ;) It consisted of five domains consisting of students' perceptions of learning, perceptions regarding teachers, academic self-perceptions, perceptions about atmosphere and social self-perceptions with a maximum score of 200.The 9 of the 50 items in DREEM (4, 8, 9, 17, 25, 35, 39, 48 and 50) were the negative statements and scored in a reverse manner. The real positive points in items were those having a mean score of 3.5 or more. A mean of 2 or less indicated in any item in the inventory indicates a problem area. A mean score between 2 and 3 in an item were aspects of the environment that could be improved. The data was entered and analyzed in SPSS Ver: 20.0. Descriptive statistics were presented as mean and ± SD of DREEM inventory and its five subscales along with individual item mean scores for 50 items. Independent t-test was used to evaluate statistical significance between the subscales of inventory among gender, pre-clinical and clinical students with p-value < 0.05 as statistical significant.

RESULTS

Out of 1622 students, 1240 (76.4%) respondents filled the questionnaire with mean age of20.7 ± 2.46 years and 791 (64%) were females (Figure 1). The overall mean score of DREEM was 106.58 ± 21.87 and 764 (61.61%) considered that overall educational environment in college as more positive rather than negative. All the subscales were also on the positive side with

Fig-1 Frequency Distribution regarding gender of medical students
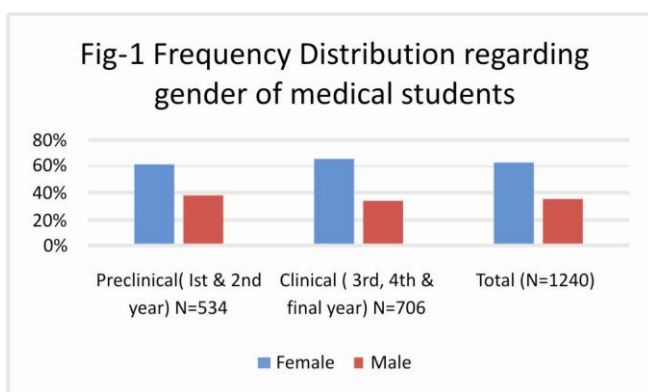
lowest score obtained by students' social self-perceptions (Table 1). Views regarding the educational environment from first year to final year students varies. Out of 241 final year students, 159 (65.9%) gave the hi-

ghest score to the global educational environment (EE) whereas 97 (40.75%) out 238 students of 2nd year reported plenty of problems. Regarding SPL, 100 (46.7%) out of 214 respondents of 4th year viewed teaching negatively (Table 2). The items 25 and 48 had mean less than 2 by all the medical students thus indicating problem areas (Table 2). However item No. 2 had mean score ranging from 2.92 to 3.22 by all the medical students regarding teachers' knowledge (Table 3). Among final year students 152 (63.07%) and 153 (61%) of 3rd year students had positive feeling about academic self-perceptions (Table 2). All the components of SASP subscale had mean value more than 2 except item No. 27 by final year students (Table 3) highlighting problem area. Out of 1240 students 635 (51.20%) had a more positive attitude regarding SPA. Whereas 153 (51.68%) out of 296 Ist year students thought that there were many issues regarding atmosphere of the campus which need improvement (Table 2). Item No. 17 related to cheating problem had scored mean less than 2 by third, fourth and final medical students indicating problem area. Similarly all the medical students from 1st to final year had mean score less than 2 for item No. 49 (Table 3). Out of 1240 medical students, 695 (56.04%) had considered SSSP under the category of not too bad. Item Nos. 3, 4 and 14 reported poor support system for stressed students (Table 3). There is statistically significant association between overall DREEM scores among the preclinical and clinical students (t-value = -4.443, *p-value* = 0.000) but there is no statistically significant association regarding males and females in relation to the overall score (t-test = -1.102 and p-value = 0.271) (Table 4).

