

## TRAINEES' PERCEPTION OF LEARNING ENVIRONMENT IN PUBLIC TEACHING HOSPITALS OF RAWALPINDI: A MIXED METHODS STUDY

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### ABSTRACT

**Objectives:** To evaluate the perception of postgraduate trainees about their Postgraduate hospitals educational environment in 3 public teaching hospitals, analysis of their problems and to suggest solutions.

**Study Design:** Mixed-methods sequential.

**Place and Duration of Study:** Rawalpindi Medical University Allied Hospital, from Jun 2015 to Mar 2017.

**Patients and Methods:** In first stage, 221 PGTs selected by non-probability convenient sampling, filled postgraduate hospital educational environment measure. During second stage, 4 semi structured focus group discussions were conducted.

**Results:** Overall mean score 78.27 indicated plenty of problems. PGTs admired some positive aspects but their postgraduate hospital educational environment was compromised due to inadequate basic facilities, suboptimum administration, uncooperative paramedical staff, patients & attendants, misconceptions of public about their duties & thus holding them responsible for every problem in hospital, media's propaganda, unrealistic expectations of seniors, lack of senior commitment, patient overload and prolonged working hours. PGTs suggested that administration should take responsibility to provide, adequate basic facilities, security and restriction on weapons. There should be predefined fixed duty hours, appropriate Job descriptions and monitored system of entry for attendants. Health budget must be increased, appropriately allocated and fairly utilised. Adequate seats of paramedics, PGTs and consultants must be ensured. Government and media should provide realistic information about hospital facilities to optimize patient's expectations. Seniors should facilitate theoretical and practical learning by personal involvement in a friendly environment and should discuss PGTs problems on regular bases.

**Conclusion:** PGTs in PTHs perceive plenty of problems during training which should be solved to improve working conditions and patient care.

**Keywords:** PHEEM, Postgraduate training, Public teaching hospitals.

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### INTRODUCTION

Educational environment, referred to as climate, atmosphere or tone, is a set of factors that describes what it is like to be a learner within that organization<sup>1</sup>. According to adult learning theories, teaching is as much about setting the context or climate for learning as it is about imparting knowledge or sharing experience<sup>2</sup>. As part of assessment of various educational programs, educational environments of many medical institutions have been extensively studied world over<sup>3-9</sup>. These studies help to plan measures for improvement of

educational environment and enhance learning<sup>3-9</sup>. Public teaching hospitals (PTHs) provide an excellent opportunity for postgraduate training due to variety of complex clinical cases and structured training programs under senior supervision. Good learning environment must be ensured in these hospitals to optimize patient care as psychosocial work environment of doctors effects the quality of treatment they deliver to the patients<sup>10</sup>. A supportive environment in which doctors are nurtured, respected and involved will ensure a better patient care<sup>10,11</sup>. In Pakistan both under graduate and post graduate medical educational environments have been evaluated in recent past<sup>12-22</sup>. Most of these studies reveal dissatisfaction among young doctors regarding their professional carrier and

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training<sup>12,20,22</sup>. Their discontentment is also evident from brain drain, significant incidence of anxiety/depression and frequent strikes<sup>23-25</sup>. These studies of post graduate hospital educational environment {PGHEE} in different institutions of Pakistan have several methodological shortcomings such as lack of confidentiality and anonymity in data collection, use of a single research design i.e., qualitative or quantitative, assessment of a single or few aspects of training or selection of PGTs from a single hospital /department which raises questions about authenticity/representativeness of data<sup>17-22</sup>. Extensive evaluations of PGHEE should be done throughout country to analyze the situation and develop evidence based strategies for creating optimal learning environment. In order to ensure accuracy and representativeness of data, a multidimensional assessment should utilize mixed method approach, imply appropriate techniques to ensure confidentiality & anonymity during data collection and include adequate sample size representing PGTs serving in various specialties of PTHs of the study site. Aim of this study was to evaluate the perception of the PGTs about their PGHEE in 3 PTHs and in-depth exploration of their perceived problems and suggested solution.

## **MATERIAL AND METHODS**

This two stage mixed-method sequential study was conducted in three PTHs affiliated with Rawalpindi medical university (RMU) i.e., Holy Family Hospital (HFH), Benazir Bhutto Hospital (BBH) and District Head Quarters Hospital (DHQ), from June 2015 to March, 2017. These institutions with 500 PGTs serving a wide variety of clinical cases on almost 2162 beds in diverse specialties, under supervision of almost 85 consultants, provided an excellent opportunity for this study.

