ORIGINAL ARTICLE

Assessment of postgraduate educational environment in public and private hospitals of Karachi

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Abstract

Objectives: To assess the environment of postgraduate fellowship training in teaching hospitals of an urban centre.

Methods: The cross-sectional study was conducted at one public-sector and two private-sector teaching hospitals in Karachi from December 2014 to June 2015. Data was collected by using a modified version of Postgraduate Hospital Educational Environment Measure, a validated questionnaire, for which clinical residents were selected through convenience sampling. Data was analyzed using SPSS 16.

Results: Of the 302 participants, 168(55.6%) were males and 134(44.4%) were females. The overall mean age of the respondents was 28.46±3.03 years. The internal reliability of the questionnaire was good with a Cronbach's alpha of 0.92. The overall mean score of 93.96±20.79suggested more positive than negative perception with room for improvement. After adjusting for all important socio-demographic and residency co-variates, residency in a private hospital was positively associated with Postgraduate Hospital Educational Environment Measure score ($p<0.01$) compared to residency in public hospitals.

Conclusion: There is an urging need to standardise postgraduate training in terms of teaching, autonomy and social support in public and private hospitals of Karachi.

Keywords: PHEEM, Postgraduate training, Residency, Quality. (JPMA 67: 171; 2017)

Introduction

Provision of quality environment in training junior doctors is emerging as a subject of great interest with proliferation of new teaching hospitals and postgraduate programmes, especially in the developing countries. As a result, training requirements have increased in modern times and now involve vast areas of management, team work, supervision, social support and research. Understanding the environment of these programmes is imperative to manage them effectively and improve their performance.[1,2] Moreover, a good learning and teaching environment is also directly related to good professional performance of junior doctors.[3] There is rich evidence on the benefits of improving the educational and environmental aspects of hospital training in improving performance of junior doctors.[4-7] Therefore, good planning for clinical teaching is essential, otherwise grave medical errors may result.[8]

Globally, postgraduate medical training programmes have been standardised and are kept under a tight check to provide an acceptable standard of active training to its residents (trainees). In Pakistan, postgraduate training for various disciplines of medicine and surgery is done in accredited tertiary care hospitals for a period of 4-5 years depending on the specialty after passing an exam and registering with the College of Physicians and Surgeons of Pakistan (CPSP). Few standards are in place related to accrediting hospitals as being fit to offer training and mandatory trainings are given to supervisors in areas of educational planning and evaluation, assessment of competence, supervisory skills and research.[9] However, a proactive supervised evaluation of training standards is not in effect in Pakistan and there is variation in the proficiency and excellence of the training programmes in different hospitals throughout Pakistan.[10] To our knowledge, no study had been done in the country based on perceptions of resident trainees to assess the education environment of postgraduate training using a standardised validated tool. This study was planned to assess the education environment of postgraduate fellowship training and to identify differences in public-sector and private-sector tertiary care hospitals.

Subjects and Methods

The cross-sectional study was conducted in one public-sector and two private-sector hospitals in Karachi from December 2014 to June 2015. The list of residents was obtained from the administration of the relevant hospitals and all the residents from each discipline were approached. We expected to achieve a sample size of 191 calculated at 99% confidence level, 5% margin of error and expected variance of 721 taken from a previous

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study.[11] However, our sample size was much larger after convenience sampling technique was employed.

The data was collected using a modified version of Postgraduate Hospital Educational Environment Measure (PHEEM) which has been evaluated as a reliable tool to measure the educational environment of postgraduate training programmes[12-14] and has been used in several countries to assess clinical training.[11,15,16] The 40-item questionnaire developed by Roff S.[17] comprehensively evaluates the learning environment in hospital settings for residents by measuring perceptions of trainees in three domains: perceptions of autonomy, teaching and social support. Reponses are recorded on five-point agreement Likert scale and each item is given a score from 0-4. Responses generate a maximum score of 160 with scores of 0-40 meaning very poor, 41-80 portraying plenty of problems, 81-120 explaining more positive than negative with room for improvement, and 121-160 as excellent. In order to pinpoint more specific strengths and weaknesses based on individual items, a mean score of 3.5 or above is considered a real positive result. Any item with a mean of 2 or less is examined more closely as they indicate problem areas. Items with a mean between 2 and 3 are aspects of the climate that could be enhanced. Items in the questionnaire were modified to match the local applicability. The following questions were modified:

In question no. 7, "There is racism in this post" was changed to "there is ethnic or religious discrimination in this post".

