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# Comparative evaluation of two cohorts of final year residents on perception of curricular improvements after the Bologna Declaration at Yerevan State Medical University

Lilit Khachatryan

## ABSTRACT

**Objective:** To assess the difference in evaluation between final year residents of 2008 and 2010 cohorts at a state-run medical school in Armenia after implementing a new curriculum in postgraduate physician education and training according to the Bologna Declaration we conducted a pilot survey. **Methods:** One hundred and ninety-nine trainees were surveyed on their perception of residency program components via a self-employed structured questionnaire. **Findings:** Analysis of survey data revealed statistically significant differences ( $P < 0.05$ ) in residents perceptions on supervisors motivation ( $P = 0.002$ ) and fair grading ( $P = 0.005$ ); use of group work ( $P = 0.017$ ), role play ( $P = 0.049$ ) and case discussion ( $P = 0.010$ ) as interactive teaching methods; evaluation of training site equipment ( $P = 0.021$ ); participation in problem-based learning ( $P = 0.017$ ) and conferences ( $P = 0.008$ ). Resident's evaluation of oral exams as the best method for knowledge assessment ( $P = 0.030$ ) and in department rotation system is different ( $P = 0.027$ ). **Conclusion:** In this survey, most differences in evaluation may be explained by introduction of improved training methods and curricula, introduction of individual supervisor system and more opportunities for interactive teaching methods. Current findings may serve a basis for countries facing challenges in post-graduate medical education system regionally and internationally under the Bologna process and for further improvement in residency program planning locally.

**KEY WORDS:** Continuing medical education, curricular reforms, evaluation

Department of  
Postgraduate and  
Continuing Medical  
Education, Yerevan  
State Medical University,  
Yerevan, Armenia

**Address for correspondence:**

Lilit Khachatryan,  
Yerevan State Medical  
University, 2 Koryun Street,  
Yerevan 0025, Armenia.  
Phone: 0037491-328651.  
E-mail: lilit\_khachatryan09@  
alumni.uaa.com

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## INTRODUCTION

The role of continuous reforms and improvements, use of more advanced methodology and curricula in medical education and further evaluation are important. Yerevan State Medical University (YSMU, www.ysmu.am) is the only state institution in Armenia that offers undergraduate and post-graduate medical education predominantly for local population as well as students from Commonwealth of Independent States, Asian and South-African region. After the collapse of Soviet Union in 1991 provision of medical education by YSMU underwent numerous reforms to meet international standards and get accreditation. Particularly, in 2004 Armenia joined the Bologna declaration [1] making the most crucial step toward the reforms. The Bologna declaration is a key document for development of European higher education “specifying common framework of comparable degrees, introduction of undergraduate and post-graduate levels in all countries, compatible credit systems, quality assurance and elimination of obstacles to the free mobility” throughout

Europe [1]. This European directive ensures comparability, transferability and integration of education systems and curricula through quality assurance, mobility and unified crediting system within European Union (EU) countries. Joining the Bologna declaration requires periodic evaluation of reforms and improvements to get better understanding of what works in a specified educational area.

Medical education also should be part of the Bologna process [2]. Use of learning outcomes framework agreed at European level reinforces the medical education in the undergraduate and post-graduate cycles requiring integrated teaching, learning and assessment at every stage [3]. However, generally greater emphasis is put on the undergraduate component, while post-graduate medical education still remains an underdeveloped area and raises particular interest. There are no unique guidelines for European and regional medical universities on how to improve post-graduate provision of medical knowledge and practice. Each country is free to choose the type of reforms and

curricular changes to meet the Bologna principles. Specifically, only a few EU countries do apply the Bologna declaration to post-graduate/residency programs (e.g., Switzerland) [4]. Despite the precedents, only a few countries do not face growing challenges of the Bologna process because of diverse context and conditions, differences in health care delivery systems and workforce, problems of criteria or standards in evaluation and accreditation and social responsibility and relevance to medical education [5]. Lack of clarity and confusion about implications of the Bologna process for medical education often leads to failure of desired curriculum development [6]. However, the example of several countries [4-6] proves that Bologna is achievable also for medical post-graduate education.

