

Evaluation of the Clinical learning environment of Tikur Anbessa Specialized Teaching Hospital of Addis Ababa University using the Post Graduate Hospital Health Education's Environment Measure

Damte Shimelis, M.D

Addis Ababa University
School of graduate studies

This is to certify the thesis prepared by Dr Damte Shimelis entitled “Evaluation of the Clinical Learning Environment of Tikur Anbessa Specialized Teaching Hospital of Addis Ababa University using the Post Graduate Hospital Health Education’s Environment Measure”.

Evaluation of the Clinical Learning Environment of Tikur Anbessa Specialized Teaching Hospital of Addis Ababa University using the Post Graduate Hospital Health Education’s Environment Measure is submitted in partial fulfillment of requirements for the degree of masters in Health Sciences education complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

Signed by the examining committee

External examiner: Dr. Cynthia Whitehead Signature date

Internal examiner : Prof. Amha Mekasha Signature date

Adviser: Dr.Tina Martimianakis Signature date

Abstract

Background: The public health system in Ethiopia is the main deliverer of health services and the largest employer of physicians. The public universities are the only available training institutions for post graduate medical education and also have full authority over residents' training. In their training years, residents have dual responsibility as students and responsible physicians. A conflict arises between these two roles as students and workers leading to dissatisfaction among the residents that could affect the quality of the services they deliver during the training or then after and the training outcomes; thus negatively affecting resident learning. Determining the work place conditions that can exacerbate tensions in navigating student and worker roles, can inform reform to improve the resident experience. Assessing the post graduate hospital education environment using the Post Graduate Hospital Education Environment survey tool identifies the weaknesses and strengths of the hospital education environment for rectifying the weaknesses and maintaining the strengths.

Objective: To assess the post graduate clinical education/work environment of Tikur Anbessa Specialized Teaching Hospital of Addis Ababa university using the PHEEM survey tool as seen by residents from the 4 major clinical departments (Internal medicine, Pediatrics, Surgery, Obstetrics and Gynecology) in the three domains of the Post graduate Hospital Educational Environment Measures (PHEEM); perception of role Autonomy, perception of teaching and perception of social support.

Methods: This is a cross sectional study that was conducted from April 1-30, 2016. In this study we used the English version of the PHEEM tool to assess the perception of residents on the health educations learning environment.

Results: Out of 363 residents 218 residents (60.06%) completed the questionnaire. There were 152 males (71.7%), and 60 females (28.3%) . Their age ranges between 20-38 years with a mean age of 26.1. There were 89 residents in year one (42%), 64 residents in year 2 (30.2%), 38 year 3 (17.9%) and 20 were in year 4 (20%) one resident didn't mention year of residency. Twenty-two items were rated as poor with a score of less than 2. The overall score on the three domains of PHEEM was 76.8/160. This indicates plenty of problems of the clinical learning environment. There is statistically significant difference among genders, year of residency and department of residency in the perception of the learning environment ($p < 0.05$, $p = 0.002$, $p < 0.001$) respectively. Male residents and junior residents rated the environment as more positive than females and senior residents respectively. The load of work is heavy in the order Obstetrics and Gynecology, Pediatrics, Internal Medicine and Surgery.

Conclusion and recommendations: For our training program to succeed the program should be designed according to the best standards to ensure satisfaction of residents as well as clients. Improving the quality of duty rooms, more supervision during working hours, reducing the work load, providing junior doctors' handbook etc. will improve the learning environment and facilitate learning. After remedial measures are taken we recommend a regular assessment of the clinical learning environment to determine whether the measures taken are effective.

Key words: hospital, PHEEM, post graduate, resident

Introduction

The public health system in Ethiopia is the main deliverer of health services and the largest employer of physicians. The public universities are the only training institutions for post graduate medical education and also have full authority over residents' training.

In their training years, residents have dual responsibility as students and responsible physicians. A conflict arises between these two roles for residents as they negotiate their responsibilities as students and workers. Previous research documents a perceived conflict between these two roles, with residents reporting dissatisfaction with their training. This form of tension and dissatisfaction could affect their learning outcomes and the quality of the services they deliver during the training or then after (1). There are a number of other sources of dissatisfaction in post graduate medical education. In a focus group discussion conducted among 31 pediatric residents in the Department of Pediatrics and Child Health, Tikur Anbessa Hospital and 17 residents in the Department of Ophthalmology, Menelik II Hospital in Addis Ababa responded that the post graduate learning environment is not conducive (unpublished report).