In question no. 9, "There is an informative Junior Doctors Handbook" was changed to "There is a document on structured training specifying core competencies to be acquired at different levels".

In question no. 11, "I am bleeped inappropriately" was changed to "I am called inappropriately" (as all resident do not have pagers in all hospitals).

In question no. 17, "My hours conform to new deal" was changed to "My working hours are appropriate" (as there is no resident work time directive in Pakistan).

The data was collected by medical students. They were thoroughly trained about the objectives of the study and the questionnaire. Field testing of the final questionnaire was done before starting the formal data collection. The questionnaire was modified based on the feedback of the students after pilot testing. Data collection process was supervised by principal investigator throughout the data collection process. Forms were checked for completeness. Data was entered twice and consistency between the two data sets was checked.

Ethical approval was obtained from the Institutional Review Board of Jinnah Sindh Medical University. Official Permission was taken from administrations of all the hospitals where the data was collected. The names of hospitals have been kept confidential. All participants gave informed written consent prior to getting enrolled in the study.

The data was entered on SPSS 16.0 and cross-validated by random checking. Reliability of responses was checked using Cronbach's alpha. Frequencies and percentages were calculated for categorical variables, while means and standard deviations were calculated for continuous variables. Overall PHEEM score and score of its three domains (autonomy, teaching and social support) was categorised into three levels with different cut-off scores and their frequencies and percentages were calculated. After checking for normality of distribution, overall PHEEM scores and scores of its three domains were summarised as mean±standard deviation.

After checking for normality of distribution, Independent T-test was used to compare the overall mean scores of PHEEM and each of its items between public and private hospitals. Generalised Linear Regression analysis was used to examine the unadjusted and adjusted association between independent variables, including gender, type of hospital, hometown, residency specialty, household monthly income and dependent variable that is, PHEEM scores. Results were reported as Beta Coefficients with 95% confidence intervals (CI). $P<0.05$ was considered significant.

Results

Of the 350 individuals invited for participation, 320(91.4%) consented, but 18(5.6%) of the entries had to be excluded due to incomplete information. The final sample stood at 302(94.4%) participants. The overall reliability of PHEEM score was high with Cronbach's alpha being 0.917 (Table 1).

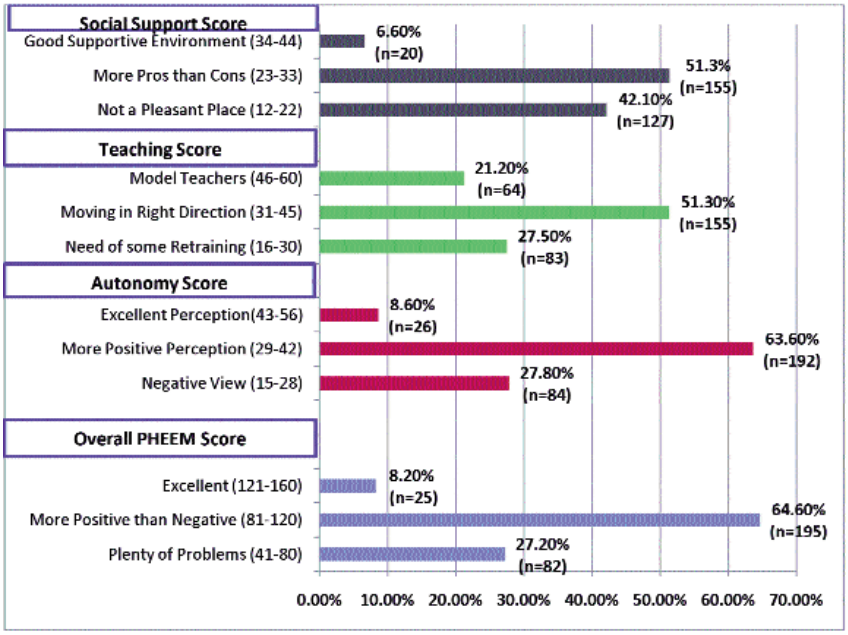
There were 168(55.6%) males and 134(44.4%) females with an overall mean age of 28.46±3.03 years. Overall, 112(37%) residents were married; 171(56.6%) had family income less than Pak rupees (PKR) 100,000; 131(43.4%)