Armenia was the first post-Soviet country in the Eurasian region to enforce reforms in post-graduate medical education/residency programs. Guided by the specific standards for medical education [7], recently, a number of reforms took place in the context of post-graduate education at YSMU. Specifically, assignment of individual supervisors (with overall responsibility to oversight typically from one to four resident's performance and professional growth; usually skillful and experienced professors and assistant professors with extensive professional and teaching background are assigned in the role of an individual supervisor), new teaching methods (with more emphasis on interactive teaching including role plays, group work, journal clubs, discussions/disputes and clinical case presentations), in-department and in-hospital rotations and knowledge assessment schemes were introduced into the residency curricula. However, these changes affected mostly those residents who graduated after 2008. To identify whether the activities thought to take place actually do and assess the possible benefits of these improvements, we outlined a research survey in accordance with international practice and procedures [8-11]. The survey enabled us to compile and analyze the intended versus actual learning/clinical activities ensuring that residents receive the experiences they should be getting and in sufficient quantity and quality [9].

To measure and evaluate the possible differences between resident's perceptions about curricular and methodological improvements after application of reforms in residency programs we conducted a survey to investigate how different the final year physicians in training of cohorts of 2008 and 2010 perceive and evaluate the changes.

## METHODS

### Study Design

The study employed a cross-sectional, descriptive design, comparing those physician trainees who would be affected by the Bologna reforms with those who would not by virtue of year in traineeship. To be eligible local and international residents were on their final year of studies at residency on enrollment (2008 and 2010), passed exams and agreed to participate. Residents were excluded if they had cancelled or postponed their exams and had only one mark for all items on the questionnaire.

## Study Variables, Instrument and Sample Size

The study variables included gender, medical specialty, government-provided subsidy for learning, curricular, pedagogical and methodological indicators of evaluation, assessment of research opportunities and in-department rotations, and self-assessment of knowledge and skills. We designed a survey instrument by adapting questions from instruments used in previous studies in Armenia and Norway (American University of Armenia student evaluation form [12]; Accreditation Council for Graduate Medical Education resident/fellow Survey [13]; and YSMU questionnaire for Family Medicine Department). The survey instrument was in Armenian (for local residents) and Russian and English (for foreigners). A total of 39 items were closed-ended questions using Likert-type scaling and two items were open-ended questions that elicited comments and recommendations. The instrument was piloted with five residents and no further changes were made. Sample size initially included 262 residents in total (189 residents graduated in 2010 and 73 residents graduated in 2008) with 79.0% response rate.

## Data Collection, Management and Analysis

Surveys were administered within the period from February to July, 2010. We obtained the complete list of eligible 262 residents of the final year residents graduating in 2008 and 2010 respectively who completed structured questionnaires. We entered completed questionnaires into Statistical Package for the Social Sciences (SPSS) 11.0 for windows. Frequency analyses and Pearson's Chi-square were used to analyze the data within SPSS 11.0. We set the level of significance as 0.05. Descriptive analyses and comparison between two sets of variables (for years of 2008 and 2010) were conducted. Due to the vast majority of scales with zero mark for the categories absolutely agree and absolutely disagree, these categories were combined with agree and disagree.

## Protection of Participants

The pilot study project was approved by the YSMU Institutional Review Board. Anonymity and confidentiality were achieved by assigning identification numbers to participants.

## FINDINGS

Two hundred and seven trainees completed the survey for a response rate of 79.0%. Refusal rate was 0.8% (two trainees). Eight (3.1%) questionnaires were excluded for incomplete response. Thus, the final number of participants was 199 counting for response rates of 76.0% and 97.0% in respect to the initial sample size and actually participated sample, respectively.

One hundred and twenty-six graduated in 2010 (63.3%) and 73 graduated in 2008 (36.7%) residents completed the survey. Men and women were equally represented accounting for 43.7% (87) and 43.2% (86) respectively (about 13% did not mention their gender). Government subsidy for education was granted to 36.7% (73) of participants. Among the residents

32.7% (65) and 29.6% (59) belonged to surgery (abdominal, thoracic, otorhinolaryngology, ophthalmologic, neurosurgery and traumatology) and therapeutic specialties (cardiology, pulmonology, gastroenterology, hematology, nephrology, immunology, rheumatology) as general field of study, while 19.0% (38) and 7.0% (14) reported dentistry and obstetrics-gynecology respectively [Table 1].

