



## Research Article

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## Perceptions of clinical years' medical students and interns about factors affecting their exam performance, King Abdulaziz University, Jeddah

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### Abstract

**Background:** The quality of medical students' academic performance is an essential part of the success of the educational process. The current study was done to identify the perception of clinical years' medical students and interns enrolled in Faculty of Medicine, King Abdulaziz University towards factors affecting their exam performance.

**Methods:** A cross sectional approach was conducted. A multistage stratified random sample method was used to select 600 clinical years' medical students (4<sup>th</sup> - 6<sup>th</sup> year) and interns from Faculty of Medicine. A validated self-administered questionnaire was used. Factors that affect participants' performance in written exam, Objective Structured Clinical/Practical Examination (OSCE/OSPE) and other exams were assessed. Descriptive and inferential statistics were done. **Results:** Most of students perceived that formative assessment (83.5%) and receiving feedback (84.8%) enhancing their performance. However, only 32.5% reported that Self-Directed Learning (SDL) improves it. Depression affects females' performance more than males ( $X^2= 11.01, p < 0.01$ ). About two-thirds of participants agreed that motivation from instructors before OSCE enhanced their performance. Most of the students reported that the OSCE is the commonest type of assessment which can cause exam anxiety. About three-quarters (76.0%) of respondents agreed that technical problems during OSPE exam can affect their performance. **Conclusion:** Clarification of assessment methods, formative assessment and feedback can enhance the performance of medical students. Stress and time management courses are recommended.

**Keywords:** Perceptions; medical students; exam; performance; professional development.

### INTRODUCTION

Studying medical curriculum requires a big deal of the cognitive abilities, positive attitudes, time management, positive feelings, and reactions to the challenges that occur during the training [1]. Assessing student performance is a very important and complicated process [2], when the learning goals involve the acquisition of skills that can be demonstrated through action.

The quality of the academic performance and achievement among medical students are essential parts for the success of the educational process. Determinants of students' performance have been the subject of current discussion among medical educators [3]. Medical educators have always become eager about the best ways for formative and summative evaluation of their trainees [4].

"In 2007, the Faculty of Medicine, King Abdulaziz University (KAU), Jeddah, launched a new hybrid system-based curriculum to conform to the prescriptions for curriculum innovation as outlined in the UK Tomorrow's Doctors [5]. Studies conducted to identify factors which affecting students' performance plays a crucial role in medical education due to their ability to spotlight action that can be undertaken as corrective measures for improving academic performance of students [6]. However, little studies were done to explore opinions of medical students about factors that affect their performance in exams.

The current study was done to identify the perception of clinical years' medical students and interns enrolled in Faculty of Medicine, King Abdulaziz University, towards factors affecting their exam performance.

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## METHODS

A cross-sectional approach was used at the Faculty of Medicine, KAU, Jeddah, Saudi Arabia. Clinical years' medical students (4<sup>th</sup> - 6<sup>th</sup> year) and interns enrolled in the Faculty of Medicine during the educational year 2015/2016 were included. A multi-stage stratified random sample method was used. Stratification took into consideration the gender and educational level.

Since the actual prevalence of medical students' perceptions towards factors affecting exam performance in Jeddah is unknown, so the probability of its occurrence was assumed to equal the non-occurrence ( $p = q = 0.5$ ). So, the minimum calculated sample size to achieve a precision of  $\pm 4\%$  with a 95% confidence interval was 600.

A confidential, anonymous, self-administering questionnaire was used. The reliability of the questionnaire was assessed by Cronbach's alpha and found to be 0.81. The face and content validity were assessed by 2 experts. The questionnaire inquired about personal and socio-demographic data. Perceptions of the participants towards factors that affect their performance in written exam, OSCE and OSPE were assessed. Student's responses were evaluated through rating

statements on a three-point Likert scale.

The data was analyzed by using SPSS version 20 (SPSS Inc, Chicago, Ill., USA). Descriptive and analytical statistics were done. Chi-square, Odds ratios and 95% confident intervals (C.I.) were calculated. Significance was considered at  $p < 0.05$ .