Table-1: Reliability of Responses on all Components of Study (n=302) (Karachi, 2015).

Component	Cronbach's α
PHEEM Score	0.917
Perception of Role Autonomy	0.762
Perception of Teaching	0.880
Perception of Social Support	0.724

Table-2: Descriptive characteristics of respondents (n = 302) (Karachi, 2015).

Variable	N	%
Gender		
Male	168	55.6
Female	134	44.4
Marital Status		
Single	186	61.6
Married	112	37.1
Divorced	04	1.3
Household Monthly Income		
Less thanPKR 100,000/-	171	56.6
PKR 100,000/-and above	131	43.4
Hometown		
Karachi	163	54.0
Outside Karachi	139	46.0
Type of Hospital, where employed		
Public	130	43.0
Private	172	57.0
Residency Specialty		
Medicine & Allied	113	37.4
Surgery & Allied	122	40.4
Paediatrics	27	8.9
Gynaecology	40	13.2
Residency Year		
1st Year	88	29.1
2nd Year	104	34.4
3rd Year	44	14.6
4th and 5th Year	66	21.9
Variable	**Mean**	**SD**
Age (in years)	28.46	3.037



PHEEM: Postgraduate Hospital Educational Environment Measure.

Figure: Categorized Scores of PHEEM and its domains reported by Residents (n=302) (Karachi, 2015).

had above PKR100,000; and 139(56%) had their hometown outside Karachi (Table 2).

PHEEM scores of 82(27%) residents were less than 81; 195(64.6%) perceived their residency more positive than negative with room for improvement; 25(8.6%) had excellent perception about their training; 83(27.8%) had negative perceptions about autonomy;84(27.5%) had negative perceptions about teaching; and 127(42.1%) perceived their workplace to be unpleasant in terms of social support (Figure).

The overall mean score of 93.96±20.79suggested more positive than negative perception with room for improvement. Overall mean PHEEM score was significantly higher for the private hospitals compared to the public hospital (p<0.01). Mean scores of majority of items was greater than 2 except 3 items including having access to document on structured training, being warned inappropriately, and adequacy of catering facilities while on call.

Pertaining to items related to perceptions on autonomy, residents in public hospitals reported significantly higher mean scores for working hours being appropriate (p<0.01), workload being fine (p<0.01)and not being warned inappropriately (p<0.01). On the contrary, private hospitals reported significantly higher scores for having an induction programme (p=0.02), appropriate level of responsibility(p<0.01), clear clinical protocols (p<0.01), opportunity to provide continuity of care (p<0.01), culture of mutual respect (p=0.02) and being ready to be a consultant (p<0.01).

Relating to items on perceptions for teaching, residents in private hospitals reported significantly higher scores for quality of clinical supervision (p<0.01), communication skills (p=0.01), enthusiasm (p<0.01), provision of regular feedback (p<0.01), organisation (p<0.01), accessibility (p<0.01) and encouraging residents to be independent learners (p<0.01). Residents in private hospitals also reported significantly higher mean score on few aspects of social support including less gender discrimination (p<0.01), more collaboration with other doctors (p<0.01), physical safety (p=<0.01) and counselling opportunities for junior doctors (p=0.03) (Table 3).