We observed statistically significant differences ( $P < 0.05$ ) between the final year residents of 2008 and 2010 in a variety of variables such as: in evaluation of individual supervisors, assessment of course and department indicators, participation in problem-based learning and conferences; and knowledge assessment mode.

Final year residents of 2008 differently evaluated their supervisors compared to graduating residents of 2010. Particularly, fewer trainees of 2010 were motivated to do the best (91.4% vs. 95.9%,  $P = 0.002$ ) by individually assigned supervisors. Similarly, graduated in 2010 resident's perception on fair grading was lower than those for final year trainees of 2008 (81.0% vs. 83.5%,  $P = 0.005$ ). Similarly, residents of 2010 and 2008 cohorts evaluated didactic courses differently in terms of interactive teaching methods, such as group work (70.2% vs. 61.7%,  $P = 0.017$ ), case discussion (87.3% vs. 78.1%,  $P = 0.010$ ), and role-play (43.6% vs. 23.3%,  $P = 0.049$ ). Residents graduated in 2010 and 2008 differently evaluate training site equipment (62.7% vs. 85.0%,  $P = 0.021$ ). More interestingly, residents report different participation in problem-based learning and scientific conferences (53.2% vs. 31.5%,  $P = 0.017$  and 88.1% vs. 80.8%,  $P = 0.008$  respectively). Moreover, only 87.7% of graduated in 2008 residents agree that oral exams are the best method of knowledge checkup versus 91.2% of final year residents of 2010 ( $P = 0.030$ ). Similarly, 54.8% of graduated in 2008 residents report agreement that rotations within department stimulate learning versus 70.4% of the final year residents of 2010 ( $P = 0.027$ ) [Table 2].

**Table 1: Descriptive characteristics of the study participants**

Variables	Residents of 2010 cohort, n=126 (%)	Residents of 2008 cohort, n=73 (%)	Combined n=199 (%)	$\chi^2$ (df)	P value
Gender					
Male	58 (46.0)	29 (39.7)	87 (43.7)	0.8 (2)	0.674
Female	51 (40.5)	35 (47.9)	86 (43.2)		
Missing	17 (13.5)	9 (12.3)	26 (13.1)		
Government subsidy					
Yes	51 (40.5)	22 (30.1)	73 (36.7)	5.5 (2)	0.065
No	60 (47.6)	37 (50.7)	97 (48.7)		
Missing	15 (11.9)	14 (19.2)	29 (14.6)		
General field of study					
Therapy	44 (34.9)	15 (20.5)	59 (29.6)	9.1 (6)	0.167
Surgery	36 (28.6)	29 (39.7)	65 (32.7)		
Ob/gyn	8 (6.3)	6 (8.2)	14 (7.0)		
Diagnostics	9 (7.1)	5 (6.8)	14 (7.0)		
Dentistry	26 (20.6)	12 (16.4)	38 (19.0)		
Other	3 (2.4)	5 (6.9)	8 (4.0)		

Data are presented as frequencies and percentages unless specified. n: Number, df: Degrees of freedom