The clinical learning environment is a complex, multidimensional entity in a complex social system. Identification of factors of the social climate that characterize a clinical learning environment could lead to strategies that foster those factors most predictive of student learning outcomes.

In the real world, medical services are delivered by a team of doctors, nurses, other health care professionals and managers but little attention is given in developing team work for patient care. This is a challenge for health care providing institutions and trainees. The relative devaluing of clinical research and lack of funding but on the other hand increased demands for good quality teaching has placed a big stress on the staff in the medical schools (2).

The current population of Ethiopia is 96, 633, 46 according to the Ethiopia Demographics Profile and the physician population ratio is 0.03 physicians/1000 population (3). With the population explosion in Ethiopia, an increased demand for qualified health professionals has ensued, including expectations that the physician population ratio is also increased. This is a challenge for existing training institutions. A study done exploring the profile of medical doctors in Ethiopia, showed a high annual attrition rate of physicians (4). The article documented a fast population growth, an expansion of governmental and nongovernmental health institutions and an increased postgraduate enrollment (4). In this study the author recommended to apply concrete medical doctors' retention mechanisms before the public medical schools and hospitals before the physician pool dries up (4).

An environment that is not conducive for trainees, heavy work load, low salary, obstructive administration, lack of residential areas makes the postgraduate training unattractive and affects learning outcomes (5-8).

Measuring clinical learning environment is crucial for the quality improvement of medical education in Ethiopia and has become an important approach for evaluating the quality of the medical curriculum and training programs (9-12). Measuring clinical learning environment also evaluates strengths, weaknesses and indicates priority areas for improvement.

Based on the psychosocial educational conceptual framework various instruments have been developed to study the clinical learning environment. One of the tools is the clinical learning environment inventory (CLEI) to assess nursing students' perceptions of the clinical learning environment (12). The other is Postgraduate Hospital Educational Environment Measure (PHEEM); a 40 item questionnaire that was initially developed by Roff S. et al. to evaluate the various aspects of the learning environment focusing on the perceptions of autonomy, perceptions of teaching and perceptions of social support. This tool was validated in various studies and found to be consistent (13-15). It assesses the quality of the educational environment and determines areas which require improvement.

The objective of this study is to assess the post graduate hospital educational environment of Tikur Anbessa Specialized Teaching Hospital of Addis Ababa, University using the PHEEM tool. We investigate the association of the teaching environment with gender, year of residency (R1-R4) and department (Pediatrics, Obstetrics and Gynecology, Internal Medicine and Surgery).

Methodology

This is a cross-sectional study which was conducted in Tikur Anbessa Specialized Teaching Hospital of Addis Ababa. A pilot study was conducted in 18 medical education students before the questionnaire was distributed to study subjects but significant changes were not made on the questionnaire. The English version of the Postgraduate Hospital Educational Medical Environment measure (PHEEM) questionnaire was distributed to rotating residents in the 4 major clinical departments. Each of the items in the PHEEM questionnaire were scored in a 5-point Likert Scale from 0-4 (strongly disagree (SD) 0, disagree (D) 1, Uncertain (U) 2, agree (A) 3, and strongly agree (SA) 4). Four of the 40 items (numbers 7, 8, 11 and 13) are negative items and were scored: 0 for SA, 1 for A, 2 for U, 3 for D, and 4 for SD (20). Means were calculated. The effects of training stage R1-R4 and gender (male versus female) on the PHEEM scores were estimated and construct validity was measured using exploratory factor analysis.

Data was cleaned and analyzed using SPSS version 21 software. Descriptive statistics was reported as mean, median and standard deviation. The comparative statistics applied was the nonparametric methods of Mann–Whitney U for two independent samples between females and males and Kruskal-Wallis for multiple independent samples (19) to measure the statistical significance between different residency programs R1 (first year in residency training) through R4 (fourth year in residency training). Global mean scores, for individual respondents were calculated.

