

## RESEARCH ARTICLE

## Evaluation of hospital-learning environment for pediatric residency in eastern region of Saudi Arabia

Waleed H. BuAli<sup>1</sup>, Abdul Sattar Khan<sup>2\*</sup>, Mohammad Hussain Al-Qahtani<sup>3</sup>, Shaikha aldossary<sup>1</sup>

<sup>1</sup>Department of Pediatrics, College of Medicine, King Faisal University, AlHsa; <sup>2</sup>Department of Family & Community Medicine, College of Medicine, King Faisal University, AlHsa; <sup>3</sup> Department of Pediatrics, University of Dammam, Dammam, Saudi Arabia

### Abstract

**Purpose:** No study had been conducted to assess the hospitals' environment for learning purposes in multicenter sites in Saudi Arabia. It aims to evaluate the environment of hospitals for learning purposes of pediatric residents. **Methods:** We applied Postgraduate Hospital Educational Environment Measure (PHEEM) to measure the learning environment at six teaching hospitals in the Eastern Region of Saudi Arabia from September to December 2013. **Results:** The number of respondents was 104 (86.7%) out of 120 residents and 37 females and 67 male residents have responded. The residents' response scored 100 out of 160 maximum score in rating of PHEEM that showed overall learning environment is favorable for training. There were some items in the social support domain suggesting improvements. There was no significant difference between male and female residents. There was a difference among the participant teaching hospitals ( $p < 0.05$ ). **Conclusion:** The result pointed an overall positive rating. Individual item scores suggested that their social life during residency could be uninspiring. They have the low satisfactory level and they feel racism, and sexual discrimination. Therefore, there is still a room for improvement.

**Key Words:** *Teaching hospitals; Internship and Residency; Learning; Pediatrics; Saudi Arabia; Social Support*

### INTRODUCTION

Several researchers investigated learning environment at undergraduate level by an inventory called Dundee (DREEM) developed by Sue Roff [1]. This DREEM inventory has been translated in many languages including Arabic and applied for evaluation of learning environment in many countries [2]. This DREEM inventory also applied at postgraduate level in Saudi Arabia for the evaluation of Diploma in Family Medicine by Khan et al. in 2011[3]. There is another reliable and validated inventory to the same purpose, the Postgraduate Hospital Educational Environment Measure (PHEEM) developed by Roff et al [4]. This inventory contains 40 items evaluating various aspects of learning environment in teaching hospitals

for postgraduate training. The inventory measures three domains: perception of teaching; perception of autonomy; and perception of social support. This inventory has been used for four major residency programs: pediatric; surgery; internal medicine and Gynecology & Obstetrics at Taiba University Teaching Hospitals in 2010 [5] and in King Fahad Hospital, Dammam University for all residents in 2011[6]. Though the aims of previous study and ours were the same, the previous studies were conducted at one site only while our study aimed as a multicenter and covered 6 training & teaching hospitals. Therefore it gives a broader picture of learning environment in major teaching hospitals of Eastern region.

### METHODS

#### Setting and subjects

In Eastern Region, there are six teaching hospitals for postgraduate training for 17 specialties [7], including a 4-year train-

\*Corresponding email: [amkhan@kfu.edu.sa](mailto:amkhan@kfu.edu.sa)

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ing pediatric residency program. We included all male and female residents from year 1 to year 4 in our study. The study period was from September to December 2013. A total of 120 residents were invited to participate.

**Instrument**

PHEEM inventory contains 40 items with which the respon-

dents were asked to show their agreement using 5-point Likert scale. These range from strongly agree (4), agree (3), unsure (2), disagree (1) to strongly disagree (0). An environment is considered to be good if it's overall score is high and showing maximum agreement. This inventory has four domains: perception of autonomy; perception of teaching; and social support. There are four negative statements (items 7, 8, 11 and