**Table 2: Comparison of final year residents of 2008 and 2010 cohorts by each variable**

Variables	Residents of 2010 cohort n=126 (%)	Residents of 2008 cohort n=73 (%)	$\chi^2$ (df)	P value
Supervisor				
Has good command of the subject				
Disagree	1 (0.8)	0	2.6 (5)	0.757
Neither disagree nor agree	1 (0.8)	1 (1.4)		
Agree	122 (96.9)	70 (95.8)		
Don't know	2 (1.6)	1 (1.4)		
Teaches theoretical knowledge				
Disagree	1 (0.8)	3 (4.1)	6.2 (6)	0.400
Neither disagree nor agree	4 (3.2)	4 (5.5)		
Agree	118 (93.6)	65 (89.1)		
Don't know	2 (1.6)	1 (1.4)		
Teaches practical skills				
Disagree	4 (3.2)	4 (5.4)	7.0 (6)	0.317
Neither disagree nor agree	8 (6.3)	10 (13.7)		
Agree	112 (88.9)	59 (80.8)		
Don't know	1 (0.8)	0		
Takes care of the resident				
Disagree	1 (0.8)	1 (1.4)	3.6 (4)	0.467
Neither disagree nor agree	1 (0.8)	2 (2.7)		
Agree	122 (96.9)	70 (95.8)		
Don't know	0	0		
Motivates to do their best				
Disagree	5 (4.0)	2 (2.7)	20.7 (6)	0.002*
Neither disagree nor agree	4 (3.2)	0		
Agree	115 (91.4)	70 (95.9)		
Don't know	1 (0.8)	1 (1.4)		
Personally helps the resident having problems				
Disagree	3 (2.4)	3 (4.1)	1.8 (5)	0.882
Neither disagree nor agree	3 (2.4)	1 (1.4)		
Agree	116 (92.0)	65 (89.0)		
Don't know	3 (2.4)	3 (4.1)		
Has high level of general preparedness				
Disagree	2 (1.6)	0	5.4 (5)	0.371
Neither disagree nor agree	1 (0.8)	2 (2.7)		
Agree	118 (93.7)	70 (95.9)		
Don't know	2 (1.6)	1 (1.4)		
Checks practical skills using a checklist				
Disagree	15 (11.9)	15 (20.5)	7.6 (6)	0.267
Neither disagree nor agree	8 (6.3)	7 (9.6)		
Agree	87 (69.0)	46 (63.0)		
Don't know	12 (9.5)	5 (6.8)		
Grades fairly				
Disagree	5 (4.0)	1 (1.4)	16.6 (5)	0.005*
Neither disagree nor agree	3 (2.4)	0		
Agree	102 (81.0)	61 (83.5)		
Don't know	8 (6.3)	2 (2.7)		

Contd...

Table 2: Contd...

Variables	Residents of 2010 cohort n=126 (%)	Residents of 2008 cohort n=73 (%)	$\chi^2$ (df)	P value
<b>Course</b>				
Is updated				
Disagree	1 (0.8)	2 (2.7)	7.3 (6)	0.298
Neither disagree nor agree	9 (7.1)	9 (12.3)		
Agree	113 (89.7)	60 (82.2)		
Don't know	2 (1.6)	1 (1.4)		
Is relevant to curriculum				
Disagree	5 (4.0)	5 (6.8)	9.1 (6)	0.169
Neither disagree nor agree	6 (4.8)	6 (8.2)		
Agree	110 (87.3)	61 (83.5)		
Don't know	3 (2.4)	0		
Exams and tests are relevant to covered topics				
Disagree	8 (6.2)	5 (6.8)	12.5 (6)	0.052**
Neither disagree nor agree	9 (7.1)	1 (1.4)		
Agree	95 (75.4)	59 (80.8)		
Don't know	6 (4.8)	0		
Interactive methods in use, such as:				
Discussion and dispute				
Disagree	6 (4.8)	5 (6.8)	11.3 (6)	0.053**
Neither disagree nor agree	7 (5.6)	10 (13.7)		
Agree	107 (84.9)	52 (71.2)		
Don't know	0	1 (1.4)		
Interactive methods in use, such as: Group work				
Disagree	9 (7.2)	11 (15.1)	15.4 (6)	0.017*
Neither disagree nor agree	9 (7.1)	7 (9.6)		
Agree	101 (70.2)	45 (61.7)		
Don't know	0	1 (1.4)		
Interactive methods in use, such as: Case discussion				
Disagree	7 (5.6)	3 (4.1)	15.2 (5)	0.010*
Neither disagree nor agree	2 (1.6)	6 (8.2)		
Agree	110 (87.3)	57 (78.1)		
Don't know	0	0		
Interactive methods in use, such as: Role-play				
Disagree	33 (26.1)	27 (37.0)	12.4 (6)	0.049*
Neither disagree nor agree	13 (10.3)	10 (13.7)		
Agree	55 (43.6)	17 (23.3)		
Don't know	8 (6.3)	10 (13.7)		
Training site				
Is well-equipped				
Disagree	18 (14.2)	5 (6.9)	14.9 (6)	0.021*
Neither disagree nor agree	27 (21.4)	6 (8.2)		
Agree	79 (62.7)	62 (85.0)		
Don't know	1 (0.8)	0		
Provides satisfactory flow of patients				
Disagree	21 (16.5)	5 (6.8)	4.7 (6)	0.057**
Neither disagree nor agree	16 (12.7)	12 (16.4)		
Agree	86 (68.3)	55 (75.4)		
Don't know	1 (0.8)	0		

