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EVALUATION OF THE LEARNING ENVIRONMENT OF TEACHING HOSPITALS OF TWIN CITIES IN PAKISTAN

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Declaration:
I the undersigned hereby declare that the work contained in this assignment or article is my original work (literature review and methodology) and that I have not previously submitted it, in it's entirely or in part, at any university for a degree.

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Background

The College of Phycians and Surgeons Pakistan (CPSP) was established in 1962 and its role is to oversee the postgraduate medical education within Pakistan. At present, various specialties belonging to the CPSP carry out quality assurance visits including evaluation of the learning environment of the teaching hospitals by asking the supervisors and doctors in training about the qualification and experience of supervisors, equipment, library, infrastructure and type of work load. The CPSP do not make use of a valid and reliable method when performing these assessments and therefore there is a need for the CPSP to develop a standardized method of assessing the learning environments of the teaching hospitals in Pakistan. This method needs not only to be valid and reliable but also reproducible and transferable so that it can be used to measure the learning environments in various departments and teaching hospitals .It can further be used to compare the learning environments across different teaching hospitals and specialties with in Pakistan.

 The learning environment of teaching hospitals of Pakistan have not been studied before therefore the purpose of this study was to measure the postgraduate learning environment of private and public sector teaching hospitals of twin cities in Pakistan Islamabad and Rawalpindi .Public sector hospitals are fully funded by the government of Pakistan and patients receive free treatment, while private hospitals are commercial hospitals where everything is paid by patients. Following the postgraduate educational environment measurement results between house officers and residents working in the above mentioned environments was then compared. These results can inform supervisors and institutions about short comings as well as strong points with regards to the learning environment.

Materials and Methods

After approval from the Shifa International Hospital`s Ethical committee and Health Research Ethical committee of the University of Stellenbosch, and informed consent were obtained from research participants. The Postgraduate Hospital Educational Environment Measurement questionnaire (PHEEM) was administered to the house officers and residents of six public and one private sector teaching hospital of twin cities (Islamabad and Rawalpindi) in Pakistan with the help of the supervisors of CPSP based at these hospitals. The PHEEM was completed during their respective teaching sessions at the various hospitals .The supervisors was asked to encourage students to complete the PHEEM questionnaire .Supervisors were instructed to

collect the completed questionnaires the from doctors in training at their individual hospitals and then send it back using the enclosed envelope

The PHEEM contains of 40 items covering a range of issues directly related to the clinical learning environment of house officers and residents[1]. These statements make up 3 subscales of the clinical learning environment namely autonomy, social support and teaching. Autonomy (such as the quality of supervision) is represented by 14 statements [1,2,3] teaching (the qualities of teachers by 15 statements[1,4,5] and social support (such as facilities and atmosphere) by 11statements [1,6,7] .Each of the 40 statements can be rated from 0-4 .The respondents are asked to indicate their agreement using a 5 point Likert scale .These range from strongly agree(4) ,agree(3), unsure(2), disagree(1) to strongly disagree (0). Agreement with the items indicates a positive learning environment and will result in high scores. The maximum   possible   scores are 56 for autonomy, 60 for teaching, 44 for social support and an overall score of 160.It is essential that each junior doctor applies the items to their own current learning place[1].

Statistical analysis

The statistical analysis was conducted by using SPSS 16.0 and the four negative items were scored in reverse (question 7, 8, 11, 13). The scores for the total as well as the sub-scales were described by using means and standard deviations (SD). Comparisons of the perception of the educational environments between house officers and residents were expressed as a mean and ± SD and its statistical significance was determined by student t- tests. A p value ≤ 0.05 was considered statistically significant. The results from the three construct of the PHEEM survey were compared among the house officers and residents from surgery, medicine, pediatrics and Obstetrics' and Gynecology by ANNOVA and post hoc sidak test. A p value ≤ 0.05 was considered statistically significant.

Results

The internal reliability of the questionnaire was good with a total Cronbach`s Alpha value of 0.92 (a Cronbach`s alpha of more than 0.7 or 0.8 is accepted as being good) [8]. The questionnaire further revealed Crobach`s alpha value of 0.78, 0.89 and 0.70 for the various subscales of autonomy, teaching and social supports .When this was analyzed to exclude each question in turn, using the alpha if deleted there was no significant improvement in the score, thus confirming all questions were relevant and should be included.