**Table 1.** Responses of residents on items of Postgraduate Hospital Educational Environment Measure questionnaire

Domains and Items		Mean	SD
<b>Perception about Autonomy</b>			
1	I have a contract of employment that provides information about hours of work	2.27	1.15
4	I had an informative induction program	2.88	0.82
5	I have the appropriate level of responsibility in this post	2.93	0.86
8	<b>I have perform inappropriate tasks</b>	<b>2.48</b>	<b>1.00</b>
9	<b>There is an informative junior doctors handbook</b>	<b>1.63</b>	<b>1.22</b>
11	<b>I am bleeped inappropriately</b>	<b>2.27</b>	<b>1.04</b>
14	There are clear clinical protocols in this post	2.26	1.06
17	My hours conform to the New deal	2.46	0.84
18	I have the opportunity to provide continuity of care	2.87	0.84
29	I feel part of a team working here	2.90	0.93
30	I have opportunities to acquire the appropriate practical procedures for my year of residency	2.89	0.87
32	<b>My workload in this job is fine</b>	<b>1.94</b>	<b>1.28</b>
34	The training in this post makes me feel ready to be a specialist	2.81	0.86
40	My clinical teachers promote an atmosphere of mutual respect	2.37	1.13
<b>Perception about Teaching</b>			
2	My clinical teachers set clear expectations	2.58	0.87
3	I have protected educational time in this post	2.58	1.03
6	I have good clinical supervision at all times	2.60	1.05
10	My clinical teachers have good communication skills	2.55	1.01
12	I am able to participate actively in educational events	3.08	0.85
15	My clinical teachers are enthusiastic	2.42	1.03
21	There is access to an educational program relevant to my needs	2.50	1.12
22	I get regular feedback from seniors	2.61	1.07
23	My clinical teachers are well organized	2.34	1.06
27	I have enough clinical learning opportunities for my needs	2.39	0.99
28	My clinical teachers have good teaching skills	2.65	1.00
31	My clinical teachers are accessible	2.81	0.94
33	Senior staff utilize learning opportunities effectively	2.55	0.90
37	My clinical teachers encourage me to be an independent learner	2.99	0.78
39	The clinical teachers provide me with good feedback on my strengths and weaknesses	2.29	1.14
<b>Perception about social support</b>			
7	<b>There is a racism in this post</b>	<b>2.74</b>	<b>1.16</b>
13	<b>There is sex discrimination in this post</b>	<b>2.65</b>	<b>1.18</b>
16	I have good collaboration with other doctors in my same year	3.23	0.74
19	I have suitability access to careers advice	2.48	1.04
20	This hospital has good quality accommodation for junior doctors, especially when on call	2.15	1.33
24	I feel physically safe within the hospital environment	2.65	1.15
25	<b>There is no-blame culture in this post</b>	<b>1.83</b>	<b>1.20</b>
26	<b>There are adequate catering facilities when I am on call</b>	<b>1.64</b>	<b>1.20</b>
35	My clinical teachers have good mentoring skills	2.37	1.01
36	I get a lot of enjoyment out of my present job	2.34	1.06
38	There are good counseling opportunities for junior doctors who fail to complete their training satisfactorily	2.33	0.91

13) to be scored in reverse order. We included age, gender and residency years (R1 to R4) and name of teaching hospitals with codes for response comparison.

**Procedure**

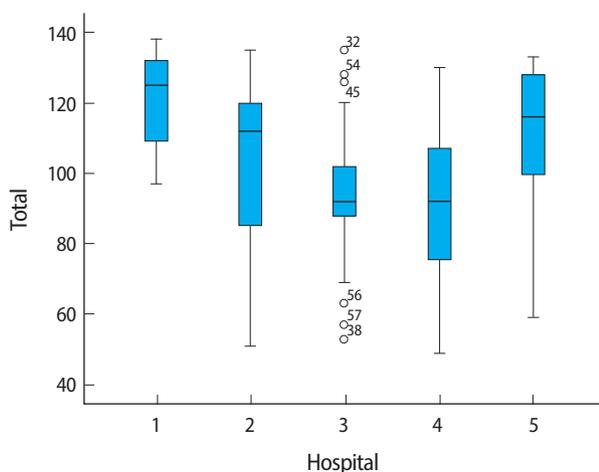
We headed with our plan for taking permission of using PHEEM inventory for our research, after taking permission we applied for ethical approval and received no objection from the ethical committee. All residents of pediatric specialties have collected the data from six teaching and training hospitals of Eastern region. We distributed the questionnaire by hand to make sure that all residents have received the questionnaire. One pediatric specialist has been assigned to collect the entire questionnaire confirming it has been ended face-to-face in order to well-define the doubts promptly if any. And it was asked residents that don't write name or academic number.

