RESEARCH ARTICLE

Postgraduate residents' perception of the clinical learning environment; use of postgraduate hospital educational environment measure (PHEEM) in Pakistani context

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Abstract

Objectives: To evaluate the perception of postgraduate residents about the clinical educational environment and to investigate the association of their perception with different specialities and years of residency.

Methods: The study was conducted in August 2016 at The Children's Hospital, Lahore, Pakistan, and comprised postgraduate residents who were asked to complete postgraduate hospital educational environment measure questionnaire. The residents' individual perception scores were calculated and the means of both individual domain and global score of the questionnaire were compared by different specialities and different levels of residency training year. SPSS 20 was used for statistical analysis.

Results: Of the 160 residents who completed the questionnaire, 114(71.3%) were related to paediatric medicine. The residents perceived their educational environment positive with a global mean score of 88.16±14.18. Autonomy and teaching were rated most highly by paediatric diagnostic residents, i.e. 32.23±8.148 and 36.23±9.010, respectively. Social support was rated the highest by paediatric surgery residents 24.36±4.653. There was no significant difference of perception between different specialities (p=0.876) or different years of residency (p=0.474).

Conclusion: Postgraduate hospital educational environment measure can be used to identify areas of strengths and weaknesses in a hospital environment. Educational environment of study site was more positive than negative.

Keywords: Postgraduate, Residency training, Perception, Hospital environment. (JPMA 68: 417; 2018)

Introduction

The provision of high-quality healthcare services is an important goal for patient safety. Among the major aims of health system for public, the training of physicians who are the ultimate service providers, is an important target.[1] There is a unique contribution of the environment to knowledge, thinking and learning of medical students.[2] Educational environment hugely impacts the learning process and this may have profound effect on students' performance, their behaviour and outcome of curriculum.[3] Students' satisfaction, success and achievement have been linked to educational environment.[4] A good educational environment is the one in which teaching and learning opportunities are well planned and patient-focused with good medical practices.[5] For better training, an effective training programme and a positive learning environment in which postgraduate trainees are supervised, nurtured and trained is essential which ultimately leads to improved patient care.[6] Almost all of the training received by postgraduate residents is within hospital programmes. So bedside teaching, if not properly planned, can be a source of many mistakes.[7] Comprehensive evaluation of problems related to the quality of training provided and learning environment is required for improved training and patient care.[8]

The development and use of various instruments which evaluate the quality of training programmes in daily clinical practice is a step towards training perfection. Many validated instruments are developed in various countries targeting improvement in training programmes. These are the Dundee Ready Educational Environment Measure (DREEM) for undergraduate health professional education,[9] Anaesthetic Theatre Educational Environment Measure (ATEEM),[10] and Surgical Theatre Educational Environment Measure (STEEM),[11] etc.

For the assessment of educational environment of junior doctors in hospitals, the Postgraduate Hospital Educational Environment Measure (PHEEM) is used. The PHEEM instrument, a validated 40-item questionnaire developed in the United Kingdom (UK) by Roff et al. was used to rate various aspects of the clinical learning environment for postgraduate training.[12] A significantly high level of reliability (Cronbach's alpha coefficient > 0.91) of the PHEEM inventory is documented.[13] The three

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domains measured by this inventory are: perception of autonomy (very poor to excellent perception of one's job), perception of teaching (very poor quality through model teaching) and perception of social support (none to good supportive environment).

Literature search reveals only few studies in Pakistan about the educational environment for postgraduate residents exploring the relative contributions of different factors involved.[14,15] This research focuses on the clinical educational environment of the hospital. It was planned to determine how postgraduate residents perceive their clinical learning environment and to investigate the association of their perception with different specialities and years of residency, with possible implications for improvement in clinical learning environment.