A total of 286 out of 300 (95.33% response rates) house officers and residents belonging to the seven different teaching hospitals of twin cities of Islamabad and Rawalpindi, Pakistan participated in the study. The PHEEM questionnaire was completed by all the participating

doctors composing of 51% house officers and 49 % residents .Both genders were almost equally represented in the two groups comprising of 52% male and 48% female doctors. The distribution of male and female gender is different among respondents from various specialties. There was 23.60% male and 15.03% females in surgery, 22.20% males and 18.30% females in medicines, 6.20% males and 4.32% females in Pediatrics and 10.33% females in obstetrics. House officers and residents belonging to all major specialties took part in the study with the distribution looking as follows, Medicine 44.8%, Surgery 33.6% Obstetrics and Gynecology11.2% and Pedriatics10.50%.

 The mean score (M) and the standard deviation (SD) for each of the subscale namely the perceptions of autonomy, teaching and social support of house officers and residents are shown Table number 1 (Autonomy), Table number 2 (Teaching) and Table number 3 (Social support) respectively. These tables also show the mean of the total scores of each subscale. The lowest recorded score was 1.37 for question number 4.Question number 1, 4,5,9,11,17 and 32 with in the autonomy section were found to have a relatively low rating as shown in table number 1. Teaching quality questions 3, 21 and 33 showed a low rating as demonstrated in table number 2. Social support showed a low rating for question number 19, 20, 25, 26, 36 and 38 again shown in table number 3.

The results from the three subscales of the PHEEM survey were compared between residents and house officers from the teaching hospitals of the twin cities are shown in Table number 1, 2, and 3   respectively. The perception of autonomy was higher amongst residents with a mean of 28.74 compared to house officers 28.27. The difference, however, was not statistically significant between the two groups but there was a statistically significant difference between the two groups in question number 32, where the residents perceived that work load for them was better than house officers. It seems as the residents have better opportunities to access and participate in educational events and programs compared to the house officers seeing that there was a statistically significant difference in question numbers 12 and 21 respectively as shown in table number 1. The perceived level of quality of teaching was higher for residents with mean of 32.02 as compared to the house officers with a mean of 31.12. However this difference was not statistically significant as shown in table 2. The perception of social support was high amongst house officers with a mean of 19.66 compared to residents with a mean of 19.06. There was statistically no difference between the two groups regarding the social support provided at these teaching hospitals; however the house officers felt physically more save compared to residents as shown in table 3

Regarding the difference between private and public sector hospitals, the mean score of the three subscales of the PHEEM, namely the mean score for the perception of autonomy (28.71 vs. 27.14, p=0.24) teaching (33.08 vs. 32.37, p=0.25) and social support (21.94 vs. 21.22, p=0.24) were not statistically significant.

The results from the three subscales of the PHEEM survey were compared amongst the junior doctors from Surgery, Medicine, Pediatrics and Obstetrics' and Gynecology by ANNOVA and post hoc sidak test. There was no statistically significant difference among these junior doctors in the majority of the PHEEM questions. For question number 4, *I had an informative induction programme,* there was statistically significant difference between the junior doctors of medicine and obstetrics & gynecology .Regarding the question number 5, *I had appropriate level of responsibility in this post,* and there was statistically significant difference between junior doctors of surgery & pediatrics and surgery and obstetrics & gynecology. There was significant difference between the junior doctors of medicine and Obstetrics and gynecology for question number 29, *I feel part of the team working here*. Regarding perception of question number *30, I have opportunity to acquire the appropriate practical procedures for my grade*; there was significant difference between the junior doctors of obstetrics & gynecology and surgery.

 For perception of teaching, there was a significant difference between the junior doctors of medicine and obstetrics & gynecology in the following questions. Question number 10: my *clinical teachers have good communication skills;* Question number 23: *my clinical teachers are well organized;* and question number 27*: I have enough clinical learning opportunity of my needs.*

 In the subscale of social support there was a significant difference for item number 13 which states that *there is sex discrimination in this post* between the junior doctors of surgery and pediatrics .The junior doctors from medicine perceive that *there was more calibration among the doctors* of medicine as compared to pediatrics.

Discussion and conclusion

This study shows that the PHEEM questionnaire consists of a practical, reliable and simple set of questions to measure the learning environment of doctors in training at teaching hospitals of Pakistan; a country which is socially, culturally and economically different from the country where this questionnaire was originally constructed. This could imply that the perceptions of

doctors in training are similar regardless of geographical boundaries and economic conditions of the country where they live. . Other studies that employed PHEEM in different parts of the world show similar scores [9, 10, 11,12,13,14].