**Statistical analysis**

We fed the data into SPSS version 20 (IBM, New York, USA) and did a descriptive analysis and calculate mean and standard deviation of all responses. The difference between males and females' mean scores were calculated and applied t-test for comparison. Then we have calculated median and means and applied ANOVA for comparison of different responses at different teaching hospitals and different years of studies. The p-value less than 0.05 was considered as significant.

**RESULTS**

One hundred and four residents out of 120 have responded

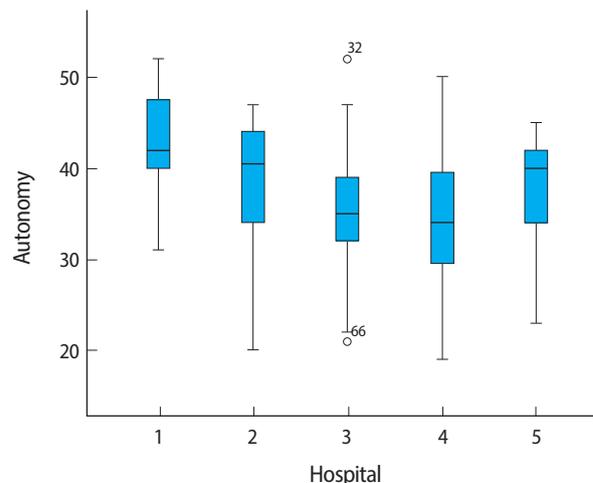


**Fig. 1.** Box plot showing the Max - Q3 - Median - Q1 - Min at six hospitals as regard to all domains of Postgraduate Hospital Educational Environment Measure measured from residents at six teaching hospitals in the Eastern Region of Saudi Arabia from September to December 2013.

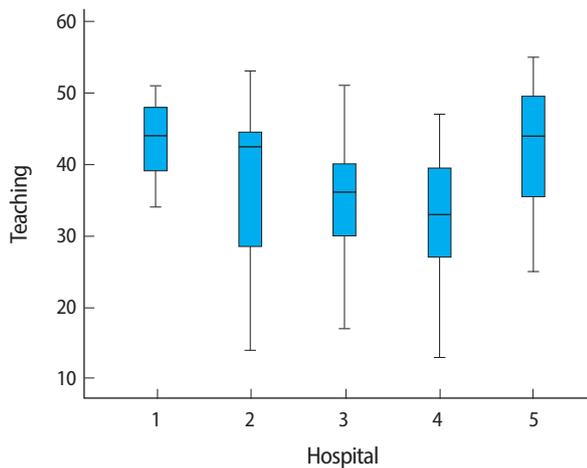
(86.7%) with 37 female and 67 male residents. Forty residents were enrolled in year one, 21 in year two, 19 in year three, and 24 residents in year four. Overall, the residents rated learning environment favorable for training, although there were some items, especially in social support domain, where improvements could be addressed. Except for two responses with higher mean value more than three, none of the responses crossed the mean value above two and there were some items below two showing in bold (Table 1). There are two items (Numbers 8 and 11) in perception about autonomy and two items (Numbers 7 and 13) in perception about social support are “NEGATIVELY” worded question - so an agreement response more than two means that this feature needs to be corrected showing bold and italic in Table 1. The overall results showed  $100.19 \pm 23.13$  (Fig. 1) while autonomy showed  $34.91 \pm 7.83$  (Fig. 2), teaching  $38.89 \pm 9.80$  (Fig. 3), and social support  $26.38 \pm 7.04$  (Fig. 4). Although there was no significant difference between male and female residents (Table 2) and among different years of study (Table 3), there were differences ( $p < 0.05$ ) considering the different teaching hospitals as regards to two domains of teaching and social support system (Table 4).