After approval from institutional review board of RMU, heads of various units of gynaecology, surgery, medicine, pediatrics, orthopedics, urology, neurosurgery, anesthesia and psychiatry were contacted for permission to

collect data at most convenient time by appointment. Total 270 PGTs of FCPS were approached. Out of these, 257 willing PGTs were included by non-probability convenient sampling after informed written consent. The context and process of filling the survey questionnaire post-graduate hospital educational environment measure (PHEEM), was explained to PGTs in their free time and calm environment. Confidentiality and anonymity was ensured by directly handing over questionnaire to each participant, requesting not to mention name and collecting back in sealed ballot box on the spot. PHEEM is a sensitive, reliable, valid, multi-dimensional quantitative instrument commonly used for measuring the quality of medical residency programs<sup>5-9,16,18,20,21,26</sup>. It's 40 statements are ranked by using 5 point Likert scale. Total PHEEM score (0-160) gives an overall assessment of educational environment: a score of 0-40 indicates "very poor", 41-80 indicates "plenty of problems", 81-120 indicates "room for improvement" and 121-160 indicates "an excellent" educational environment. The PHEEM instrument is further divided into 3 subscales: perception of role autonomy, perception of teaching and perception of social support. For adaptation to local social and clinical settings, PHEEM was reviewed by 2 PGTs, 2 consultants, 1 medical educationist & 1 research associate. According to their suggestions, In item # 7 "racism" was replaced by "discrimination/ favoritism ", in item #11 "paged inappropriately" was replaced by "placed on duty roster inappropriately" and in item # 17 "AMA HMO certified agreement" was replaced by "pre-defined working hours". At end of questionnaire a space for free text responses was provided. The face validity and reliability of this edited version was checked by a pilot study. The obtained quantitative data was analyzed using SPSS version 21. Descriptive statistics (Overall Mean score, Mean score for subscales with S.D & S.E.M and frequencies) were calculated. ANOVA (Analysis of variance) was carried out for statistical difference between the mean scores of various groups.

Four focus group discussions (FGD) were conducted (2 in HFH, 1 in BBH, 1 in DHQ) for in-depth exploration of problems faced by PGTs and their suggested solutions. These semi-structured, audiotape FGDs were conducted by an experienced moderator who was previously not known to the participants. Confidentiality and anonymity was maintained by assigning study identities. Total 34 PGTs, male & female from different departments and training years were included to ensure maximal variation sampling technique. After briefing and consent,

Q1: Which problems do you face in your physical, emotional and intellectual learning environments?

Q2. What are the reasons of and solutions for these problems?

Probes were used to generate discussions such as authorities, budget, lack of awareness, poor polices, lack of SOPs, absence of sensitivity, low sense of responsibility. PGTs appreciated positive aspects of their PGHEE as well. Those were recorded and analyzed. FGDs were transcribed for thematic analysis. Author

**Table-I: Demographic features of participants.**

Variable	Categories	Frequency	Percentage (%)
Age groups	Less than 30 years	164	74.2
	Equal or more than 30 years	57	25.8
Sex	Male	81	36.7
	Female	140	63.3
Marital status	Married	121	54.8
	Unmarried	100	45.2
Hospital	HFH	95	43.0
	BBH	75	33.9
	DHQ	51	23.1
Specialties	Surgery and allied	79	35.7
	Medicine and allied	86	38.9
	Obs and Gynae	56	25.3
Working position	PGY1	85	38.5
	PGY2	50	22.6
	PGY3	44	19.9
	PGY4	42	19.0
Employee	Paid	164	74.2
	Honorary	57	25.8

participants filled PHEEM questionnaire to capture the first stage of study. FGDs were given a structure based on Chamber & Wall's description of educational environment. They described educational climate in three components. The physical environment: safety, food, shelter, comfort etc. The emotional climate: security, constructive feedback, being supported and absence of bullying and harassment; and the Intellectual climate: learning with patients, relevance to practice, evidence based active participation by learners, motivating and planned education<sup>1</sup>. Discussion was focused around the following questions:

critically reviewed transcribed data with feedback from participants to develop consensus about interpretation and their suggestions were incorporated. Relevant responses of each question were color coded to identify patterns and themes. Three exclusive themes were identified after repeatedly revisiting, which were categorized under predetermined chamber and WALL's (piori codes) description.