Results

Two hundred eighteen residents responded out of a total of 363 in the four major clinical departments with a response rate of 60.06%. Six questionnaires were incompletely filled and were discarded. Table 1 shows the response rate from each department. There were 152 males (71.7%), and 60 females (28.3%). Their age ranges between 20-38 years with a mean age of 26.1 There were 89 year one residents (42%), 64 year 2 (30.2%), 38 year 3 (17.9%) and 20 were year 4 (20%) one resident didn't mention year of residency. Mean and standard deviation for the three domains and for the total is computed as shown in table 2. Twenty two items were rated as poor with a score of less than 2 (table 3) but two items (item number 2 and 4) were rated highly >3 but this has a negative impression of the environment.

Table 4 shows the cumulative scoring of the four major clinical departments and interpretation of the results according to the suggestion given by Roff et al.

When the nonparametric test was applied for differences according to Mann Whitney U ranks, there are significant differences between female and male residents regarding the variables inappropriate

compensation for job, enjoyment out of one's present job, there is ethnic discrimination on assignment area, I like the current work environment and atmosphere ($p < 0.05$), where male residents obtained higher scores than females. Males suggest inappropriate compensation for their job; enjoy their job when compared with females, males are more ethnically discriminated than females despite these issues, males like the current work environment than females.

When year of residency (R1-R4) is compared regarding the educational environment in the departments of Pediatrics, Internal medicine, Surgery and Obstetrics according to the Kruskals-wallis Test there is a statistically significant difference between year of residency on the variable 'I don't receive appropriate compensation from my job' ($p = 0.0024$) with a mean rank of 89.60 for first year, 111.63 for second year, 121.89 for third year and 124.70 for fourth year). There is also significant difference between Year of Residency on the variable this hospital has good quality duty rooms for junior doctors when on duty ($p = 0.000$) with a mean rank of 123.44 for first year, 91.84 for second year, 90.47 for third year and 98.82 for fourth year). Residents in the first year perceived the environment better than their senior residents.

There is a statistically significant difference between department of residency on 'my job takes a lot of my energy and physical strength' ($p = 0.00$), with a mean rank of 128.21 for pediatrics, 126.87 for Obs-Gyn, 92.50 for Surgery and 89.87 for Internal medicine); regarding the load of work while on duty there is a statistically significant difference between departments ($p=0.000$) in the order of Obs/Gyn, Pediatrics, Internal Medicine and Surgery. Regarding senior residents taking initiative to care about clinical work there is a statistically significant difference between departments ($p=0.000$) in the order of Pediatrics, Obstetrics, Surgery and internal medicine.

Discussion

Our overall score is 76.83 and according to Roff S et al. (15) this score indicates plenty of problems with the clinical teaching environment that necessitate major changes. Items with a mean score of 2-3 identify elements of the clinical environment that could be enhanced. It is interesting and disappointing also that the score for 21 items is less than 2. These items should be examined very closely because these indicate problem areas. Several centers have used this tool to assess the hospital training environment and it is found to be a reliable tool that un masks the strengths and weaknesses of the teaching hospital environment (16, 17). A similar study done in Pakistan has shown that the teaching hospital environment is poor (18) but another study is Saudi Arabia has shown a "more positive than negative" teaching environment but with room for improvement (19). A multi-center cross sectional study done in Greece to assess the prevalence of burnout in Greece clinical residents has shown that training dissatisfaction and burnout are common in Greek residents and systemic interventions were recommended (20). Another study done in Spain also showed a negative impression of the residency program. (1)

Male residents ranked the teaching environment higher than female residents which is statistically significant ($p < 0.05$). This is similar to the study done in Dammam University, Kingdom of Saudi Arabia (14). This could be because of physiological differences between genders and cultural maltreatment of females in this part of the globe.

Junior residents in our study perceived the clinical learning environment better than the senior trainees which is similar to the study done in UK (16). This could be because of longer years of experience; but the study done in Saudi Arabia didn't show significant difference (14).

Though this study was done in the same clinical environment in the 4 major clinical departments, there is a difference in the perception of the clinical learning environment. There was a perception of plenty of

problems in the overall score in all the three domains in Internal Medicine followed by Surgery but More positive than negative but room for improvement in Pediatrics followed by Obstetrics and Gynecology.