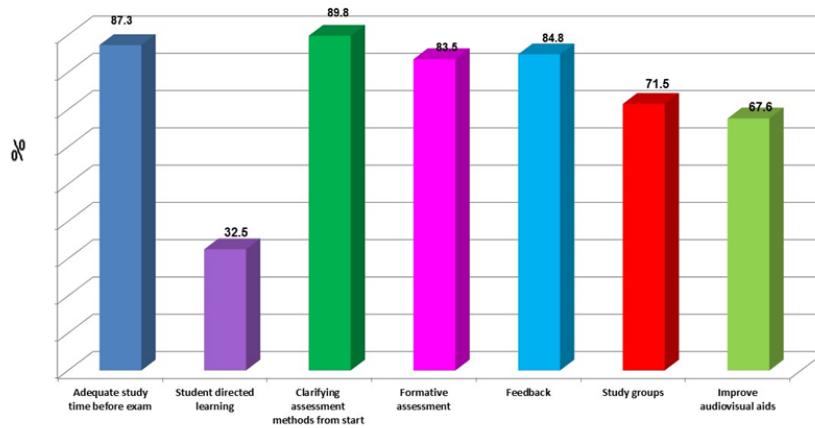
Ethical statement: The study followed the ethical standards of Declaration of Helsinki. It was approved by the Institutional Review Board (IRB) of King Abdulaziz University (KAU) with Reference Number: 262/17. Administrative approvals were also taken.

## RESULTS

The current study involved 600 participants, with a male: female ratio of 1:1.2. Figure (1) shows that more than four-fifths of the participants perceived that clarification of assessment methods from the start of course (89.8%), having adequate time for studying (87.3%), formative assessment (83.5%), and receiving feedback (84.8%) can enhance their exam performance. However, only 32.5% of them agreed that SDL can improve performance.

**Table 1:** Opinions of participants from both gender regarding factors that affect their exam performance

Factors	Gender		Female		$\chi^2$ (P)	OR (CI)
	Male		No.	%		
<b>Having depression before exam:</b>						
Yes	209	40.5	307	59.5	11.01	0.43
No	43	61.4	27	38.6	0.001	(0.26 - 0.71)
<b>Lack of family motivation</b>						
Yes	116	41.4	164	58.6	0.543	0.88
No	136	44.4	170	55.6	0.461	(0.64 - 1.23)
<b>Lack of staff motivation</b>						
Yes	167	43.4	218	56.6	0.041	1.04
No	85	42.5	115	57.5	0.839	(0.74 - 1.46)
<b>Lack of peers motivation</b>						
Yes	110	38.3	177	61.7	4.821	0.69
No	141	47.3	157	52.7	.028	(0.50 - 0.96)
<b>Lack of concentration</b>						
Yes	195	38.8	307	61.2	24.712	0.30
No	57	67.9	27	32.1	0.000	(0.18 - 0.49)
<b>Lack of sleep before exam</b>						
Yes	190	41.2	271	58.8	2.821	0.712
No	62	49.6	63	50.4	0.693	(0.48 - 1.06)
<b>Lack of time before exams</b>						
Yes	166	36.9	284	63.1	30.451	0.33
No	86	63.7	49	36.3	0.000	(.22 - .50)
<b>Lack of study sources</b>						
Yes	133	43.0	176	57	0.000	1.003
No	119	43.0	158	57	0.984	(0.72 - 1.39)
<b>Parental pressure</b>						
Yes	123	47.9	134	52.1	4.276	1.42
No	129	39.3	199	60.7	0.039	(1.02 - 1.97)
<b>Unorganized course materials</b>						
Yes	186	40.9	269	59.1	3.434	0.69
No	65	50	65	50	0.064	(0.47 - 1.02)
<b>Lack of clinical skill training</b>						
Yes	198	41.5	279	58.5	2.296	0.72
No	53	49.5	54	50.5	0.130	(0.48 - 1.10)
<b>Poor staff-student communication</b>						
Yes	195	43.0	258	57	0.002	1.008
No	57	42.9	76	57.1	0.969	(0.68 - 1.49)
<b>Unsuitable learning environment</b>						
Yes	144	45	176	55	1.179	1.20
No	107	40.5	157	59.5	0.278	(0.86 - 1.67)