**RESULTS**

Our response rate was 95.18%. After exclusion of 36 incompletely filled forms, the final sample included 221 (86 %) participants. Table-I

contains their demographic features. Forty free text responses were included in qualitative data.

Overall PHEEM score of 78.27 indicated 48.9% satisfaction and plenty of problems in learning environment table-II. Score for role autonomy 27.98 (49.9% satisfaction) was inter-

participants was significantly better than females. Perception of first & second year PGTs was better than third & fourth year. There was no significant difference between perception of PGTs in three groups of specialties, paid/unpaid, married/unmarried. There was no significant difference in overall PHEEM score of three hospitals but the

**Table-II: Descriptive statistics (Overall Mean score, Mean score for each subscale with S.D & S.E.M and frequencies) ANOVA (Analysis of variance) to find out the statistical difference between the mean scores of various groups.**

Scores	Mean Score	Gender M (SD)		Specialty M (SD)			Hospital M (SD)		
		Male	Female	Surgery & Allied	Medicine & Allied	Obs & Gynae	HFH	BBH	DHQ
Total pheim score	77.30 ± 23.885	82.69 ± 23.577	74.18 ± 23.585	76.19 ± 23.799	78.22 ± 25.896	77.45 ± 20.958	74.37 ± 26.381	80.43 ± 23.077	78.16 ± 19.542
<i>p</i> -value		0.011		0.862			0.25		
Autonomy	27.38 ± 8.279	29.06 ± 7.889	26.41 ± 8.371	26.86 ± 8.575	27.35 ± 8.712	28.16 ± 7.183	26.29 ± 9.073	28.59 ± 7.932	27.63 ± 7.017
<i>p</i> -value		0.02		0.669			0.195		
SS	20.65 ± 8.035	22.60 ± 7.800	19.52 ± 7.979	21.00 ± 8.029	21.00 ± 8.233	19.63 ± 7.787	20.68 ± 9.104	21.55 ± 7.921	19.27 ± 5.682
<i>p</i> -value		0.006		0.544			0.298		
teaching	29.27 ± 9.513	31.02 ± 9.949	28.25 ± 9.134	28.33 ± 9.118	29.87 ± 10.730	29.66 ± 8.010	27.39 ± 9.712	30.29 ± 8.822	31.25 ± 9.662
<i>p</i> -value		0.036		0.548			0.033		

  

Scores	Mean Score	Employment satus (Mean ± SD)		Marital status (Mean ± SD)		Working position (Mean ± SD)			
		Paid	Unpaid	Married	Un-Married	1st year PG	2nd year PG	3rd year PG	4th year PG
Total pheim score	77.30 ± 23.885	77.92 ± 18.786	79.26 ± 17.033	77.04 ± 17.939	79.75 ± 18.756	82.59 ± 19.283	80.24 ± 18.030	71.18 ± 18.258	74.60 ± 13.786
<i>p</i> -value		0.635		0.275		0.03			
Autonomy	27.38 ± 8.279	27.91 ± 5.678	28.18 ± 5.369	27.79 ± 5.541	28.21 ± 5.666	29.16 ± 6.250	28.88 ± 4.992	26.05 ± 4.880	26.52 ± 4.769
<i>p</i> -value		0.757		0.575		0.004			
SS	20.65 ± 8.035	20.87 ± 5.642	21.46 ± 5.015	20.42 ± 5.481	21.75 ± 5.420	22.04 ± 5.362	20.94 ± 5.658	19.25 ± 5.422	20.93 ± 5.266
<i>p</i> -value		0.489		0.073		0.056			
Teaching	29.27 ± 9.513	29.14 ± 9.685	29.63 ± 9.072	28.83 ± 9.357	29.79 ± 9.720	31.39 ± 9.962	30.42 ± 9.806	25.89 ± 9.487	27.14 ± 6.716
<i>p</i> -value		0.738		0.459		0.005			

preted as a negative view of one's role. Score for teaching 29.27 (48.7% satisfaction) meant that there was need of some retraining. Score for social support 21.02 (47.7% satisfaction) depicted it was not a pleasure place. Perception of male

perception of teaching was better in DHQ hospital. Cronbach's Alpha for total PHEEM score was 0.935, while for role autonomy, teaching and social support it was 0.760, 0.816 and 0.852 respectively.