**DISCUSSION**

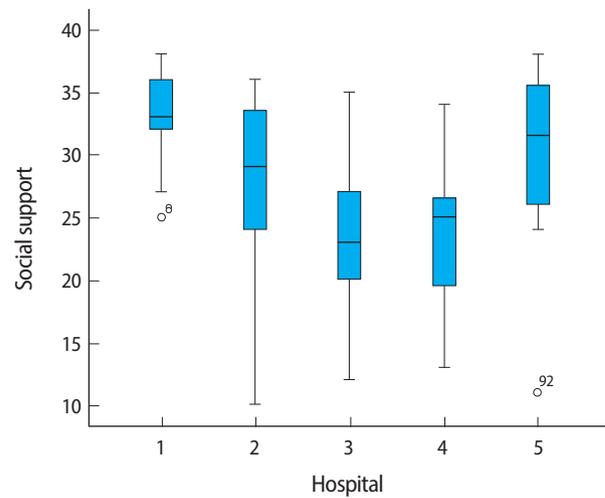
This study used PHEEM as a tool for assessing the learning environment of teaching hospitals for residency programs of pediatric specialty at six sites in Eastern Region of Saudi Arabia. Our study has covered six postgraduate teachings and training centers in Eastern Region while the previous study conducted in one teaching site involved all residents from year 1



**Fig. 2.** Box plot showing the Max - Q3 - Median - Q1 - Min at six hospitals as regard to autonomy domain of Postgraduate Hospital Educational Environment Measure measured from residents at six teaching hospitals in the Eastern Region of Saudi Arabia from September to December 2013.



**Fig. 3.** Box plot showing the Max - Q3 - Median - Q1 – Min at six hospitals as regard to teaching domain of Postgraduate Hospital Educational Environment Measure measured from residents at six teaching hospitals in the Eastern Region of Saudi Arabia from September to December 2013.



**Fig. 4.** Box plot showing the Max - Q3 - Median - Q1 – Min at six hospitals as regard to social domain of Postgraduate Hospital Educational Environment Measure measured from residents at six teaching hospitals in the Eastern Region of Saudi Arabia from September to December 2013.

**Table 2.** Comparison in males and females residents based on domains of Postgraduate Hospital Educational Environment Measure in Saudi Arabia

Domains	Gender	N	Mean	Standard deviation	T-value	P-value
Autonomy	Male	66	35.86	7.75	-1.62	0.107
	Female	36	38.5	7.98		
Teaching	Male	66	35.98	10.75	-1.414	0.160
	Female	36	38.88	8.14		
Social support	Male	66	25.38	6.56	-1.813	0.073
	Female	36	28.00	7.69		
Total score	Male	66	97.23	23.48	-1.711	0.090
	Female	36	105.39	22.16		

**Table 3.** Comparison mean scores given by different years' residents as regard to three domains of Postgraduate Hospital Educational Environment Measure in Saudi Arabia

Domains	R1 <sup>a)</sup> N = 38	R2 N = 21	R3 N = 19	R4 N = 24	ANOVA
Autonomy	37.23 ± 8.09	35.05 ± 8.74	37.89 ± 7.69	35.58 ± 6.92	0.664
Teaching	36.60 ± 9.25	35.38 ± 11.69	39.63 ± 7.47	37.38 ± 10.97	0.580
Social support	26.53 ± 7.22	25.19 ± 7.44	27.05 ± 7.60	26.79 ± 6.20	0.837
Total	100.37 ± 22.99	95.61 ± 26.40	104.58 ± 21.25	101.42 ± 22.00	0.671

R1<sup>a)</sup> = Study years 1, 2, 3, and 4.

**Table 4.** Comparison mean scores given at six hospitals as regard to three domains of Postgraduate Hospital Educational Environment Measure in Saudi Arabia

Domains	T1 <sup>a)</sup> N = 11	T2 N = 20	T4 N = 29	T5 N = 27	T6 N = 16	ANOVA
Autonomy	40.09 ± 6.59	34.90 ± 8.36	32.90 ± 7.60	33.22 ± 8.02	38.19 ± 5.93	0.029
Teaching	46.45 ± 5.83	39.95 ± 11.29	37.38 ± 8.55	34.48 ± 9.48	42.00 ± 9.13	0.004
Social Support	33.09 ± 4.18	27.35 ± 7.71	23.45 ± 5.65	23.59 ± 5.94	30.38 ± 6.84	0.00001
Total	119.64 ± 14.95	102.20 ± 26.36	93.72 ± 19.85	91.30 ± 22.02	110.56 ± 20.31	0.001

T1<sup>a)</sup> = Teaching hospitals 1, 2, 3, and 4.

through year 4 and all major specialties including pediatrics [5]. We mainly focused on only pediatric residents and tried to compare the learning environment among different hospitals for the same specialty in eastern region.