This study does not show a statistically significant difference between house officers and residents in terms of teaching, role of autonomy and social support. The reasons for this may be that house officers and residents share the same infrastructure for accommodation, catering and social support. Furthermore, there is no practically organized structured training programme with a specified job description for doctors at different levels of training. This study therefore does not confirm results of the studies performed in United Kingdom and Australia, where house officers experienced a better learning environment than residents in many respects[9, 15].

This study was completed by house officers and residents from private as well as public sector teaching hospitals. We did not find a statistical difference in the level of perceptions between doctors in training working in these two different set up of hospitals. This goes against the common notion present amongst junior doctors that training at public sector hospitals have a higher level of satisfaction due to better and more learning opportunities than at private sector hospitals because in these hospitals independent work is not allowed[16].

The result off this study indicates that the perception level of house officers and residents in training in various specialties was different regarding the learning environment. This difference was even more marked for the specialty of Gynecology and obstetrics where the PHEEM items were scored lessened compared to the other specialties. The reason for this could be due to better training opportunities, more structured and availability of mentors in Surgery, Medicine and Pediatrics compared to the female dominated specialty of Gynecology and obstetrics. The female work and learn in different way because they score three items directly related to perception of teaching lower compare to male dominated specialities[15,16,17,18] .

The PHEEM questionnaire results have been taken from seven teaching hospitals of the twin cities, and therefore provide a good overall picture of the learning environments of teaching hospitals in Pakistan seeing that the teaching hospitals of Pakistan almost have similar infrastructure and faculties with few individual variations. This sample represents all major specialties thus provide a good picture of the learning environment for all doctors in training. It is clear that in order to ensure high standards in education and training of junior doctors, the importance of the learning environment cannot be ignored. The following are recommendations

for the CPSP so that they take steps in collaboration with administrative and medical staff to improve the learning environments where needed.

1. A meeting between the CPSP and administrative staff should held every year to overcome the weakness pointed out in this study
2. Teaching hospitals should publish an informative junior doctors hand book , with a job description, responsibilities, expectation and information about working hours
3. The junior doctors should have protected time for educational activities
4. The attendance at educational sessions must be supported by the Supervisors of CPSP
5. Career advice and counseling opportunities should be avaible at each regional center of CPSP
6. Accommodation should meet the appropriate standards
7. Good quality hygienic catering facilities should be present around the clock for junior doctors.
8. Each teaching hospital should administer the PHEEM ever year to measure their quality and potentially improve their standards.

In conclusion this study shows a great need for the creation of a supportive environment as well as designing and implementing interventions to remedy unsatisfactory elements of the educational environment if effective and successful learning is to be realized by the CPSP.

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Q no	Questions	Both House officers and resident M(±SD) n=286	House officer M(±SD) n=146	Residents M(±SD) n=140	P value
1	I have a contact of employment that provides information about working hours	1.86 (±1.32)	1.90 (±1.25)	1.80 (±1.38)	0.41
4	I had an informative induction programme	1.96 (±1.34)	1.97 (±1.17)	1.95 (±1.5)	0.88
5	I have appropriate level of responsibility in this post	1.90 (±1.31)	2.55 (±0.93)	2.77 (±1.06)	0.52
8	I have to perform in appropriate tasks	2.00 (±1.21)	2.08 (±1.17)	1.92 (±1.24)	0.13
9	There is informative junior doctor handbook	1.37 (±1.01)	1.32 (±1.24)	1.42 (±1.20)	0.52
11	I am bleeped/called inappropriately on my mobile phone	1.90 (±1.15)	1.93 (±1.06)	1.87 (±1.20)	0.65
14	There are clear clinical protocols in this post	2.11 (±1.13)	2.13 (±1.10)	2.10 (±1.16)	0.82
17	My working hours are less than 48 hours	1.72 (±1.16)	2.42 (±1.07)	2.47 (±1.04)	0.77
18	I have the opportunity to provide continuity of care	2.45 (±1.05)	1.73 (±1.21)	1.91 (±1.24)	o.66
29	I feel part of the team working here	2.53 (±1.06)	2.50 (±1.01)	2.40 (±1.14)	0.79
30	I have opportunities to acquire the appropriate practical procedures for my grades	2.34 (±1.15)	1.63 (±1.33)	1.47 (±1.32)	0.28
32	My work load is fine in this job	1.55 (±1.05)	1.95 (±1.14)	2.05 (±1.21)	0.001
34	The training in this post makes me feel ready for resident/consultant	2.00 (±1.18)	1.95 (±1.14)	2.34 (±3.74)	1.20
40	My clinical teachers promote an atmosphere of mutual respect	2.24 (±1.21)	2.21 (±2.72)	2.27 (±1.36)	0.20
	Total score of the above items out of 56(Mean)	27.93	28.27	28.74	P=0.269