NB: Each question was separately asked

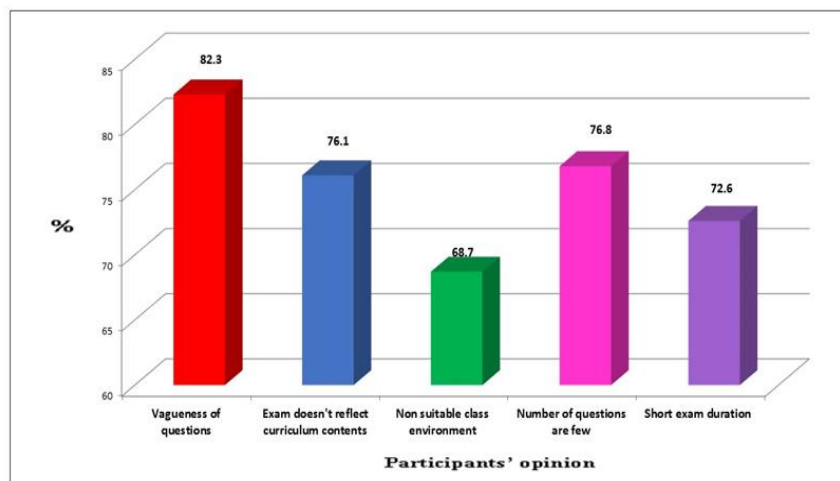
Figure (1): Opinions of medical students and interns about factors that enhance their assessment performance, King Abdulaziz University

Table (1) illustrates that feeling of depression negatively affects exam performance of females (59.5 %) more than males (40.5%), with highly statistically significant difference ( $X^2=11.01$ ,  $p < 0.01$ ). Lack of motivation (family & staff), and poor student-staff communication affects slightly affect performance of females more than males ( $p > 0.05$ ). Females perceived that lack of concentration and inadequate time before exams affected their performance more than males ( $p < 0.001$ ).

Figure (2) demonstrates that most of the participants perceived that their performance is negatively affected by vague (82.3 %) and few number of questions (76.8%). Performance was poorly affected also when the assessment doesn't reflect the curriculum (76.1%), having inadequate exam duration (72.6%) or unsuitable class environment during exam (68.7%).

Table (2): Opinions of medical students and interns about factors that affect their performance in Objective Structured Clinical/Practical Examination (OSCE/OSPE), King Abdulaziz University.

Statement	Degree of agreement		Agree		No opinion		Disagree	
	No.	%	No.	%	No.	%	No.	%
<b>OSCE Exam</b>								
Multiple examiners affect performance	297	53.5	54	9.7	204	36.8		
Examiner's gender affects performance	214	35.7	88	14.7	232	38.7		
Examiner's personality affects performance	495	89.2	19	3.4	41	7.4		
Staff motivation enhance performance	399	71.9	66	11.9	90	16.2		
<b>OSPE Exam</b>								
Number of stations affects performance	390	65.0	120	20.0	78	13.0		
Technical Problems affect performance	456	77.6	70	11.9	62	10.5		
Time of slide affects the performance	317	53.9	100	17.0	171	29.1		



NB: Each question was separately asked

Figure (2): Opinions of medical students and interns about factors affect their performance in written exams, King Abdulaziz University

Table (2) shows that most of the students agreed that examiner's personality (89.2%) and motivation from staff before exam (71.9%) can affect their performance in OSCE. However, 35.7% of participants perceived that examiner's gender can affect performance. Concerning OSPE, 76.0% of respondents agreed that technical problems during the exam affect their performance.

Results showed that 42.6%, 33.8% and 11.6% of the participants agreed that OSCE, long-case clinical exam and written assessment can provoke exam anxiety, respectively. Furthermore, OSPE (4.7 %), log book (3.1 %) and more than one method (4.2%) were reported to provoke exam anxiety.