The overall maximum scores showed that there was no major issue present in the environment. The items that depict mean value less than 2 in this study were availability of an informative junior doctors handbook, workload, blame culture, and adequate catering facilities during on call. It means the participants in this study felt these issues are important and making problem for a good learning environment. While other similar study in Saudi Arabia showed that long working hours, unavailability of clinical protocols, inefficient use of training time, lack of constructive feedback, and presence of blaming culture were the major issues. Whereas another comparable study conducted among pediatric residents at Taiba University in Medinah Al-Manwara showed seven items that scored less than 2 mean scores such as: inadequate catering services; perform inappropriate tasks; bleeped inappropriately; suitable access to career advises; informative handbook; informative induction program; and senior staff utilize learning opportunities effectively [5, 6]. The comparison of the results show not much difference in our and above studies. The some of the low item points showed in our and other studies not hard to fix for example to give hands out, having good catering facilities because it is totally management issues, whilst it is difficult to manage the blame culture. The blame culture creates unhealthy environment for learning. And this requires behavior modification and training and need to change the attitude not only students but also all stakeholders, this issue could be embedded to culturally accept the process of feedback that may be considered as blaming, may needs further exploration. Nevertheless it is considered a very important barrier for making conducive environment for learning. Indeed it is a lengthy process to change the behavior but need to start from the identification of the problem and supposed that this study is a start-up point.

Majority items of PHEEM in our study counted as an average and scored around 2 but these results are better than other studies [6, 8-10] where most of the items received responses below 2 mean score. Conversely, a few of the responses have crossed the mean value more than three, which means that the residents were more satisfied with some of areas of the learning environment in all sites of study. These areas include that residents have good collaboration and they were given sufficient time to practice actively in educational events, when compared with other study we found almost similar results. There may be an argument that these results perhaps indicated biased response because these items are directly related to their participation in learning environment. In contrast, the other study

that conducted in Medinah doesn't show the same results but pediatric residents scored high in only one item that is they have the opportunity to provide continuity of care [5]. The overall comparison of the results among published studies indicated that learning environment in eastern region is more conducive, however, may need to have further comparison from other areas of the kingdom to draw any conclusion. The Saudi Commission for Health Specialties may play an important role taking consideration of students' thoughts for future planning for enhancing the learning environment. We analyzed the questionnaire based on three domains [9-11]; therefore, we found that there is a significant difference ( $p < 0.05$ ) present among six teaching hospitals as regard to two domains of teaching and social support domains.

The mean score of their responses near or more than 3 mostly revealed in autonomy domain, while teaching and social support domains demonstrated only a few areas with high mean values. Therefore it seems that residents faced more obstacles in teaching and social domains. Apparently the residency training is often correlated with stress, depression and burnout mainly due to excessive working hours; sleep deprivation, challenging patients and an aggressive and challenging work environment [6, 12, 13]. Though PHEEM did not ask questions that directly addressed these aspects, but scores suggested that their social life during residency could be uninspiring, and their level of social interaction was unsatisfactory. Therefore it is important to highlight weaker items related to social support for improvement in learning environment.

Though this study has many strong points like conducted at six teaching hospitals, high response rate and enough sample size for generalization. Yet it has some limitations too, for example having sample from one region of the Kingdom thus difficult to generalize for the other regions that could be addressed to some extent by comparison of the results with other studies. However it is suggested to conduct the similar study on a large scale and covers as many as possible regions.

In conclusion, the overall learning environment in eastern region is decent still it needs improvement in certain individual areas and domains of teaching and social support.

**ORCID:** Waleed H. BuAli: <http://orcid.org/0000-0002-4210-2908>; Abdul Sattar Khan: <http://orcid.org/0000-0003-4057-8053>; Mohammad Hussain Al-Qahtani: <http://orcid.org/0000-0003-2655-7459>; Shaikha aldossary: <http://orcid.org/0000-0001-7229-5635>

## CONFLICT OF INTEREST

No potential conflict of interest relevant to the study was reported.

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## SUPPLEMENTARY MATERIAL

Audio recording of abstract.

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