Regarding positive aspects of environment PGTs appreciated cameras installation "There are security cameras in Pediatrics and I feel much secure now" (P3-FGD 1-HFH) and efforts of their consultants "Our head of department himself makes sure that everyone is well catered in terms of food" (P3-FGD2-HFH). Their emotional satisfaction stemmed from appreciation and support of patients, seniors and their own families, "Many patients pray for us" (P1-FGD1-HFH), "Patient satisfaction is a big motivating factor that happens once in a while." (P5-FGD4-BBH), "The best thing about surgery unit is the head of department, his help and support keeps us all going 24 hours" (P5-FGD4-BBH), "Our family support is one thing which helps to keep us going in this environment" (P4-FGD3-DHQ). Hospitals were perceived as an excellent learning opportunity. "Academic excellence achieved by Monday to Friday teaching sessions and practical learning is enhanced by the variety of patients." (P2-FGD4-BBH) and "Our Head of department is overzealous, efficient, good mentor and teacher" (FTR-BBH-Form#44). Table-III shows thematic analyses of barriers (problems and causes) and recommendations/suggestions. Physical environment was compromised due to inadequate basic facilities and lack of security. "There is no safety, no infrastructure, no proper living space and no cooling system. Main things are missing (P1-FGD2-HFH) and "If patients bring weapons, no security is available to us, especially in psychiatry departments where we have to treat psychotic patients in a space where no one is present. In that situation if any patient confronts us, no one can rescue, even there are no scanners to detect weapons, not even outside the department" (P7-FGD4-BBH). Inadequate staff, equipment and medicines were big issue "Because of small number of staff available we have to do everything by ourselves, it becomes difficult for us to manage everything" (P1-FGD3-DHQ). "There is disparity between number of beds and patients and between number of patients and paramedical staff and doctors" (FTR-BBH-Form# 188). Emotional environment

was distressing due to strict seniors and unhelpful administration "When we take up our concerns with the seniors, they tend to side with the administration as they have come to accept these circumstances as the norm having faced and lived with them during their own training. At this stage, their priority seems to be maintaining good rapport with the administration" (P6-FGD1-HFH). "Seniors are rude, treat us as a tool, and never give us opportunities, lack professional sense, practice leg-pulling & favoritism. Due to this my family is affected badly. (FTR-HFH-Form# 126).

Uncooperative paramedical staff, patients and attendants were other sources of disturbance "In Gynae ward paramedic staff is not available most of the time for shifting patients, treatment and ultrasonography. Only doctors are held responsible for any mishap during labor (P5-FGD1-HFH) and "In Pediatrics, we frequently face rough behavior of attendants, at times they even try to abuse us physically, I am not blaming them, they are emotionally upset due to sick child and have high expectations. (P3-FGD 1-HFH). Public had misconceptions about their duties and held them responsible for every problem "We are held responsible for every type of problem in hospital and despite these circumstances and workload seniors do not give us credit. (P6-FGD2-HFH) and "Expectation of patients are very high they expect us to give them full protocol like private hospitals" (P6-FGD1-HFH).

Negative propaganda of media had further deteriorated the situation. "Most people judge us from television news. Every adverse event, which may happen one in thousands, is highlighted. People associate that incidence with all doctors. Media tarnishes our image by blaming us if we protest for our rights as doctors (P3-FGD 1-HFH). Although senior doctors themselves were not very committed but had unrealistic expectations from PGTs "All they expect from us is to work and work without infrastructure, electricity and proper beds to sleep. After all we are human beings as well and how can anybody expect this from us when we have to study a lot as well" (P2-

FGD 1-HFH). Intellectual Environment was compromised by patient overload and prolonged working hours “Due to large number of patients working hours” (P3-FGD4-BBH) and “Practical skills alone are not enough we must gain adequate theoretical knowledge and clear