The finding of an overall score of 76.8/160 in this study means plenty of problems in the clinical learning environment. Lack of quality duty rooms, presence of gender discrimination, lack of junior doctor's handbook for reference, lack of clinical protocols which guide in the practice area, lack of supervision during practice, no constructive feedback from seniors, exhaustive working hours, lack of social support in general made the clinical learning environment an unpleasant place for training. This calls for faculty development. Faculty development "is not just about "teaching the teachers to teach". It should be an institution-wide pursuit with the intent of professionalizing the educational activities of clinical teachers, enhancing educational infrastructure, and building educational capacity for the future—in other words, establishing education and training at the centre of what clinician trainers, and trainees, do."(21)

Conclusion and recommendation

For our training program to succeed the training program should be designed according to the best standards to ensure satisfaction of residents as well as clients. After remedial measures are taken we recommend a regular assessment of the clinical learning environment to determine whether the measures taken are effective. We would also like to recommend for further large scale study to be conducted.

Limitations of the study

Although the response rates to the survey was reasonably good (60.08%) to generalize our conclusions, the study should include all clinical departments in the hospital. It is difficult to determine whether no response means a negative attitude towards the clinical learning environment or other circumstances.

Acknowledgement: I would like to thank my advisor Dr.Tina Martimianakis for her invaluable advice and Prof. Brian Hodges my mentor and educator for his invaluable investment of his time, energy, money and many things for the accomplishment of the medical education program. I would like also to extend my word of thanks to Ato Amare Wusbshet for doing the statistical analysis. Many thanks to our residents for their willingness to share their impressions of the clinical learning environment.

References

1. L. Biedma-Velazquez, R. Serrano-Del-Rosal, J.M.Garcia-De-Diego, J. A. Cerrillo-Vidal. Dissatisfaction with residency: A discrepancy between preferences and expectations? *Medical teacher*:2012; e1-e7
2. M.Severs, S.Crane. Challenges in medical education- what the doctor ordered? *Postgrad Med J* 2000;76:599–601
3. WWW. Indexamundi.com .Ethiopian Demographics Profile 2014
4. Berhan Y. Medical doctors profile in Ethiopia: production, attrition, and retention: in memory of 100-years Ethiopian Modern Medicine and the new Ethiopian Millennium. *Ethiop Med J.* 2008 Jan; 46 suppl:1-77
5. Eraut M. Learning from other people in the workplace. *Oxford Review of Education.* 2007; 33(4):403-22.
6. Myers KK, Sadaghiani K. Millennials in the Workplace: A Communication Perspective on Millennia’s Organizational Relationships and Performance. *J Bus Psychol.* 2010 Jun; 25(2):225-38.
7. Sinai J, Tiberius R, de Groot J, Brunet A, Voore P. Developing a training program to improve supervisor-resident relationships, step 1: defining the types of issues. *Teaching and Learning in Medicine.* 2001; 13(2):80-5.
8. Kilminster S, Cottrell D, Grant J, Jolly B. AMEE Guide No. 27: Effective educational and clinical supervision. *Med Teach.* 2007 Feb; 29(1):2-19.
9. Soemantri D, Herrera C, Rquelme A: Measuring the educational environment in health professions studies; Systematic review. *Med Teach* 2010, 32(2):947-52
10. Isba R, Boor K: Creating a learning environment. *Medical education: theory and practice.* Edited by Tim D, Karen M, Alber S. Great Britain: Churchill Livingstone;2011
11. Tsai J-C, Chen C-S, Sun I-F, Liu K-M, Lai C-S. Clinical learning environment measurement for medical trainees at transitions: relations with socio-cultural factors and mental distress.*BMC Medical Education* 2014, 14: 226
12. C.Dominic. *Journal of Nursing Education* 2002, 41(2):69-75
13. Al-Sheikh M.H., Ismail M. H., Al-Khater S.A. Validation of the postgraduate hospital educational environment measure at a Saudi university medical school. *Saudi Med J* 2014; 35 (7):734-38.
14. Al-Marshad S., Alotaibi G., Evaluation of clinical educational environment at King Fahad Hospital of Dammam University using the postgraduate Hospital Education Environment Measure (PHEEM) inventory. *Education in Medicine Journal*, 2011, 3(2):e6-e14.
15. Roff S, McAleer S, Skinner A. Development and validation of an instrument to measure the postgraduate clinical learning and teaching educational environment for hospital-based junior doctors in the UK. *Medical Teacher* 2005, 27 (4): 326-31.
16. Clapham M, Wall D, Batchelor A. Educational environment in intensive care medicine—use of Postgraduate Hospital Educational Environment Measure (PHEEM). *Med Teach* 2007; 29:e184-e191.
17. Aspegren K, Bastholt L, Basted KM, Bonnesen T, Ejlersen E, Fog I, et al. Validation of the PHEEM instrument in a Danish hospital setting. *Med Teach* 2007; 29:498-500.
18. Biggs JSG. Postgraduate medical training in Pakistan: observations and recommendations. *J Coll Physicians Surg Pak* 2008; 18(1):58-63.
19. Al-Sheikh M H.,Ismail M H.,Al-Khater S A. Validation of the postgraduate hospital educational environment measure at a Saudi university medical school. *Saudi Med J* 2014; Vol. 35 (7): 734-38