After adjusting for all important socio-

Table-3: Overall Mean scores of PHEEM, its domains and each item and their comparison between one Public and two Private Hospitals (n=302) (Karachi, 2015).

	Overall (n=302)	Private Hospital (n = 172)	Public Hospitals (n = 130)	p.value[1]
Perception of Role of Autonomy (Total Score 56)	32.83 ± 7.34	33.19 ± 7.63	32.35 ± 6.96	0.323
Had Contract of Employment providing information on hours of work	2.45±1.25	2.30±1.20	2.65±1.28	0.016
Had an informative induction programme	2.43±0.91	2.53±0.83	2.29±1.00	0.023
Had appropriate level of responsibility	2.80±0.95	2.95±0.86	2.60±1.03	0.002
Had to perform inappropriate tasks	2.19±1.12	2.12±1.10	2.28±1.14	0.198
Had access to document on structured training specifying core competencies to be acquired at different levels	1.66±1.16	1.77±1.18	1.52±1.14	0.058
Was warned inappropriately	1.93±0.98	1.78±0.91	2.13±1.05	0.002
Perception on clear clinical protocols	2.31±1.08	2.48±0.98	2.10±1.16	0.003
Perception on working hours being appropriate	2.07±1.14	1.83±1.02	2.38±1.21	<0.001
Had opportunity to provide continuity of care	2.65±0.93	2.83±0.72	2.40±1.10	<0.001
Felt part of the team working in the hospital	2.73±0.90	2.87±0.78	2.54±1.02	0.002
Had opportunities to acquire appropriate practical procedures	2.65±0.92	2.74±0.78	2.53±1.06	0.055
Felt workload was fine in the job	2.03±1.24	1.78±1.16	2.36±1.27	<0.001
Training made the resident feel ready to be a consultant	2.41±1.00	2.56±0.90	2.21±1.09	0.002
Felt Teachers promoted an atmosphere of mutual respect	2.48±1.11	2.60±1.03	2.32±1.18	0.029
Perception of Teaching (Total Score 60)	37.27 ± 9.43	38.49+-9.50	35.67 ± 9.15	0.010
Felt Teachers set clear expectations	2.55±0.91	2.51±0.92	2.59±0.90	0.448
Had protected educational time	2.20±1.04	1.99±0.95	2.47±1.08	<0.001
Had good clinical supervision at all times	2.55±1.01	2.73±0.87	2.30±1.13	<0.001
Felt teachers had good communication skills	2.75±1.02	2.88±0.93	2.59±1.10	0.016
Was able to participate actively in educational events	2.45±1.07	2.48±1.00	2.42±1.16	0.669
Felt teachers are enthusiastic	2.57±1.02	2.75±0.84	2.34±1.18	<0.001
Had access to education programme relevant to needs	2.32±1.07	2.28±1.09	2.36±1.04	0.539
Got regular feedback from seniors	2.38±1.06	2.52±0.97	2.19±1.15	0.009
Felt clinical teachers are well organized	2.52±1.00	2.69±0.96	2.29±1.02	0.001
Had enough clinical learning opportunities relevant to needs	2.51±1.00	2.44±0.96	2.61±1.04	0.142
Felt clinical teachers have good teaching skills	2.81±0.95	2.87±0.79	2.72±1.13	0.182
Felt clinical teachers are accessible	2.57±1.00	2.71±0.92	2.38±1.07	0.005
Senior staff utilized learning opportunities effectively	2.30±1.05	2.40±1.01	2.17±1.08	0.057
Was encouraged by clinical teachers to be an independent learner	2.59±1.00	2.77±0.90	2.35±1.08	<0.001
Teachers provided with good feedback on strengths & weaknesses	2.29±1.13	2.47±1.03	2.05±1.22	0.001
Perception of Social Support (Total Score=44)	23.97 ± 6.76	25.15 ± 6.67	22.41± 6.58	<0.001
Felt there was discrimination on ethnic or religious grounds	2.21±1.14	2.27±1.12	2.12±1.16	0.277
Felt there was sex discrimination	2.49±1.17	2.75±1.00	2.14±1.28	<0.001
Had good collaboration with other doctors	2.98±0.82	3.21±0.56	2.68±1.00	<0.001
Had access to careers advice	2.19±1.16	2.23±1.04	2.14±1.31	0.515
Felt hospital had good quality accommodation when on call	2.07±1.40	2.10±1.28	2.03±1.55	0.677
Felt physically safe within the hospital environment	2.14±1.27	2.63±1.03	1.48±1.48	<0.001
Felt there was no blame culture in the hospital	2.00±1.22	1.96±1.27	2.04±1.17	0.580
Felt there were adequate catering facilities when on call	1.27±1.24	1.12±1.19	1.47±1.30	0.017
Felt clinical teachers had good mentoring skills	2.48±1.08	2.66±0.96	2.25±1.18	0.001
Got a lot of enjoyment from the job	2.06±1.06	2.05±1.04	2.07±1.10	0.855
Felt there were good counseling opportunities for junior doctors	2.07±1.15	2.19±1.13	1.91±1.17	0.034
Overall PHEEM Score	93.96 ± 20.79	96.66 ± 21.88	90.39 ±18.75	0.009