**Table-III: Thematic analyses of focus group discussions.**

Areas	Barriers	Recommendations
Physical educational environment	Lack of basic facilities (safety, basic infrastructure, living space, heating/cooling system, clean drinkingwater, proper cafeteria)	Administration should take responsibility to provide basic facilities. Establish proper cafeterias with check on quality & rates. Doctors may also contribute e.g, water dispenser.
	Security issues: Inadequate number of guards. Untrained security guards, There is no scanner and no security even in department in case any psychotic patients or attendants confront doctors.	Administration should implement a system of check and balance on selection & performance of guards. Proper procedure for attendants should be defined and Identify those attendants who come along with weapons.
	There are long and hectic calls.	Duty hours should be fixed. Job descriptions should be well defined. Administration should clearly mention job responsibilities of every one.
	Disparity between number of patients and doctors. Even available Seats remain vacant as new doctors are not recruited timely. Inadequate no of paramedical staff and their absence from work station.	Number of permanent seats for doctors and paramedic staff should be Increased to match the number of patients. Increasing the health budget and ensure fair utilisation. Paramedical staff should be accountable just as doctors are accountable.
	Inadequate equipment & Instruments in department e.g, medicines, scan machine and beds.	There should be a referral system so that in case of lack of beds we can refer patients to closest tertiary care hospitals. Increase health budget and administration should allocate budget equally in every department A proper check and balance system should be introduced. There should be audits of funds.
Emotional educational environment	Behavior of attendants toward us is often rude because of lack of facilities. If they have to bring glucose or some medicines from outside they behave rudely.	Government should give realistic view to the patients. Senior doctors should properly guide the relevant patients that this hospital is not a heaven where everything is available.
	Discriminatory and harsh attitude of seniors such as, leg-pulling, favoritism, depriving us form opportunities, harassment, political pressure, use of insulting words, take out their frustration on us, don't listen our concerns, blame on us in case of expiry of any patient, unfriendly. Discrimination in duty hours of PGTs and other staff, PGTs have very long and hectic working hours.	A forum should be provided to us where we can discuss our problems as there is a discussion on problems of patients on daily basis. All these discussion and feedback should be conveyed to senior so that they will be able to realize our problems. If seniors create friendly environment we will be more comfortable and they should be aware of our problems.
	Trainees face very hectic routine, expected to work with out proper infra structure, for 30 hours at a stretch, when on call. It is psychologically distressing.	A protocol should be formulated by administration and distribution of work should be according to protocol.
	Administration does not pay attention to PGTs problems. If we go to administration to reports our problems, they do not listen and ask to report to our seniors.	Administration should develop proper infrastructure for junior to help them how can they convey their message to relevant person.
	Media portrays a negative image of doctors by highlighting minor issues and reporting things out of context. If we protest for our rights, everybody criticizes us.	Positive image of doctors should be conveyed to people through studies or TV channels. Media should respect our point of views.
	Due to lack of facilities attendants show rude behavior toward us and ask to arrange beds, blood, medicine. But it is not our duty or fault. If Attendants come inside, interrupt us during treatment and become hostile.	There should be a psychologist for counselling of patients. Policy should be implemented to control relatives influx on clinical floor. Awareness about diseases should be increased through media.
	Seniors do not grant us leaves.	A standard protocol should be made for at least two elective leaves.
Intellectual educational environment	Due to long hectic working hours remaining time is not sufficient for studies.	There should be fixed working hours.
	Trainees do not pass exams despite a lot of practical exposure because they do not have enough theoretical knowledge. We do not have regular classes for theoretical learning and protected teaching time for self study.	Both theoretical knowledge and supervised practical skills should be improved. Experienced seniors should guide for theoretical learning and exam preparation. Intermittent Internal exams should be conducted for better preparation of finals. Modular system should be introduced instead of exams after 2- 4 years.
	Our supervisors do not have not enough time as they are busy with their work and patients	Increase number of supervisors to match numbers of PGTs.
		PGs from different departments should present their work under supervision of seniors.

we can only achieve quantity but not quality” (P5-FGD1-HFH) and “We do not have time to seek theoretical knowledge because of long examinations” (P2-FGD3-DHQ). Lack of senior commitment also effected learning “Our supervisors are least concerned. They don't own

us and don't take responsibility to teach us" (P7-FGD3-DHQ). Cross cutting issue was gross disparity between hospital capacity (both in terms of physical facilities & human resource) and patient load. This disrupted physical, emotional and intellectual learning environments. Suggestions are summarized in table-III.