DISCUSSION

The overall mean score of DREEM questionnaire was 106.58 ± 21.87 out of 200 in this study which is more towards lower range of moving towards positive side rather than highest side of the score thus indicating wide margin of improvement in educational environment. The global mean score ranges from 105-136 in various studies.[9-12] Institutions working with student-centred, integrated and problem based curricula obtained higher scores as compared to those dealing with conventional curricula.[13] Thus this institution's educational environment is towards the lower range of the positive side of the score due to teacher-centred and was factual learning atmosphere. To improve the overall score further student-centred and problem-based curricula needs to be adopted. There was statistically significant association regarding the overall DREEM score between the preclinical and clinical students *(p-value* = 0.000) which is confirmed by another study having *p-value* = 0.05[7] but no statistically significant association for ma-le and female students. This is contrary to another study regarding overall educational environment with high means among females as com-

Table 1: *DREEM Score by all the medical students of Allama Iqbal Medical College, Lahore (N = 1240).*

Domain	Maximum Score	Mean ± SD	Frequency of Maximum Score	Interpretation
Overall score of items	200	106.58 ± 21.87	764 (61.61%)	More positive educational environment
Students perception of learning (SPL)	48	24.83 ± 7.26	632 (50.96%)	A more positive perception
Students perception of teachers (SPT)	44	22.27 ± 5.14	608 (49.03%)	Moving in the right direction
Students' academic self-perception (SASP)	32	19.57 ± 5.17	741 (59.75%)	Feeling more on the positive side
Students perception of atmosphere (SPA)	48	24.68 ± 7.14	635 (51.20%)	A more positive attitude
Students social self-perception (SSSP)	28	15.24 ± 4.11	695 (56.04%)	Not too bad

Table 2: *Comparison of educational environment of first year to final year medical students.*

Domain	Ist Year Pre-clinical) (N = 296)	2nd Year (Pre-clinical) (N = 238)	3rd Year (Clinical) (N = 251)	4th Year (Clinical) (N = 214)	Final Year (Clinical) (N = 241)
0-50 (Very poor)	03 (01%)	04 (1.68%)	02 (0.8%)	03 (1.40%)	1 (0.41%)
51-100 (Plenty of problems)	109 (36.8%)	97 (40.75%)	79 (31.5%)	65 (30.37%)	78 (32.36%)
101-150 (More positive than negative)	177 (59.8%)	133 (55.88%)	162 (64.5%)	141 (65.88%)	159 (65.9%)
151-200 (Excellent)	07 (2.4%)	04 (1.68%)	08 (3.2%)	05 (2.33%)	3 (1.24%)
Students perception of learning (SPL)					
Mean ± S.D	24.56 ± 7.32	25.48 ± 7.34	25.58 ± 7.12	23.51 ± 6.82	24.91 ± 7.47
0-12 Very Poor	17 (5.74%)	12 (5.04%)	10 (4.0%)	13 (6.07%)	09 (3.7%)
13-24: Teaching is viewed negatively	122 (41.21%)	92 (38.65%)	91 (36.2%)	100 (46.7%)	95 (39.4%)
25-36: A more positive perception	148 (50%)	120 (50.42%)	136 (55.2%)	98 (45.7%)	130 (53.9%)
37-48: Teaching highly thought of	09 (3.04%)	14 (5.88%)	14 (5.6%)	03 (1.40%)	07 (2.90%)
Students perceptions of teachers (SPT)					
Mean ± S.D	20.19 ± 4.93	20.87 ± 4.69	23.03 ± 4.66	23.72 ± 5.04	24.06 ± 5.16
0-11:Abysmal	17 (5.7)	08 (3.36%)	04 (1.6%)	3 (1.40%)	02 (0.8%)
12-22: In need of some training	186 (62.8%)	146 (61.34%)	100 (39.8%)	70 (32.7%)	79 (32.7%)
23-33 Moving in the right direction	92 (31.08%)	83 (34.87%)	144 (57.4%)	135 (63.08%)	154 (63.9%)
34-44 Model teachers	1 (0.337%)	01 (0.42%)	03 (1.2%)	6 (2.80%)	06 (2.48%)
Students' academic self-perception (SASP)					
Mean ± S.D.	19.36 ± 5.30	19.69 ± 5.36	19.58 ± 5.10	20.22 ± 5.22	19.08 ± 4.81