Table number 1: The scores for autonomy were described by using means and standard deviations (SD). Comparisons of the perception of the educational environments between house officers and residents were expressed as mean and ± SD and its statistical significance was determined by student t tests. A p value ≤ 0.05 was considered statistically significant.

Q no	Questions	Both House officers Residents M(±SD) n=286	House Officers M(±SD) n=146	Resident M(±SD) n=140	P value
2	My clinical teachers sets clear expectations	2.24(±1.16)	2.19(±1.13)	2.28(±1.18)	0.52
3	I have protected educational time in this post	1.63(±1.28)	1.60(±1.27)	1.67(1.29)	0.61
6	I have good clinical supervision at all times.	2.29(±1.16)	2.29(±1.13)	2.28(±1.20)	0.61
10	My clinical teachers have good communication skills	2.48(±1.16)	2.46(±1.21)	2.50(±1.12)	0.93
12	I am able to participate actively in educational events	2.15(±1.24)	1.98(±1.37)	2.0±1.37)	0.05
15	My clinical teachers are enthusiastic	2.37(±1.16)	2.01(±1.19)	2.3(±1.129)	0.35
21	There is access to an educational programme relevant to my needs	1.68(±1.17)	1.54(±1.13)	1.87(±1.19)	0.03
22	I get regular feedbacks from my seniors	2.09(±1.19)	2.10(±1.13)	2.08(±1.25)	o.90
23	My clinical teachers are well organized	2.12(±1.19)	1.81(±1.20)	1.62(±1.23)	0.58
27	I have enough clinical learning opportunities for my needs	2.13(±1.13)	2.40(±1.04)	2.2(±1.25)	0.72
28	My clinical teachers have good teaching skills	2.59(±1.00)	2.41(±1.4)	2.27(±1.25)	0.49
31	My clinical teachers are accessible	2.46(±1.08)	1.96(±1.13)	1.97(±1.15)	0.88
33	Senior staff utilize learning opportunities effectively	1.97(±1.14)	2.23(±1.20)	2.36(±1.13)	0.09
37	My clinical teachers encourage me to be an independent learner	2.34(±1.24)	2.33(±1.18)	2.35(±1.31)	.097
39	The clinical teachers provide me good feedback on my strength and weaknesses	2.02(±1.21)	2.03(±1.17)	2.00(±1.25)	0.18
	Total score of above items out of 60 (Mean)	32.56	31.12	32.02	0.207

Table number 2: The scores for role of teaching were described by using means and standard deviations (SD). Comparisons of the perception of the educational environments between house officers and residents were expressed as mean and ± SD and its statistical significance was determined by student t tests. A p value ≤ 0.05 was considered statistically significant.

Q no	Questions	Both House officers Residents M(±SD)n=286	House Officer M(±SD) n=146	Resident M(±SD) n=140	P value
7	There is racism in this post	2.46 (±1.27)	2.50 (±1.22)	2.42 (±1.33)	0.31
13	There is sex discrimination in this post	2.01 (±1.37)	2.13 (±1.37)	2.04 (±1.37)	0.72
16	I have good collaboration with other doctors in my grade	2.86 (±1.05)	1.73 (±1.11)	1.70 (±1.02)	0.49
19	I have suitable access to career advice	1.82 (±1.23)	1.43 (±1.19)	1.45 (±1.26)	0.23
20	The hospital has good quality accommodation for junior doctors specially when on call	1.46 (±1.22)	1.28 (±1.13)	1.83 (1.19)	0.32
24	I feel physically safe in the hospital environment	2.04 (±1.27)	1.28 (±1.19)	1.17 (±1.21)	0.04
25	There is no blame culture in this post	1.72 (±1.21)	2.10 (±1.05)	2.15 (±1.22)	0.18
26	There is adequate catering facilities when I am on call	1.23 (±1.20)	2.61 (±0.93)	2.56 (±1.04)	0.19
35	My clinical teachers have good mentoring skills	2.29 (±1.16)	2.23 (±1.20)	2.35 (±1.13)	0.95
36	I get a lot of enjoyment out of my present job	1.94 (±1.28)	1.65 (±1.22)	1.77 (±1.23)	0.98
38	There are good counseling opportunities for junior doctors who fail to complete their training satisfactorily	1.71 (±1.23)	1.65 (±1.22)	1.77 (±1.23)	0.83
	Total score of above items out of 44(Mean)	21.54	19.66	19.06	P=0.232