Contd...

Table 2: Contd...

Variables	Residents of 2010 cohort n=126 (%)	Residents of 2008 cohort n=73 (%)	$\chi^2$ (df)	P value
Provides options for research				
Disagree	8 (6.4)	8 (10.9)	2.8 (6)	0.830
Neither disagree nor agree	16 (12.7)	9 (12.3)		
Agree	95 (75.4)	52 (71.2)		
Don't know	3 (2.4)	2 (2.7)		
Provides options for practical skills acquisition				
Disagree	8 (6.4)	4 (5.5)	5.9 (6)	0.439
Neither disagree nor agree	11 (8.7)	10 (13.7)		
Agree	104 (82.5)	58 (79.5)		
Don't know	1 (0.8)	0		
Takes care of the resident				
Disagree	3 (2.4)	2 (2.8)	4.6 (5)	0.462
Neither disagree nor agree	1 (0.8)	4 (5.5)		
Agree	121 (96.0)	66 (90.4)		
Don't know	1 (0.8)	0		
Participation in Rounds				
Disagree	12 (9.5)	12 (16.5)	8.6 (6)	0.051**
Neither disagree nor agree	5 (4.0)	1 (1.4)		
Agree	101 (70.2)	60 (82.2)		
Don't know	3 (2.4)	0		
Night duties				
Disagree	25 (19.9)	19 (26.0)	10.1 (6)	0.052**
Neither disagree nor agree	6 (4.8)	1 (1.4)		
Agree	76 (60.3)	50 (68.5)		
Don't know	5 (4.0)	0		
Surgical operations				
Disagree	39 (31.0)	30 (41.1)	12.4 (6)	0.054**
Neither disagree nor agree	2 (1.6)	2 (2.7)		
Agree	58 (46.0)	38 (52.1)		
Don't know	4 (3.2)	1 (1.4)		
Participation is useful in Resident's presentations				
Disagree	6 (4.8)	5 (6.8)	4.8 (6)	0.565
Neither disagree nor agree	10 (7.9)	6 (8.2)		
Agree	97 (77.0)	68 (79.5)		
Don't know	6 (4.8)	2 (2.7)		
Journal clubs				
Disagree	10 (8.0)	12 (16.4)	9.2 (6)	0.056**
Neither disagree nor agree	11 (8.7)	8 (11.0)		
Agree	97 (77.0)	48 (65.7)		
Don't know	5 (4.0)	3 (4.1)		
Problem-based learning				
Disagree	10 (7.9)	13 (17.8)	15.4 (6)	0.017*
Neither disagree nor agree	9 (7.1)	11 (15.1)		
Agree	67 (53.2)	23 (31.5)		
Don't know	32 (25.4)	22 (30.1)		
Scientific conferences				
Disagree	4 (3.2)	5 (6.8)	17.3 (6)	0.008*
Neither disagree nor agree	7 (5.6)	2 (2.7)		
Agree	111 (88.1)	59 (80.8)		
Don't know	3 (2.4)	3 (4.1)		

Contd...

Table 2: Contd...