Subjects and Methods

This hospital-based, cross-sectional study was conducted in August 2016 at The Children's Hospital, Lahore, Pakistan, and comprised postgraduate residents in the tertiary care hospital with 650 beds and around 250 postgraduate residents. To assess the educational environment of the residency programme of the hospital, the English version of PHEEM was used. After taking permission of the author of the PHEEM questionnaire inventory, S. Roff, her questionnaire was adapted to Pakistani context. Two questions (item 11: 'I am bleeped inappropriately', and item 17: 'My hours conform to the New Deal') in the autonomy section were not appropriate for our set-up, so they were rephrased to (11: 'I am called for inappropriate duties', and 17: 'My hours of work are in accordance with my contract'). Approval for the study was taken from the institutional ethics committee. The study population included paediatric medicine, paediatric surgery and diagnostic specialities of radiology and pathology residents. Open Epistatistical calculator was used for sample size calculation. The sample size was calculated with 95% confidence level and 5% margin of error. The questionnaire was distributed to postgraduate residents present on job. Informed consent was obtained from all participants. Survey was anonymous as residents were asked to complete the questionnaire without indicating their names. Five-point Likert scale was used, with options being, 4= strongly agree (SA), 3= agree (A), 2= uncertain (U), 1= disagree (D), 0= strongly disagree (SD) to assess residents' response. Higher level of agreement was correlated with more effective clinical educational environment. However, four of the 40 items (7, 8, 11 and 13) were negative statements and were scored in reverse order, i.e. 0=SA, 1=A, 2=U, 3=D and 4=SD, and were written in italics. The interpretation of sub-scales is:

I: Perception of role autonomy: 14 items with maximum score of 56; 0-14=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.

II: Perceptions of teaching: 15 items with a maximum of 60;0-15=very poor quality; 16-30=in need of some retraining; 31-45= moving in right direction; 46-60= model teaching

III: Perceptions of social support: 11 items with a maximum of 44; 0-11= non-existent; 12-22= not a pleasant place; 23-33= more positive than negative; 34-44=a good supportive environment.

The sum of these scores ranged from zero to a maximum of 160.

The interpretation of these combined scores is given by the tool developer[12] as:

0-40 is very poor educational environment; 41-80 significant problems; 81-120 is more positive than negative but room for improvement; and 121-160 indicates an excellent clinical educational environment.

The names of the participants were kept confidential. Demographic data included resident's year of residency, speciality, gender and age. SPSS 20 was used for data analysis. Descriptive statistics included frequencies and percentages for categorical variables and mean and standard deviations for continuous variables. For statistical analysis, chi-square test was used. $P<0.05$ was considered statistically significant.

Results

Of the 190 students, 160(84.2%) completed the PHEEM questionnaire. Of the total 114(71.3%) participants belonged to paediatric medicine, followed by surgical 25(15.6%) and diagnostic 21(13.1%) specialities. Moreover, 96(60%) were females and 64(40%) males. The overall mean age of the residents was 28±1.183 years (Table-1).

The mean item scores varied from 1.015±1.137 to 2.79±0.802. The lowest-rated score was item 26, 'there was adequate catering facility when I am on call', while the highest-rated score was item 13, 'I have good collaboration with other doctors in my grade'. A more suitable supportive educational environment is indicated by rating higher than 2. Except for seven responses with a mean score of more than 2.5 ('appropriate level of responsibility in this post', 'feel part of a team working', 'practical procedures appropriate for grade', 'good communication skill of teacher', 'good teaching skills,

Table-1: Characteristics of residents who participated in the study.

Category	Total n = 160
Age	
Mean	28 ± 1.813 Years
25-30 years	145 (90.6%)
31-35 years	15 (9.4%)
Gender	
Male	64 (40%)
Female	96 (60%)
(M:F)	
Paediatric Medicine	(M= 45; 39.5% F= 69; 60.5%) 2:3
Paediatric Surgery	(M= 17; 68.0% F= 08; 32.0%) 2:1
Paediatric Diagnostic	(M= 2; 9.5% F= 19; 90.5%) 1:10
Year of Post Graduate Training	
1st Year	27 (16.8%)
2nd Year	38 (23.8%)
3rd Year	41 (25.6%)
4th Year	38 (23.8%)
Training Complete	16 (10.0%)
Speciality	
Paediatric Medicine	114 (71.3%)
Paediatric Surgery	25 (15.6%)
Paediatric Diagnostic	21 (13.1%)