Table number 3: The scores for social support were described by using means and standard deviations (SD). Comparisons of the perception of the educational environments between house officers and residents were expressed as mean and ± SD and its statistical significance was determined by student t tests. A p value ≤ 0.05 was considered statistically significant.

Postgraduate Hospital Education Environment Measure (PHEEM) questionnaire[1]

Please indicate whether you Strongly Agree, Agree, are Unsure, Disagree or Strongly Disagree with the statements below.

Please tick the appropriate box.
Gender: Male……………..Female……………………..
Year in training……………..
Specialty…………………….

Question	Strongly Agree	Agree	Uncertain	Disagree	Strongly disagree
1.I have a contract of employment that provides information about hours of work					
2. My clinical teachers set clear expectations					
3.I have protected educational time in this post					
4. I had an informative induction programme					
5. I have the appropriate level of responsibility in this post					
6. I have good clinical supervision at all time					
7. There is racism in this post					
8. I have to perform inappropriate tasks					
9. There is an informative Junior Doctors handbook					
10. My clinical teachers have good communication skills					
11. I am bleeped/called on my mobile phone inappropriately					
12. I am able to participate actively in educational events					
13. There is sexism in this post					
14. There are clear clinical protocols in this post					
15. My clinical teachers are enthusiastic					
16. I have good collaboration with other doctors in my grade					
17. My working hours are less than 48 hours per weak					
19. I have the opportunity to provide continuity of care					
19. I have suitable access to careers advice					
20. This hospital has good quality accommodation for junior doctors, especially when on call					
21. There is access to an educational programme relevant to my needs					
22. I get regular feedback from seniors					
23. My clinical teachers are well organized					

24. I feel physically safe within the hospital environment					
25. There is a no-blame culture in this post					
26. There adequate catering facilities when I am on call					
27. I have enough clinical learning opportunities for my needs					
28. My clinical teachers have good teaching skills					
29. I feel part of a team working here					
30. I have opportunities to acquire the appropriate practical procedures for my grade					
31. My clinical teachers are accessible					
32. My workload in this job is fine					
33. Senior staff utilize learning opportunities effectively					
34. The training in this post makes me feel ready to be a resident/Consultant					
35. My clinical teachers have good mentoring skills					
36. I get a lot of enjoyment out of my present job					
37. My clinical teachers encourage me to be an independent learner					
38. There are good counseling opportunities for junior doctors who fail to complete their training satisfactorily					
39. The clinical teachers provide me with good feedback on my strengths and weaknesses					
40. My clinical teachers promote an atmosphere of mutual respect					

Review of literature

Introduction

The learning environment of a teaching hospital comprises of a set of factors which affects the learners within that hospital[1, 2, 3]. The environment consists of three parts: the physical (mainly safety, food and comfort); the emotional (personal support, the prevention of bullying and harassment); and the intellectual (includes learning with patients, motivation and structured education) [3]. A good clinical environment ensures the teaching and learning is relevant to the patients and has the active participation of learners, encouraging professional thinking and behavior[4]. There should be good planning and preparation of structure and content, reflection on learning, and evaluation of what has happened in the learning and teaching[3].

The common problems with teaching and learning in the clinical environment: include lack of clear objectives; focus on knowledge rather than problem solving skills; teaching at the wrong level; passive observation; little time for reflection and discussion as well as teaching by humiliation[3]. Training and learning in the teaching hospitals is a challenging period for doctors in training[5]. Junior doctors in training have to learn to balance diverse demands, such as responsibility for patient care, economic hardships, on-call schedules, patient deaths, need for constant learning, task of teaching, requirements of attending physicians and senior residents along with the necessities of family and personal life[5]. The clinical environment encompasses many important aspects, such as difference in the orientation toward learning, the level of autonomy, type of work load , quality of supervision, quality of opportunities to learn important skills, avaibilty of resources, facilities and atmosphere to learn and research[5].