1p-value calculated using Independent T-test.
PHEEM: Postgraduate Hospital Educational Environment Measure.

demographic co-variates, residency in private hospitals showed positive association with PHEEM score (Beta = 6.79; 95% CI 6.35, 7.24;p<0.01) compared to residency in public hospitals. Similarly, PHEEM score was also positively associated with residents who were female and actually belonged to areas outside Karachi (p<0.05%). It was negatively associated with residents whose household monthly income was above PKR 100,000 (p<0.05). While doing residency in paediatric wards showed positive association with PHEEM score, doing

Table-4: Relationship of Socio-demographic and Training related factors with PHEEM Score (n=302) (Karachi, 2015).

	Unadjusted Model				Adjusted Model			
	Beta	**S.E**	**95% CI**	**p-value**	**Beta**	**S.E**	**95% CI**	**p-value**
Type of Hospital								
Public	Reference				Reference			
Private	6.26	0.11	6.03,6.49	<0.01	6.79	0.22	6.35,7.24	<0.01
Gender								
Male	Reference				Reference			
Female	-1.06	0.11	-1.29,-0.84	<0.01	3.27	0.14	2.99,3.55	<0.01
Hometown								
Karachi	Reference				Reference			
Outside Karachi	13.51	0.11	13.28,13.74	<0.01	10.54	0.12	10.31,10.79	<0.01
Household Monthly Income								
Below PKR 100,000/-	Reference				Reference			
PKR 100,000/-& Above	-20.96	0.11	-21.19,-20.73	<0.01	-19.31	0.12	-19.55,-19.07	<0.01
Residency Specialty								
Medicine & Allied	Reference				Reference			
Surgery & Allied	2.2	0.13	1.95,2.46	<0.01	0.24	0.14	-0.03,0.52	0.08
Paediatrics	4.57	0.21	4.16,4.99	<0.01	1.97	0.22	1.53,2.41	<0.01
Gynaecology	3.19	0.09	2.82,3.55	<0.01	-6.79	0.21	-7.21,-6.37	<0.01

Model using Generalized Linear Regression.
PHEEM: Postgraduate Hospital Educational Environment Measure.
OR: Odds ratio.
CI: Confidence intervals.
SE: Standard Error.
PKR: Pakistani Rupee.

residency in gynaecology and obstetrics showed negative association (p<0.05).