20. Msaouel P, Keramaris NC, Tasoulis A, Kolokythas D, Syrmos N, Pararas N, Thireos E, Lionis C. Burnout and training satisfaction of medical residents in Greece: will the European Work Time Directive make a difference? *Human Resources for Health* 2010, 8:16; 1-11
21. T Swanwick. See one, do one, then what? Faculty development in postgraduate medical education. <http://journals.bmj.com/cgi/reprintform>.

Table 1: Response rate of clinical residents in the four major clinical departments (Internal Medicine, Surgery, Obstetrics and Gynecology, Pediatrics) of Tikur Anbessa Specialized Teaching Hospital, Addis Ababa, Ethiopia

Department	Participant (n)	Total (N)	Response rate (%)
Pediatrics	42	60	70
Obstetrics and Gynecology	49	85	57.6
Surgery	70	120	58.3
Internal medicine	57	95	60
Total	218	363	60.06

Table 2: Summary of the Post Graduate Hospital Educational Environment Measure questionnaire score for the departments of Internal Medicine, Pediatrics, Surgery and Obstetrics and Gynecology of Tikur Anbessa Specialized Teaching Hospital, Addis Ababa, Ethiopia

Perception of role autonomy		Mean	SD
1	My workload is more than I can handle	2.58	1.246
4	I do not receive appropriate compensation from my job	3.35	.920
5	I have the appropriate level of responsibility in my assignment	2.54	1.208
8	I am afraid of being taken to court	2.50	1.146
9	I am provided with a junior doctor's handbook for reference	1.00	1.140
11	When patients or their family know that I am a new physician, they do not trust the medical treatment I provide	1.70	1.128
14	There are clear clinical protocols which guide me in my practice	1.22	1.201
17	Nursing staff members help me with my clinical work	2.01	1.251
18	During my clinical learning hours, I have good supervision and protection	1.62	1.118
29	I feel part of a team working here:	2.63	1.109
30	I have opportunities to acquire the appropriate practical procedures at my level	2.11	1.243
32	The workload in my practice is acceptable	1.83	1.208
34	I regularly receive feedback from senior medical staff that helps me review and improve my clinical practices	1.77	1.276
40	My clinical teachers promote an atmosphere of mutual respect	1.67	1.278
Cumulative score of the above items out of 56 (mean)		28.53	
Perception of Teaching		Mean	SD
2	My job takes a lot of my energy and physical strength	3.17	.954
3	When I am on call I am unable to get enough sleep	2.76	1.156
6	I have good clinical supervision at all time	1.75	1.146
10	My clinical teachers have good communication skills	2.27	1.248
12	I am able to participate actively in educational events	2.55	1.050
15	All of my clinical teachers have good teaching skills	2.26	1.153
21	My clinical teachers effectively utilize clinical cases when teaching me	2.16	1.097
22	I get regular constructive feedback from seniors	1.58	1.122
23	I like the current work environment and atmosphere	1.59	1.171
27	I am stressed when dealing with patients who present with problems outside my specialty when I am on duty	2.10	1.106
28	My clinical teachers set up clear learning objectives for me	1.52	1.158
31	My clinical teachers are accessible	1.91	1.144
33	Senior residents take the initiative to care about my clinical work	2.54	1.050
37	I feel that my clinical teachers are approachable	1.82	1.183
39	The clinical teacher provides me with good feedback on my strengths and weaknesses	1.59	1.134
Cumulative score of the above items out of 60 (mean)		31.57	
Perception of social support		Mean	SD
7	There is ethnic discrimination in my assignment area	.79	.935
13	There is gender discrimination in my assignment area	.95	1.077
16	I have a heavy workload when I am on duty	2.79	1.127
19	My clinical teachers are enthusiastic about teaching	1.88	1.097
20	This hospital has good quality duty rooms for junior doctors, when on duty	.60	1.048
24	I feel physically safe in the hospital environment	1.37	1.283
25	I have no problem with non-physician medical staff members	2.31	1.264
26	Other non-physician medical staff members do not trust my clinical decisions because I am a new physician	1.40	1.020
35	I have enough opportunity to learn the knowledge and skills I need to practice medicine	2.07	1.216
36	I get a lot of enjoyment out of my present job	1.51	1.292
38	There are good counseling opportunities for junior doctors who fail to complete their training satisfactorily	1.05	1.61
Cumulative score of the above items out of 44 (mean)		16.73	
Overall score out of 160 (mean)		76.83	