## DISCUSSION

Post-graduate training, involving transfer of both knowledge and skills in real time setting is a challenging task. In our low income country, where main objective of PTHs is to treat maximum number of patients using minimum resources, implementation of an organized, structured and standardized training program is not easy. Our PHEEM score 78.27, indicating plenty of problems, is comparable with 79.82, score of a study conducted in twin cities in 2014 but It is lower than 130.32, score of surgery departments at RMU & Allied hospitals and 93.96 score of a study in 3 hospitals of Karachi<sup>18-20</sup>. This difference may be due to non-confidential data collection technique, inclusion of a single specialty/a private institution in these studies. Our score is less than scores of economically sound countries e.g. Ireland (82.88), Saudi Arabia (98.21) and West Australia (117 in rural & 113 in urban setting). This is due to their better planning, higher health budget and greater awareness about significance of learning environment & rights of doctors. Institutional climate and social-familial influences have a profound impact on educational outcomes<sup>27</sup>. Social-contextual factors hampering training of our participants included insufficient basic facilities, no security, inadequate senior supervision, unsupportive paramedics and unfair administration. Biggs and associates<sup>19</sup> found inadequate number of supervisors, insufficient water supply, electricity breakdown and poor cleanliness in various hospitals of Pakistan. Poor working conditions, low salary, long working hours and lack of professional excellence have been documented as reasons for brain drain from Pakistan<sup>23</sup>. Long working hour and poor peer support are cause of stress for PGTs of Agha

Khan University<sup>24</sup>. Working conditions affecting both physician's well-being and quality of patient care in Germany include, work overload, workflow interruptions, ineffectual leadership, poor social support, time constraints, conflicting demands, limited control on work, lack of participation & suboptimal cooperation among staff<sup>10</sup>. Our participants experienced mental stress when seniors highlighted their mistakes negatively. Imran and assoc<sup>22</sup> also reported 51.6% bullying by consultants. Alarming incidence of anxiety & depression has been reported in doctors, 67% in CMH Lahore and 59.88 % in Agha Khan University<sup>24,25</sup>. In Australia psychological stress was significantly higher in doctors than the general community and was associated with: discontentment with workload, lack of job satisfaction, off time work and workplace bullying<sup>28</sup>. Our participants also expressed dissatisfaction due to misconceptions about their duties in general public and negative propaganda by the media. These problems are not reported by other studies.

## RECOMMENDATION

Recommendations (table-III) of this study suggest ways for improvement of PGHEE in PTHs of Pakistan. Similar evaluations in other post-graduate institutions of country would contribute towards general uplift of medical education and patient care.

## Strengths & Weaknesses

Strengths of our study are high response rate, inclusion of PGTs from several different specialties of 3 PTHs and mixed method approach. Assessment of first stage "plenty of problems" was confirmed by participant's perspective in FGDs, validating findings from both sources. Weakness of this study is that findings cannot be generalized throughout country as private, federal government and army post graduate medical institutions were not include.

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### CONFLICT OF INTEREST

This study has no conflict of interest to be declared by the author.