Measurement of clinical learning environment

The learning environment of teaching hospitals can foster or inhabit ability of junior doctors to develop into competent doctors[6]. The features that foster or inhibit learning in the clinical environment must be identified, prioritized and measured to manage curriculum development change to enhanced the learning and to achieve the leaner`s goals[6]. Therefore it is very important to evaluate the learning environment in clinical settings. There are only few instruments like Dundee ready educational environment measure (DREEM)[7],Anesthesia education environment measure (ATEEM)[8] Surgical theater educational environment measure (STEEM)[9] and Postgraduate hospital educational environment measure (PHEEM)[10] that specifically assess the quality of learning environment in hospital settings.

Instruments to measure clinical learning environment

Investigation of previous effort to study effective learning environments resulted in the development of a questionnaire for undergraduate students in health professional education[7]. The 50- item Dundee Ready education environment measure (DREEM) used a standard methodology grounded in education theory together with a Delphi panel of nearly 100 professional health educators from all around the world[7]. Five i.e students' perceptions of teaching, teacher's academic self-perception, atmosphere and social self-perception have been identified and developed[7].

A similar methodology was used to develop ATEEM[8], STEEM[9] and PHEEM instrumensts[10]. ATEEM was developed as a specific tool to measure the learning environment for anesthetist in training in clinical settings[8]. It includes dimensions like role of autonomy, atmosphere, supervision/ workload/ support, teachers, teaching and learning opportunities, and orientation to learning for anesthetist[8]. STEEM, an instrument measures the learning environment in the surgical operating theatre[9]. STEEM consists of four dimensions for teaching and training, learning opportunities, atmosphere, and supervision/ workload/ support in surgical theaters for surgical trainees[9]. PHEEM was developed to assess the clinical learning environment for junior doctors in training[10]. PHEEM consist of three dimensions for autonomy, teaching and social support for hospital based junior doctors in training regardless of their specialty[10].

The PHEEM

The PHEEM contains of 40 items covering a range of issues directly related to the clinical learning environment of house officers and residents[10].PHEEM can identify specific strengths and weakness within a certain leaning environment[10] .These statements make up 3 dimensions of the clinical learning environment namely autonomy, social support and teaching. Autonomy (such as the quality of supervision) is represented by 14 statements [11, 12], teaching (the qualities of teachers) by 15 statements [13, 14] and social support (such as facilities and atmosphere) by 11 statements[15, 16,]

Psychometric analysis of the PHEEM

PHEEM was constructed to assess three dimensions of clinical learning environment in hospital settings, which are the perception of role autonomy, perception of teaching and perception of social support[10]. Psychometric analysis of the PHEEM by Boor et al in Denmark showed that it is one dimensional instrument and does not measure three dimensions of the learning

environment in clinical setting[5]. However the psychometric analysis performed by other researchers does not confirm their findings, they prove that the PHEEM is multidimensional instrument in terms of the defined sub-scales and explanatory analysis and measure three domains of clinical learning environment i.e perception of role autonomy, teaching and social support[17, 18].

Validity and reliability of the PHEEM

The PHEEM instrument has been validated throughout the world. The internal reliability of PHEEM has been calculated by using Cronbach`s alpha. The three subscales: perception of role autonomy, perception of teaching and social support shows a very high reliability using Cronbach`s alpha of 0.91[10]. The PHEEM used for doctors in training in nine intensive care schemes in England and Wales demonstrated a high reliability of 0.92[17]. PHEEM has been validated in a wide selection of hospital departments in Denmark, revealed reliability of 0.93[19]. The modified Srilankain version of PHEEM shows Cronbach`s alpha value of 0.84[20]. The Spanish and Portuguese translations of PHEEM revealed Cronbach`s alpha of 0.95 and 0.89 respectively[21, 22]

Sample size required to achieve a reliable evaluation of the clinical learning environment

Boor et al suggested that to achieve a reliable evaluation of the clinical learning environment, 14 completed questionnaires of Postgraduate hospital educational environment measurement can establish a reliable score for house officers, whereas 11 completed questionnaires are needed to establish a reliable score for residents[5]. The numbers of respondents needed to obtain a reliable outcome for a group of department or hospitals are same for both house officers and residents: for 10 departments, 3 questionnaires per department are needed. The reliability can be improved by increasing the number of departments rather than increasing the number of respondents[5].