Variables	Residents of 2010 cohort n=126 (%)	Residents of 2008 cohort n=73 (%)	$\chi^2$ (df)	P value
The best method to check knowledge is				
Oral exams				
Disagree	5 (4.0)	0	14.0 (6)	0.030*
Neither disagree nor agree	2 (1.6)	8 (11.0)		
Agree	115 (91.2)	64 (87.7)		
Don't know	1 (0.8)	0		
Tests (paper-based assessment)				
Disagree	47 (37.3)	22 (30.1)	8.6 (6)	0.198
Neither disagree nor agree	19 (15.1)	17 (23.3)		
Agree	49 (38.9)	32 (43.8)		
Don't know	1 (0.8)	0		
Practical skills checkups				
Disagree	1 (0.8)	1 (1.4)	8.8 (5)	0.119
Neither disagree nor agree	3 (2.4)	8 (11.0)		
Agree	108 (85.7)	61 (83.6)		
Don't know	1 (0.8)	0		
Rotation system within departments encourages learning				
Disagree	35 (27.7)	18 (24.6)	14.3 (6)	0.027*
Neither disagree nor agree	0	11 (15.1)		
Agree	83 (70.4)	40 (54.8)		
Don't know	0	2 (2.7)		
Self-assessment of theoretical knowledge				
Very bad	0	1 (1.4)	4.3 (5)	0.505
Bad	0	0		
Satisfactory	14 (11.1)	9 (12.3)		
Good	70 (55.6)	35 (47.9)		
Excellent	36 (28.6)	27 (37.0)		
Don't know	4 (3.2)	1 (1.4)		
Self-assessment of practical skills				
Very bad	2 (1.6)	0	6.4 (6)	0.381
Bad	3 (2.4)	0		
Satisfactory	21 (16.7)	6 (8.2)		
Good	62 (49.2)	45 (61.6)		
Excellent	32 (25.4)	21 (28.8)		
Don't know	4 (3.2)	1 (1.4)		
Evaluation of the course overall value				
Very bad	0	0	3.9 (3)	0.275
Bad	0	0		
Satisfactory	2 (1.6)	3 (4.1)		
Good	22 (17.5)	20 (27.4)		
Excellent	101 (80.2)	49 (67.1)		
Don't know	0	0		
Evaluation of the supervisors' effectiveness				
Very bad	2 (1.6)	2 (2.7)	6.2 (6)	0.400
Bad	1 (0.8)	0		
Satisfactory	1 (0.8)	1 (1.4)		
Good	11 (8.7)	13 (17.8)		
Excellent	110 (87.3)	56 (76.7)		
Don't know	0	1 (1.4)		

n: Number, df: Degrees of freedom, \*Statistically significant, \*\*Marginally statistically significant

## DISCUSSION

Our results indicated differences in how final year trainees of 2008 and 2010 cohorts evaluated their residency program components including supervisor's teaching abilities and professionalism, didactic course and department indicators such as opportunities for theoretical and practical skills acquisition (i.e., group-work, case discussion, role-play, etc.), participation in problem-based learning and scientific events, and knowledge assessment methods at YSMU after application of reforms in residency programs and curricular and pedagogical improvements.

We found statistically significant difference between final year residents of 2008 and 2010 in respect to their perceptions on supervisor's motivation to do the best. In fact, we anticipated that the difference in theoretical and practical experience across the training duration could affect the evaluation. However, trainees graduated in 2008 still lacking more opportunities to get involved in practice, could perceive more motivation and encouragement from their supervisors, whereas more experienced residents graduated in 2010 feel more self-confidence and generally do not rely on motivation. A similar interpretation also has been indicated in surveys conducted elsewhere [14]. Similarly, our finding indicating a difference in perception of fair grading may be result from the fact that grading criteria become stricter as residents become more experienced and skillful after the reforms [15]. However, the actual difference is still very small and may have a statistical but not real significance. In addition, under the new pedagogical reforms, individual supervisor's role becomes evident. In this respect, it could be expanded throughout residency programs likewise in residency training programs elsewhere [16]. Summing up, the establishment of individually assigned supervisors will need more time to be properly evaluated.