teachers are accessible', 'good collaboration with other doctors of my grade'), all other questions showed relatively low rating. Items 9 and 32 in the autonomy section ('informative junior doctors hand book' and 'workload in job is fine') and items 3 and 22 within the teaching quality section ('protected educational time' and 'feedback from senior staff') were found to have very low rating. Social support items 26 and 38 (catering facility and counselling facilities in case of failure to complete training) also showed significantly low rating ($p<0.05$).

As for the four negative questions, items 8, 'I have to perform inappropriate tasks', and 11,'I am called for inappropriate duties', in the autonomy domain scored 1.77 1.265 and 2.21 1.220 respectively. In social support, items 7, 'there is racism in this post', and 13, 'there is sex discrimination in this post', scored 2.59 1.106 and 2.39 1.177 (Table-2).

Results from the three sections of PHEEM inventory were compared. The level of autonomy and teaching quality was perceived higher by the residents of paediatric diagnostic as compared to paediatric medicine and paediatric surgery, but this difference was not significant

Table-2: PHEEM inventory with mean and standard deviation.

PHEEM INVENTORY		
Perception Of Role Autonomy		
Item no.	**Question**	**Mean**
1	I have a contract of employment that provides information about hours of work	1.56±1.273
4	I had an informative induction programme	2.15±1.139
5	I have the appropriate level of responsibility in this post	2.70±0.903
8#	I have to perform inappropriate tasks	1.77±1.265
9	There is an informative Junior Doctors Handbook	1.36±1.135
11#	I am called for inappropriate duties	2.21±1.220
14	There are clear clinical protocols in this post	1.92±1.104
17	My hours of work are in accordance with my contract of training	1.74±1.037
18	I have the opportunity to provide continuity of care	2.47±0.958
29	I feel part of a team working here	2.66±0.965
30	I have opportunities to acquire the appropriate practical procedures for my grade	2.71±1.048
32	My workload in this job is fine	1.28±1.249
34	The training in this post makes me feel ready to be a Specialist/ Consultant	2.28±1.106
40	My clinical teachers promote an atmosphere of mutual respect	2.48±1.040
Perceptions of Teaching		
2	My clinical teachers set clear expectations	2.48±0.977
3	I have protected educational time in this post	1.75±1.144
6	I have good clinical supervision at all times	2.12±1.168
10	My clinical teachers have good communication skills	2.71±0.835
12	I am able to participate actively in educational events	2.35±1.065
15	My clinical teachers are enthusiastic	2.20±1.159
21	There is access to an educational programme relevant to my needs	2.13±1.105
22	I get regular feedback from seniors	1.98±1.079
23	My clinical teachers are well organised	2.42±0,975
27	I have enough clinical learning opportunities for my needs	2.33±1.091

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28	My clinical teachers have good teaching skills	2.67±0.902
31	My clinical teachers are accessible	2.54±0.964
33	Senior staff utilise learning opportunities effectively	2.30±0.970
37	My clinical teachers encourage me to be an independent learner	2.33±1.044
39	The clinical teachers provide me with good feedback on my strengths and weaknesses	2.04±1.472
Perceptions of Social Support		
7#	There is racism in this post	2.59±1.106
13#	There is sex discrimination in this post	2.39±1.177
16	I have good collaboration with other Doctors in my grade	2.79±0.802
19	I have suitable access to careers advice	1.83±1.077
20	This hospital has good quality accommodation for junior doctors, especially when on call	1.65±1.304
24	I feel physically safe within the hospital environment	1.77±1.322
25	There is a no blame culture in this post	1.83±1.216
26	There are adequate catering facilities when I am on call	1.05±1.137
35	My clinical teachers have good mentoring skills	2.33±1.013
36	I get a lot of enjoyment out of my present job	1.73±1.175
38	There are good counselling opportunities for junior doctors who fail to complete their training satisfactorily	1.61±1.218

Item 8, 11, 7, 13 #: written in italic are negative and scored in reverse order.
PHEEM: Postgraduate hospital educational environment measure.