0-8: Feeling of total failure	07 (2.36%)	10 (4.20%)	5(02%)	5(2.33%)	06 (2.48%)
9-16: Many negative aspects	78 (26.3%)	45(18.90%	55(21.9%)	42(19.6%)	57 (23.65%)
17-24: Feeling more on the positive side	165 (55.8%)	144 (60.50%)	153 (61%)	127 (59.3%)	152 (63.07%)
25-32: Confident	46 (15.5%)	39 (16.38%)	38 (15.1%)	40 (18.69%)	06 (2.48%)
Students perception of atmosphere (SPA)					
Mean ± S.D	22.78 ± 6.91	24.35 ± 6.49	23.03 ± 4.66	25.53 ± 7.59	25.24 ± 7.02
A terrible environment: 0-12	19 (5.1%)	09 (3.78%)	08 (3.2%)	12 (5.60%)	13 (5.39%)
Many issues need changing:13-24	153 (51.68%)	103 (43.27%)	90 (35.8%)	69 (32.54%)	86 (35.68%)
A more positive attitude:25-36	120 (40.5 %)	120 (50.42%)	136 (54.2%)	121 (56.54%)	138 (57.26%)
A good feeling overall:37-48	4 (1.4%)	06 (2.52%)	17 (6.8%)	12 (5.60%)	4 (1.65%)
Students social self-perceptions (SSSP)					
Mean ± S.D=	14.57 ± 4.15	15.47 ± 3.97	15.22 ± 3.98	16.07 ± 4.27	15.09 ± 4.08
Miserable: 0-7	15 (5.1%)	04 (1.68%)	07(2.8%)	7 (3.27%)	08 (3.31%)
Not a nice place:8-14	111 (37.5%)	91 (38.23%)	90 (35.8%)	61 (28.50%)	84 (34.85%)
Not too bad: 15-21	161 (54.4%)	125 (52.52%)	142 (56.6%)	130 (60.74%)	137 (56.8%)
Very good socially:22-28	09 (3.04)%	18 (7.56%)	12 (4.8%)	16 (7.47%)	12 (4.97%)

Table 3: *Individual scores of five subscales of all medical students (N = 1240).*

I. Student's Perceptions of Learning	First Year	Second Year	Third Year	Fourth Year	Final Year
1. I am encouraged to participate in class	2.11	2.26	2.27	**2.00**	2.16
7. The teaching is often stimulating	2.02	2.14	2.10	**1.76**	2.06
13. The teaching is student centered	*1.95*	2.15	2.06	**1.85**	**1.96**
16. The teaching helps to develop my competence	2.05	2.10	2.13	**1.98**	2.17
20. The teaching is well-focused	2.36	2.31	2.32	2.06	2.16
22. The teaching helps to develop my confidence	**1.74**	**1.95**	**1.99**	**1.81**	2.13
24. The teaching time is put to good use	2.34	2.25	2.34	2.07	2.15
25. The teaching over-emphasizes factual learning	**1.74**	**1.67**	**1.62**	**1.76**	**1.75**
38. I am clear about the learning objectives of the course.	2.04	2.19	2.42	2.29	2.23
44.The teaching encourages me to be an active learner	2.25	2.52	2.12	**2.00**	2.18
47. Long term learning is emphasized over short term learning.	2.27	2.42	2.60	2.38	2.36
48. Teaching is too teacher-centred.	**1.68**	**1.62**	**1.60**	**1.56**	**1.61**
II. Students' Perceptions of Teachers	First year	Second year	Third year	Fourth year	Final year
2. The teachers are knowledgeable	3.22	2.99	2.92	3.13	3.11
6. The teachers are patient with patients	--	--	2.43	2.55	2.47
8. The teachers ridicule the students	**1.64**	**1.86**	2.01	**1.89**	**1.95**