Discussion

This is the first multi-centre study with adequate sample size which has used a modified version of PHEEM to assess the education and environment of postgraduate medical training in Pakistan. Globally, PHEEM has been rated as a tool with excellent reliability having Cronbach's alpha ranging from 0.84 to 0.95.[13,16-18] High PHEEM scores have also showed an association with better knowledge and exam performance.[3] The reliability of the PHEEM adapted to local context of Pakistan also showed excellent Cronbach's alpha of 0.917. However, its three-dimensional nature is still a question mark with one study reporting it to be one-dimensional and other two extracting five factors explaining the variation.[13,16,18]

The overall mean score suggested more positive than negative perception with room for improvement (Mean=93.96 ± 20.79). Similar mean scores ranging from 82.64to 102 have been reported from studies in developed and developing countries.[11,13,15,19] Mean scores of majority of items was between 2 and 3, suggestive of environment requiring enhancement and improvement. Low scores were particularly identified for items calling for improvements in standardising the training and ensuring adequate facilities and infrastructure for residents.

More than one-fourth of the residents reporting a score of <81 suggests that there are variations in perceptions of residents from different backgrounds working in different environments. PHEEM score was found to be negatively associated with female residents. However, when adjusted for other co-variates, it turned positive. This may be due to the confounding element of residency in gynaecology and obstetrics which was initially positive, but after adjustment had negative association with PHEEM score. A study in Saudi Arabia, however, found that females were less likely to report better scores.[11] However, the study doesn't provide adjusted association of PHEEM scores with gender and residency department.

Residents with hometown outside Karachi reported better PHEEM scores possibly due to the fact that training environment in urban hospitals presumably is better than peri-urban hospitals. This is contrary to a finding in a study in a developed country like Australia where no significant difference in PHEEM scores was reported in urban and rural settings.[20] In comparison to residents in medicine and surgery, paediatric residents reported better scores while gynaecology and obstetrics residents reported significantly less scores. This explains that there is

variability in perception about training not only between hospitals but also within different disciplines and departments within the hospitals.

Residency in private hospitals also showed positive association with PHEEM score. Significant differences between different types of hospital have also been reported from studies in Saudi Arabia and Japan.[15,21] While generally residents of private hospitals had more positive perceptions on different aspects of autonomy, teaching and social support, residents in public hospitals only reported better score for working hours and workload. A similar study in Pakistan has reported that average working hours in private hospitals are higher compared to public hospitals.[22]

Among different items pertaining to autonomy, the residents of private hospitals reported higher scores for having an effective induction programme, appropriate level of responsibility, clear clinical protocols, opportunity to provide continuity of care and readiness of residents to be a consultant. This is suggestive of the fact that training programmes are more organised in private hospitals from induction to training protocols. Residents in private hospitals also rated teaching related factors highly including quality of clinical supervision, communication skills, enthusiasm, and provision of regular feedback, accessibility and encouraging residents to be independent learners. Greater competency, enthusiasm and teaching skills among non-university hospitals have also been reported in a study from Japan.[15]

Residents in private hospitals also reported significantly higher mean score on few aspects of social support, including less gender discrimination, more collaboration with other doctors, physical safety and counselling opportunities for junior doctors. These findings are indicative of better infrastructure and organisational policies in the private sector.

PHEEM is a strong tool, allowing the stakeholders to reflect the strengths and weaknesses of their residency programme.

Our study has a few limitations. Only one public-sector hospital was compared with two private-sector hospitals due to refusal of permission to collect data by one public-sector hospital. It was not logistically possible to include any other public-sector hospital due to resource constraints. Moreover, this study only provides a picture of a few major training hospitals of Karachi. It is likely that carrying out such an assessment in teaching hospitals of smaller cities may yield different results. Also, PHEEM is a self-reporting tool. This tool may be used to carry out a multi-centre large-scale study also representing smaller cities. The tool may also be modified further to suit the local context in line with CPSP guidelines.[9] The modified tool may then be used for periodic monitoring of postgraduate education environment in all the settings.

Conclusion

Overall, postgraduate environment in three hospitals of Karachi was reported to be satisfactory by residents with room for improvement in all aspects of autonomy, teaching and social support. There is a need to standardise postgraduate training with periodic monitoring to account for the significant variability among different hospitals in terms of training conditions, protocols and infrastructure.

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