Table-3: Comparison of PHEEM perception among residents of paediatric medicine, paediatric surgery, paediatric diagnostics (mean ± SD).

Perception of educational environment	Maximum Score	Paediatric Medicine (n=114)	Paediatric Surgery (n=25)	Paediatric Diagnostic (n=21)	P-value
Autonomy	56	28.88 ± 7.33	29.84 ± 5.52	32.23 8.14	0.325
Teaching Quality	60	33.09 ± 9.94	33.96 ± 9.04	36.23 ± 9.01	0.202
Social Support	44	20.91 ± 6.82	24.36 ± 4.65	21.85 ± 6.65	0.790
Total Score	160	83.88 ± 20.28	88.16 ± 14.18	88.80 ± 20.04	0.876

PHEEM: Postgraduate hospital educational environment measure.
SD: Standard deviation.

Table-4: Interpretation of PHEEM overall and subclasses scores.

PHEEM and its Subclasses	Maximum Score	Resident's Mean Score	Score interpretation
All items	160	85.19±19.435	More positive than negative but room for improvement
Autonomy	56	29.27±7.090	A more positive perception of one's job
Teaching Quality	60	34.35±9.661	Moving in right direction
Social Support	44	21.58±6.596	Not a pleasant place

PHEEM: Postgraduate hospital educational environment measure.

(p=0.325) and (p=0.202) respectively. Both paediatric medicine and paediatric surgery residents had almost the same perception of autonomy and teaching. Only paediatric surgery residents rated social support higher in the acceptable range of more positive than negative (24.36±4.65), but this difference was also not statistically significant (p=0.790) (Table-3) (Figure).

The mean total score of PHEEM questionnaire of those residents who had completed their training and not yet appeared in exit exam was higher (95.13±17.847) than postgraduate residents in the early years of residency programme (86.71±19.896) and the last years of residency (81.05±18.299). There was no difference in autonomy and social support but the teaching quality was rated much higher by the residents who had completed their training (41.50±8.839) as compared to those who were in early and later years of residency (33.13±8.996).

The residents perceived their educational environment positive with a global mean score of 88.15±19.435, describing the educational environment more positive than negative but suggesting room for improvement. Each subclass score was 29.27±7.090, 34.35±9.661 and 21.58±6.596 for autonomy, teaching and social support, respectively (Table-4).

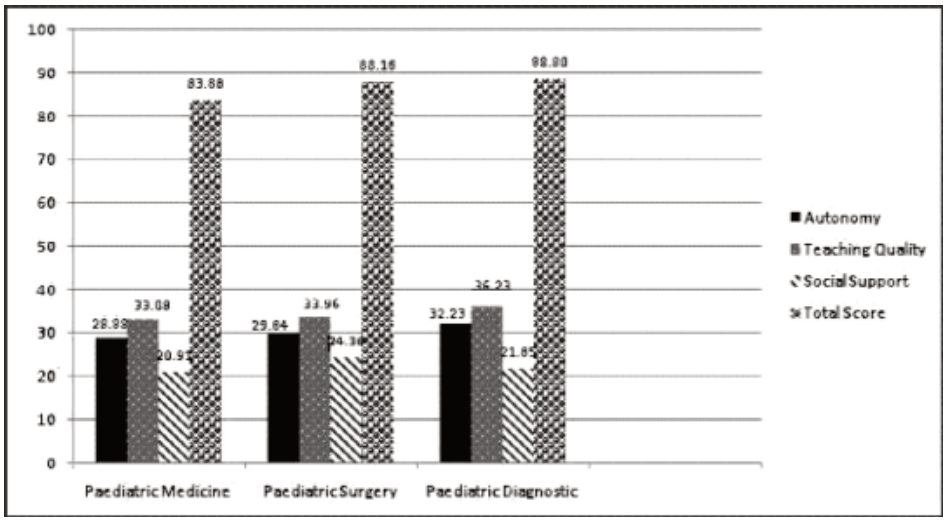

Figure: Different paediatric specialities and mean scores of PHEEM.