### REFERENCES

- Chambers R, Wall D. Teaching Made Easy: A Manual for Health Professionals. *BMJ* 2000; 320(7250): 1677.
- Hutchinson L. The ABC of learning and teaching: Educational Environment. *BMJ* 2003; 326(7393): 810-12.
- Kohli V, Dhaliwal U. Medical students' perception of the educational environment in a medical college in India: A cross-sectional study using the Dundee Ready Education Environment questionnaire. *J Edu Eval Health Prof* 2013; 10: 5.
- Vaughan B, Carter A, Macfarlane C, Morrison T. The DREEM, part 1: measurement of the educational environment in an osteopathy teaching program. *BMC Medical Education* 2014; 24(1): 99.
- Flaherty GT, Connolly R, O'Brien T. Measurement of the Postgraduate Educational Environment of Junior Doctors Training in Medicine at an Irish University Teaching Hospital. *Ir J Med Sci* 2016; 185(3): 565-71.
- Koutsogiannou P, Dimoliatis IDK, Mavridis D, Bellos S, Karathanos V, Jelastopulu E. Validation of the Postgraduate Hospital Educational Environment Measure (PHEEM) in a sample of 731 Greek residents. *BMC Res Notes* 2015; 8: 734.
- Shokoohi S, Emami AH, Mohammadi A, Ahmadi S, Mojta-hedzadeh R. Psychometric properties of the Postgraduate Hospital Educational Environment Measure in an Iranian hospital setting. *Med Educ Online* 2014; 19(1):24546.
- Al-Shiekh MH, Ismail MH, Al-Khater SA. Validation of the postgraduate hospital educational environment measure at a Saudi university medical school. *Saudi Med J* 2014; 35(7): 734-8.
- Auret KA, Skinner L, Sinclair C, Evans SF. Formal assessment of the educational environment experienced by interns placed in rural hospitals in Western Australia. *Rural Remote Health* 2013; 13(4): 2549.
- Weigl M, Hornung S, Angerer P, Siegrist J, Glaser J. The effects of improving hospital physicians working conditions on patient care: a prospective, controlled intervention study. *BMC Health Services Research* 2013; 13(1): 401.
- Nasca TJ, Weiss KB, Bagian JP. Improving Clinical Learning Environments for Tomorrow's Physician. *N Engl J Med* 2014; 370: 991-3.
- Rehman R, Ghias K, Fatima SS, Hussain M, Alam F. Students' perception of educational environment at Aga Khan University Medical College, Karachi, Pakistan. *Pak J Med Sci* 2016; 32(3): 720-4.
- Imran N, Khalid F, Haider II, Jawaaid M, Irfan M, Mahmood A, et al. Student's perceptions of educational environment across multiple undergraduate medical institutions in Pakistan using DREEM inventory. *J Pak Med Assoc* 2015; 65(1): 24-8.
- Baig AU, Ahmed SH, Rizvi M, Ilyas MA, Ahmed M, Rehmani MS, et al. Comparison of Educational Environment Perception of Dow Medical College Students with CGPA. *IJR* 2015; 2(9): 72-9.
- Khan JS, Tabasum S, Yousafzai UK. Determination of medical education environment in Punjab private and public medical colleges affiliated with University of Health Sciences, Lahore-Pakistan. *J Ayub Med Coll Abbottabad* 2009; 21(4): 162-170.
- Humayun S, Ashar A, Ahmad A. Students Perception of Labor Room Learning Environment. *Pak Armed Forces Med J* 2014;64 (2): 277-86.
- Saaqi M, Zaman KU. Residents' perceptions of their working conditions during residency training at PIMS. *J Coll Physicians Surg Pak* 2010; 20(6):400-404.
- Khan MNA. Evaluation of the learning environment of teaching hospitals of twin cities in Pakistan [unpublished thesis]. Stellenbosch University, 2014.
- Biggs JS. Postgraduate medical training in Pakistan: observations and recommendations. *J Coll Physicians Surg Pak* 2007; 18(1): 58-63.
- Sheikh S, Kumari B, Obaid M, Khalid N. Assessment of postgraduate educational environment in public and private hospitals of Karachi. *J Pak Med Assoc* 2017; 67(2): 171-77.
- Zeb S, Shahid R, Khan TM. Evaluation of Postgraduate Surgical Educational Environment. *JRMC* 2016; 20(1): 63-66.
- Imran N, Jawaaid M, Haider I I, Masood Z. Bullying of junior doctors in Pakistan: a cross sectional survey. *Singapore Med J* 2010; 51: 592-95.
- Imran N, Azeem Z, Haider II, Amjad N, Bhatti MR. Brain Drain: Post Graduation Migration Intentions and the influencing factors among Medical Graduates from Lahore, Pakistan. *BMC Res Notes* 2011; 4: 417.
- Yousuf A, Ishaque S, Qidwai W. Depression and its associated risk factors in medical and surgical post graduate trainees at a teaching hospital. a cross-sectional survey from a developing country. *J Pak Med Assoc* 2011; 61(10): 9068-73.
- Atif K, Khan HU, Zia-Ullah M, Shah FS, Latif A. Prevalence of anxiety and depression among doctors; the unscreened and undiagnosed clientele in Lahore, Pakistan. *Pak J Med Sci* 2016; 32(2): 294-98.
- Chan CY, Sum MY, Lim WS, Chew NW, Samarasekera DD, Sim K. Adoption and correlates of Postgraduate Hospital Educational Environment Measure (PHEEM) in the evaluation of learning environments - A systematic review. *Med Teach* 2016; 38(12): 1248-55.
- Lee J, Shute VJ. Personal and social-contextual factors in K-12 academic performance: An integrative perspective on student learning. *Educational Psychologist* 2010; 45(3): 185-202.
- Pan TY, Fan HS, Owen CA. The work environment of junior doctors: Their perspectives and coping strategies. *Postgrad Med J* 2017; 93(1101): 414-19.