Practicality of the PHEEM

The PHEEM questionnaire takes less than five minute to complete[17]. Coding the questionnaire and calculating the scores for individuals are quick and easy[17]. The method of interpretation suggested by Roff et all also takes less than five minutes[17].

Scoring of the PHEEM

Each of the 40 statements can be rated from 0-4 .The respondents are asked to indicate their agreement using a 5 point Likert scale[10] .These range from strongly agree(4) ,agree(3), unsure(2), disagree(1) to strongly disagree (0).However ,4 of the 40 items (Number 7,8,11 and 13) are negative statements and should be scored: strongly agree(0) ,agree(1), unsure(2), disagree(3) to strongly disagree (4).

 Agreement with the items indicates a positive learning environment and will result in high scores. The maximum possible scores were, 56 for autonomy, 60 for teaching, 44 for social support and an overall score of 160 [10]. A score of 0 is the minimum and would be a very worrying result for any medical educators. It is important that each respondent applies the items to their own current learning situation[10].

Interpretation of the scores of The PHEEM

A guide to interpret the overall Score of the PHEEM[10, 23]

The following is a guide to interpreting the overall score.

0-40   Very poor

41-80   Plenty of problem

81-120   More positive than negative but room for improvement.

121-160   Excellent

A guide to interpret the score of three constructs of PHEEM is shown below[10, 23]

Perception of role of autonomy by junior doctors in training: [23] (14 items, max. scores 56)

0-4   Very poor

15-28   A negative view of one's role.

29-42   A more positive perception of one's job

43-56   Excellent perception of one's job.

Perception of teaching by junior doctors in training: [23] (15 items, max. score 60)

0-15	Very poor quality
16-30	In need of some re-training
31-45	Moving in the right direction
46-60	Model teachers

Perception of junior doctors in training regarding social support avaible[23]. (11 items, max. score 44)

0-11	Non-Existent
12-22	Not a pleasant place
23-33	More social support avaible.
34-44	A good supportive environments

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Table 1: The PHEEM-items grouped by subscale[10]

(Negative items in italics)

I   Perceptions of role autonomy

1.   I have a contract of employment that provides information about hours of work

4.   I had an informative induction programmed.

5.   I have the appropriate level of responsibility in this post

8.   I have to perform inappropriate tasks.

9.   There is an informative junior doctors Handbook

11   I am bleeped inappropriately or call on my mobile phone

14.   There are clear clinical protocols in this post

17.   My working hours are less than 48 hrs per week

18.   I have the opportunity to provide continuity of care

29.   I feel part of a team working here.

30.   I have opportunities to acquire the appropriate practical procedures for my grades

32.   My workload in this job is fine.

34.   The training in this post makes me feel ready to be a resident / consultant.

40.   My clinical teachers promote an atmosphere of mutual respect.

i.e.   14 items/ max score 56 for this subscale.

II   Perceptions of Teaching:

2.   My clinical teachers set clear expectations

3.   I have protected educational time in this post

6.   I have good clinical supervision at all time

10.   My clinical teachers have good communication skills

12.   I am able to participate actively in educational events

15.   My clinical teachers are enthusiastic

21.   There is access to an educational program relevant to my needs

22.   I get regular feedback from seniors

23.   My clinical teachers are well organized

27.   I have enough clinical learning opportunities for my needs

28.   My clinical teachers have good teaching skills

31.   My clinical teachers are accessible

33.   Senior staff utilizes learning opportunities effectively

37.   My clinical teachers encourage me to be an independent learner

39.   The clinical teachers provide me with good feedback on my strengths and weaknesses

i.e.   15 items/max score 60 for this subscale

III   Perceptions of Social Support:

7.   There is racism in this post

13.   There is sex discrimination in this post

16.   I have good collaboration with other doctors in my grade

19.   I have suitable access to careers advice

20.   This hospital has good quality accommodation for junior doctors, especially

when on call

24.   I feel physically safe within the hospital environment

25.   There is a no-blame culture in this post

26.   There are adequate catering facilities when I am on call

35   My clinical teachers have good mentoring skills

36.   I get a lot of enjoyment out of my present job

38.   There are good counseling opportunities for junior doctors who fail to complete their training

satisfactorily

i.e.   11 items/ max score 44 for this subscale