Table 3: Summary of the items with mean score below 2 from the four major clinical departments in ascending order, Tikur Anbessa Specialized Teaching Hospital, Addis Ababa, Ethiopia

	Item	Mean	SD
20	This hospital has good quality duty rooms for junior doctors, when on duty	0.60	1.048
7	There is ethnic discrimination in my assignment area	0.79	0.935
13	There is gender discrimination in my assignment area	0.95	1.077
9	I am provided with a junior doctor's handbook for reference	1.00	1.140
38	There are good counseling opportunities for junior doctors who fail to complete their training satisfactorily	1.05	1.61
14	There are clear clinical protocols which guide me in my practice	1.22	1.201
24	I feel physically safe in the hospital environment	1.37	1.283
26	Other non-physician medical staff members do not trust my clinical decisions because I am a new physician	1.40	1.020
36	I get a lot of enjoyment out of my present job	1.51	1.292
28	My clinical teachers set up clear learning objectives for me	1.52	1.158
22	I get regular constructive feedback from seniors	1.58	1.122
23	I like the current work environment and atmosphere	1.59	1.171
39	The clinical teacher provides me with good feedback on my strengths and weaknesses	1.59	1.134
18	During my clinical learning hours, I have good supervision and protection	1.62	1.118
40	My clinical teachers promote an atmosphere of mutual respect	1.67	1.278
11	When patients or their family know that I am a new physician, they do not trust the medical treatment I provide	1.70	1.128
6	I have good clinical supervision at all time	1.75	1.146
34	I regularly receive feedback from senior medical staff that helps me review and improve my clinical practices	1.77	1.276
37	I feel that my clinical teachers are approachable	1.82	1.183
32	The workload in my practice is acceptable	1.83	1.208
19	My clinical teachers are enthusiastic about teaching	1.88	1.097
31	My clinical teachers are accessible	1.91	1.144

Table 4: Summary of the cumulative means of the three domains of PHEEM for the four major clinical departments, Tikur Anbessa Specialized Teaching Hospital, Addis Ababa, Ethiopia

Grading for the 3 domains		Surgery	Obs/Gy	Pediatrics	Internal medicine
Perception of role autonomy					
0-14	Very poor				
15-28	A negative view of one's role	27.14	30.55	30.88	26.77
29-42	A more positive perception of one's job				
43-56	Excellent perception of one's job				
Perception of teaching					
0-15	Very poor quality				
16-30	In need of some retraining	29.46	34.2	33.5	27.33
31-45	Moving in the right direction				
46-60	Model teachers				
Perception of social support					
0-11	Non existent				
12-22	Not a pleasant place	16.08	18.58	17.1	15.64
23-33	More pros than cons				
34-44	A good supportive environment				
Overall score					
0-40	Very poor				
41-80	Plenty of problems	72.68	81.47	81.48	69.74
81-120	More positive than negative but room for improvement				
121-160	Excellent				