Discussion

Using published guide to interpret mean scores in the current study showed that all postgraduate residents had a more positive perception with regard to the level of autonomy (29.27). The teaching quality also had good perception with moving in right direction (34.35), but in terms of the provision of social support there was a negative perception of 'not a pleasant place' (21.58). This teaching subclass score were consistent with another study.[16] Our total PHEEM score was 85.19±19.435, which is consistent with studies done in Ireland (82.88) and Saudi Arabia (82.64), interpreting the educational environment as more positive than negative,[6,7] and better than studies done by Binsaleh (77.7) and Khoja which (67.1).[17,18] One study from Pakistan showed a much greater score.[15] Many other studies also showed a higher global mean score than our study,[8,14,19,20] and this difference was probably due to the fact that our social support was scored very low. The other reason for low score as compared to other studies, especially the one from Pakistan, is that our hospital is the biggest paediatric tertiary care hospital in Pakistan which receives referrals of undiagnosed, complicated and very sick children from all over the country and therefore residents face a huge workload.

The mean scores of individual questions in all three subclasses provided us the opportunity to look into the weaknesses and also into the strengths of the educational environment offered to the residents of our hospital. In our study, 16 out of 40 PHEEM items (majority from social support and autonomy domains) had very low score. This finding is quite alarming for us, especially for the hospital administration, faculty involved and the department of medical education of our hospital.

Analysis of our quantitative data showed that deficiencies exist in various aspects of clinical educational environment. Those items with mean sore between 2-3 need improvement. In our study, there was no overall real positively rated item with a mean score of 3 or > 3, while 16 items were scored poorly with a mean score of 2 or less, pointing towards problem areas and should be looked into more closely. The lowest rated item was item 26 (about catering facility while on call). The other poorly rated areas of special concern were item number 1, 8, 9, 14, 17, and 32 from the autonomy domain and were about contract of employment, hours of work, inappropriate tasks to perform, junior doctors handbook, presence of clear clinical protocols and job workload. Poorly rated items from the teaching domain were 3, 22 and 39 which define protected education time, feedback from seniors and from clinical teacher about strengths and weaknesses. These were perceived weaknesses by the residents' which need improvement. Social support was poorly rated in items 19, 20, 24, 25, 36 and 38 which were about suitable access to career advice, good quality hospital accommodation when on call, blame culture, catering facility when on call, enjoyment out of present post and counselling facilities for junior doctors who fail to complete the training. Weak items in social support provision should be highlighted. Most of the weaknesses identified in our study were consistent with the study done by Lucas et al.[21] In our study, the majority of PHEEM items scored around 2, which was consistent with a study done by Binsaleh et al.[17] Few items scored more than 2.5 which were mostly from the autonomy and teaching domains. In social support, only one item scored higher mean value. It is important to address the items in teaching quality and social support to improve the educational environment of postgraduate residents.

The items which scored lower in our study are not difficult to solve, as our emergency treatment guideline protocol book has been published and is available for all residents, and another book with all paediatric diseases guideline clinical protocols is to be published soon. Good catering facility is also not a big deal and can be managed by the hospital administration. Due importance should be given

to faculty training in providing timely and constructive feedback and providing counselling services to those residents who fail to complete training.

However, the current study had its limitations as its results might have been influenced by smaller number of residents in surgical and diagnostic specialities. Our hospital has 10 paediatric sub-specialities in which residents are rotated during their training period, so one of the confounding factors may be the resident's rotation in a ward with less supportive environment at the time of data collection.

Conclusion

PHEEM inventory was found to be a reliable and valid tool for measuring the educational environment of postgraduate training programme anywhere in the world. It may require minor rephrasing to be used in a different context. Paediatric residents perceived their clinical educational environment as positive. The overall educational environment of our hospital was found to be more positive than negative with plentiful room for improvement.

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