Trainees evaluated interactive teaching methods comparably low in both groups. Graduated in 2008 trainees evaluated both group work and case discussion as much less valuable as did the final year trainees of 2010. Interactive teaching methods are relatively novel for local residency programs for both groups of residents. However, the 2010 cohort of residents has had more opportunity to experience the modified curricula; therefore, they evaluate those opportunities comparatively higher. Importantly, both groups evaluated role play as being of little value; moreover, only 43.6% of final year trainees of 2010 agreed that role play is in use. These findings are in contrast with the outcomes of similar surveys conducted in 2007 by Rinder and Smith [17] demonstrating that apprenticeship activities (e.g., journal clubs, round style case presentations, research and role-play) are the most popular and one of the most effective methods of interactive learning. Similar surveys and other evaluation research are necessary to better understand the impact and perception of interactive teaching methods. Such research may elucidate pedagogical advances in post-graduate medical curricula in many countries.

Fewer graduated in 2008 trainees than those graduated in 2010 believed that oral exams are the best method of knowledge

assessment. The findings may be explained by the fact that under the new educational method more attention is being paid on test-writing skills of faculty, so that anticipations of tests to cover the taught material more adequately and accurately are higher. Furthermore, statistically significant difference shown for oral exams as the best method of knowledge assessment for both cohorts of trainees could be interpreted by the low quality of multiple-choice tests written for graduated in 2008 residents by untrained instructors, whereas more qualified and relevant tests for trainees of the 2010 cohort are composed by faculty undergone a special training. In this regard, YSMU intends to invite experts from international licensing boards (e.g., United States Medical Licensing Examination, <http://www.usmle.org/>) to provide further training for faculty and instructors to improve test-writing skills. Since, testing system is quite innovative not only for YSMU; we are ready to share the obtained knowledge with medical universities especially in the region.

Our findings report different evaluation of resident's participation in problem-based learning, as well as scientific conferences. At that, fewer residents graduated in 2008 tend to agree that their participation is useful in the above mentioned activities. While there might be many other reasons, we believe that lower evaluation could be interrelated with less satisfaction with the quality of delivery, as indicated in similar surveys [18,19]. However, scientific events and problem-based learning are an essential component of postgraduate medical education across EU countries. Hence, more attention to these activities could be a step forward towards integration with broader European community of postgraduate medical education.

We found statistically significant differences in evaluation of in-department rotations by trainees. Specifically, more residents graduated in 2010 report agreement that in-department rotations stimulate learning and practicing processes. These findings are consistent with those published by Stalmeijer *et al.* in 2009 [20] and elsewhere [21]. We assume that final year trainees of 2010 could have had more time and opportunities to gain experience through in-department rotations at several sites and compare different-style approaches.

## CONCLUSION AND RECOMMENDATIONS

This pilot survey was limited in several ways. We conducted the survey in one institution and did not consider all aspects of cross-national and cross-regional issues. We developed the study instrument based on the international experience, however, its validity and reliability cannot be considered at this point of time. Reporting bias limited the study given the novelty of the evaluation procedure. We did not explore the qualitative component of the survey because of the scarcity of comments received for open-ended questions.

Although time was actually very short to get the adequate picture of evaluation, we summarized the findings of the present pilot survey. Thus, new methods and improved curricula, application of new teaching/training methods and knowledge assessment schemes may improve post-graduate medical

education at YSMU. This particular comparative evaluation of pedagogical and curricular improvements in residency at YSMU shows that similar surveys may be planned and conducted elsewhere. Specifically, many European states and countries in transition from Eurasian region having relevant experience and facing similar challenges may consider this pilot evaluation survey implemented at YSMU as a sample.

Taking into account the findings of the current pilot survey, we would make a number of recommendations. We would suggest considering the outcomes of Armenian survey throughout EU and regional countries where residency programs also undergo major changes and medical training curricula are being modified in accordance with the requirements and standards of the Bologna process. Furthermore, it will be useful to conduct a comparative evaluation of trainees of the same cohort of participants 1 or 2 years later to understand whether the improvements keep working. We would recommend a further research replicating the present study with similar cohorts within YSMU to better understand the impact and perception of interactive teaching methods. Our understanding is that some policy changes in medical education field would be helpful. Finally, dissemination of survey results among the faculty with more focus on elimination of identified gaps will lead to better planning of education process, such as resident-centered approach, introduction of online trainings and medical library/portals.

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