	First year	Second year	Third year	Fourth year	Final year
9. The teachers are authoritarian	**1.13**	**1.37**	**1.33**	**1.33**	**1.35**
18. The teachers have communication skills with patients	2.46	2.33	2.59	2.77	2.84
29. The teachers are good at providing feedback to the students	2.09	2.19	2.24	2.13	2.13
32. The teachers provide constructive criticism here	**1.91**	**1.97**	2.12	2.01	**1.94**
37. The teachers give clear examples	2.46	2.45	2.50	2.52	2.81
39. The teachers get angry in class	**1.13**	**1.65**	**1.34**	**1.37**	**1.50**
40. The teachers are well-prepared for their classes	3.04	2.64	2.69	2.80	2.73
50. The students irritate the teacher	**1.11**	**1.43**	**0.87**	**1.22**	**1.42**
III. Students' Academic Self Perceptions	*First year*	*Second year*	*Third year*	*Fourth year*	*Final year*
5. Learning strategies which worked for me before continue to work for me now.	2.06	2.17	2.29	2.47	2.41
10. I am confident about passing this year	3.31	3.05	2.95	3.02	2.85
21. I feel I am well prepared for my profession	2.46	2.39	2.36	2.30	2.11
26. Last year's work has been a good preparation for this year's work	2.29	2.52	2.36	2.40	2.35
27. I am able to memorise all I need	2.09	2.12	2.07	2.19	**1.96**
31. I have learned a lot about empathy in my Profession	2.48	2.48	2.63	2.79	2.59
41. My problem solving skills are being well developed here	2.20	2.26	2.37	2.45	2.26
45. Much of what I have to learn seems relevant to a career in health care	2.47	2.63	2.55	2.60	2.56
IV. Students' Perceptions of Atmosphere	*First year*	*Second year*	*Third year*	*Fourth year*	*Final year*
11. The atmosphere is relaxed during the ward teaching	--	--	**1.96**	**1.79**	**1.94**
12. The college is well timetabled	2.56	2.54	2.62	2.27	**1.98**
17. Cheating is a problem in this school	2.06	2.07	**1.86**	**1.70**	**1.63**
23. The atmosphere is relaxed during lectures	**1.59**	2.02	2.14	2.11	2.31
30. There are opportunities for me to develop interpersonal skills	2.22	2.36	2.24	2.29	2.32
33. I feel comfortable in class socially	2.41	2.66	2.54	2.57	2.56
34. The atmosphere is relaxed during seminars/tutorials	2.16	2.33	2.33	2.36	2.34
35. I find the experience disappointing	2.12	2.07	2.00	2.12	2.00
36. I am able to concentrate well	2.05	2.11	2.11	2.16	2.00
42. The enjoyment outweighs the stress of the course	**1.77**	2.16	2.25	2.07	2.13
43. The atmosphere motivates me as a learner	2.08	2.14	2.08	2.12	2.07
49. I feel able to ask the questions I want	**1.76**	**1.89**	**1.83**	**1.98**	**1.96**
V. Students' Social Self Perception	*First year*	*Second year*	*Third year*	*Fourth year*	*Final year*
3. There is a good support system for students who get stressed	**1.20**	**1.31**	**1.50**	**1.41**	**1.35**
4. I am too tired to enjoy the course	**1.29**	**1.49**	**1.56**	**1.62**	**1.51**

14. I am rarely bored on this course	**1.83**	**1.87**	**1.96**	**1.93**	**1.76**
15. I have good friends in this college	3.02	3.02	2.90	3.12	2.90
19. My social life is good	2.75	2.89	2.75	2.99	2.77
28. I seldom feel lonely	2.35	2.45	2.24	2.42	2.39
46. My accommodation is pleasant	2.13	2.27	2.30	2.58	2.42

*Bold values indicate problem areas

pared to males with *p-value* = 0.002.[5] This gender-based difference as reported in medical students of Srilankal medical college which may be due to better interpersonal skills among females compared to males.[14]

All the five subscales of the DREEM questionnaire had positive perceptions in this study which are consistent with another study conducted among first-year medical students of a medical university of Malaysia.[15] However negative perceptions for all subscales were reported by Sheikh Zayed Medical College, Rahim Yar Khan in Punjab.[6] SPL had the overall highest mean score and lowest mean was obtained by SSSP whereas another study reported highest mean by SPA which is contrary to our study but lowest mean score of SSSP and this finding is comparable to our study. Thus more importance needs to be given to subscale 5 and good support system is required for the students to relieve their stress and make the course enjoyable for them by the college administration.

Regarding SPL, 40.3% of medical students perceived teaching negatively. The reason for negative perception among medical students of Spain was traditional curriculum and traditional methods of teaching[16] which also still prevails in most of the medical colleges of Pakistan. Items 25 and 48 scored less than 2 by all the medical students of different classes which are comparable to other studies regarding factual learning and teacher-centred teaching.[17-19] Formative and summative assessments are the probable factors that drive factual learning and a problem based evaluation of students might be the key factor for doing away with both teacher-centered and factual learning.[20] It is always best for teachers to use a combination of these approaches to make sure that all the learning needs of student are met.[21]

Approximately 46.8% students were of the view that teachers were not well trained specially by basic