## DISCUSSION

The concept of "assessment drives learning" is accepted as one of the main pillars of high-quality assessment practice [7]. The majority of participants in the current study agreed that clarification of assessment method from beginning of the course improves their performance.

It is essential that the assessment tasks mirror the learning objectives and curriculum contents [8]. The ability of students to retrieve data in assessments should follow the Bloom's taxonomy [9]. Our results reported that 76.1 % of participants perceived that their performance in written exam is negatively affected when the exam doesn't reflect curriculum contents. This may highlight the importance of revision of the assessment plan.

Providing formative assessment offers important benefit through familiarizing students with the levels of learning required, informing them about gaps in their learning and providing feedback [10]. Only 43.6 % of participants in the current study reported receiving formative assessment during their last medical rotation. This rate needs further improvement for better preparation of students to high stakes summative exams.

The majority of our participants agreed that receiving formative assessment improves their performance which agrees with results from Nottingham University [2] and from Riyadh, KSA [7].

Giving feedback is a critical skill for effective learning and considered the "heart of medical education" [11, 12]. Our results showed that most of the participants reported that receiving exam feedback improves their performance. This goes on line with results of studies from California University, USA [11] and with Riyadh's study [7].

Medical students are expected to possess SDL skills for obtaining lifelong learning behaviors [13]. However, the current study illustrates that only about one-third of medical students agreed that SDL enhances their exam performance. So, it is important to discuss SDL with the students from the start.

Motivation to study can affect the academic performance of medical students [1]. The current study showed that participants perceived lack of motivation from family, staff and peers to affect their exam performance, and it is more apparent among females. This result is in line with results from a Thailand study [14].

Most of our participants reported that having adequate time for studying before the exam will improve their performance. Similar finding was also reported from a recent study done to determine the behaviors of students preparing for the US Medical Licensing Examination (USMLE) [15].

Medical students and interns in the current study reported that their performance is affected by lack of sleep, which goes in line with a study done in Rome [16]. Feeling of depression is one of the main factors that affect the exam performance from opinions of both genders in the

present study, and it is more reported by females, which agrees with other studies [17, 18].

Teachers as role models, their way of coaching and guiding students, their experience and their commitment to clinical teaching were identified as crucial factors in enhancing the quality of learning in the work place [19]. In current study students stated that poor student-doctor communication badly affects their performance, especially among females.

Participants in the current study reported that learning environment and resources affect their exam performance. Another Saudi cross-sectional study also found that learning resources are among factors that significantly affect medical student's cumulative grade point averages (GPAs) [3].

From the opinions of participants in the current study OSCE was the commonest assessment method that provokes anxiety. This agrees with the results from other studies done among medical and premedical students [20, 21, 22]. This may give an alarm for the importance of decreasing anxiety that may accompany OSCE through conduction of formative OSCE workshops, etc.

Our participants perceived that the personality of the examiners, presence of multiple examiners and examiners' gender can influence their performance in OSCE. Similar results were reported from a study conducted in Malaysia and found that about half of the students raised concerns that personality and/or gender were potential sources of bias that could affect their exam scores [23].

Similarly, 53.9% of our participants felt that shortage of time at OSPE stations can affect their performance, which agrees with results of Malhotra, *et al* [24], who reported that about two-fifths of their students reported the same opinion.

High quality questions are important for medical student assessments [25]. Vague terms should be avoided in the exam as it may cause students to incorrectly recognize the term as meaning something different than what intended to be asked by the examiner [26]. Students in the present study perceived also that vague exam terms can affect their performance.

## CONCLUSION

Most of the participants perceived that clarification of assessment methods from the start of the course, presence of formative assessment, receiving feedback, and taking more time for studying before the exams can enhance their exam performance. On the other hand, feeling of depression was the commonest factor which negatively affected participants' performance (especially among females). Implementation of more ongoing formative assessments and providing feedback before high stakes exams are recommended. Stress and time management courses are required. Improve learning resources and support services are also recommended.

**Conflict of interest:** none.

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