Table 4: *Preclinical/clinical and gender differences for DREEM questionnaire.*

Domain	Preclinical	Clinical	t-value	P-value
Scale 1 (POL)	24.97 ± 7.34	24.73 ± 7.19	-0.586	0.558
Scale 2 (POT)	20.50 ± 4.83	23.60 ± 4.96	-11.037	0.000
Scale 3(ASP)	19.51 ± 5.33	19.61 ± 5.05	-0.325	0.745
Scale4 (POA)	23.48 ± 6.77	25.59 ± 7.29	-5.194	0.000
Scale 5(SSP)	14.97 ± 4.09	15.43 ± 4.12	-1.964	0.050
Overall score	103.43 ± 21.64	108.97 ± 21.75	-4.443	0.000
Domain	Females	Males	t-value	P-value
Scale 1(POL)	24.76 ± 7.06	24.96 ± 7.59	-0.480	0.632
Scale 2 (POT)	22.45 ± 5.04	21.94 ± 5.30	1.69	0.090
Scale 3(ASP)	19.21 ± 5.09	20.20 ± 5.26	-3.25	0.001
Scale4 (POA)	24.59 ± 7.18	24.84 ± 7.08	-0.589	0.556
Scale 5(SSP)	15.06 ± 4.17	15.55 ± 4.00	-2.031	0.042
Overall score	106.06 ± 21.64	107.49 ± 22.26	-1.102	0.271

science students of this college. This raises a serious concern as it indicates that pre-service and in-service training of the teachers should be mandatory to strengthen their capacity building and attitudes. Item 2 attained approximately a mean score of 3 by all the medical students which indicate that this item can further be enhanced but contrary to this, this item scored 3.50 by Malaysian medical students indicating that teachers excels in this institution.[17] However items 8, 9, 39 and 50 scored equal to or less than 2 by all the medical students and these need to be addressed to make the students satisfied with the attitude of the teachers. However for item 9 the pre-clinical students thought that teachers are not authoritarian except by the clinical students.[22] In a study conducted in India, students' perceptions of teachers moved towards the right direction but similar to this study, students reported that their teachers got angry and were authoritarian[12] which is confirmed by other studies.[9,18] This warrants to enhance training of teachers to match the

varying demands of medical students and a shift from a traditional approach to innovative teaching methodlogy where teachers play a pivotal role as a facilitator.[13]

The mean value of item 27 of SSAP which indicates that there are problems for the students for memorizing the subjects which could be due to study overload on the students. Undoubtedly, there is a need to revise curriculum not only in terms of methodology but also by a thoughtful reconsideration to the contents of course. For item 10 the mean score of Ist, 2nd and 4th year students was more than 3. The reason for this could be regular conduction of tests and terms tests in this institution making them confident for passing the annual examination.

About 51.20% students had a positive attitude for SPA except Ist year students where 51.68% students were of the view that there are many issues which require alterations. The reason for this may be that they were in the phase of adjustment with the professional environment which they have joined about six months back. SPA is very important, because it influences all aspects of teaching and learning. The clinical undergraduates perceived that cheating is a main problem contrary to the basic science students. Cheating among medical students may have very grievous and longterm consequences for future doctors. Medical institutions should develop an environment that promotes integrity and honesty.[23] However regarding perception of educational atmosphere, it seems to be related to deficiencies in infrastructure of institutions. Class rooms that are noisy and with uncomfortable seating arrangements, overheated or too cold rooms etc. make it challenging for the medical students to concentrate or study in relax atmosphere.[24] Lowest score for SPA also reported from another study depicting a specific importance to a favorable physical environment to facilitate the learning process.[25] About 56.04% students perceived SSSP as "not too bad". Items 3, 4 and 14 of SSSP scored less than two reflecting that there are many problems which need to be catered. Thus more importance may be given to proper counseling of the students and trained counselors are to be provided in the college to help students to cope with the academic and non-academic stresses. Peer counseling is also very important and well-stabled students of all the years are to be trained for this purpose.[26]

It is **concluded** that more than 60% students considered overall educational environment more positive than negative. Final year students gave the highest score with the lowest score given by 2nd year students. All the students gave lowest score to their perceptions of teachers and perceptions for learning, and highest score to their self-academic perceptions.

RECOMMENDATIONS
Regular feedback from the students for learning environment is essential for improving the quality and standard of medical education.

Authors' Contribution
SH: Contributes to the conception, design, execution and analysis and final interpretation of data. Supervised all the activities of the study. Participated in drafting and revising the manuscript critically. Finally approved the manuscript and also accountable for all aspects of the manuscript. NP: Assisted in the design and execution of the study along with the data collection, data entry, analysis and interpretation of results. Also helps in writing of the manuscript. SZUH: Helps in collecting the data, its entry, analysis and interpretation of data Also helps in writing the discussion part of the manuscript. MA: Assisted in data collection, its entry, analysis and interpretation of data. Also assisted in writing the final results for the manuscript. MWR: Helps in data collection, its entry, and analysis of data. Helps in final compilation of the data.

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Conflict of Interest
None.

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