

# Medical Students' Attitudes towards Comprehensive and Basic Sciences Exam Questions in Birjand University of Medical Sciences

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## Abstract

**Background and purpose:** Basic medical sciences, not only in its traditional form as basic sciences, but also in its modern forms like Biotechnology and Genetics has indicated a highly applicable potential in the prevention, diagnosis, and treatment of illnesses. Therefore it is essential to improve basic sciences education quality, and because clinical students are in direct contact with medical issues, their judgment towards the clinical application of these lessons is crucial. This study was to analyze the clinical students' attitude towards the basic sciences and their general questions in Birjand University of Medical Sciences.

**Methods:** This descriptive-analytical study was conducted in 2006. All the medical students at the levels of Trainee I and II, and interns in Birjand University of Medical Sciences took part in this study. Data collection tool was a self-administered questionnaire. In this study, the questions from three periods of comprehensive exam from September 1380-1382(2001-2003) were used, then 60 questions were chosen via the random sampling and given to all clinical students and for each scientific question, one attitude assessment question was given so that the responder could represent his attitude on the Likert scale. The basic sciences courses and the necessity of specific courses in the basic level were analyzed in the further questionnaires. Then the SPSS software and the Chi-Square exam were used in order to analyze the data, and a P value of  $<0.05$  was considered significant.

**Results:** The number of participants in this study was 95 students, from which 27 (28.4%) were men and 68 (71.6%) were women. According to most students (75.8%) there was no significant relationship between the questions of comprehensive exam of basic sciences and the studied courses in the basic sciences' period, and the questions were not so applicable. There was no significant difference between the male and female ideas and students at various levels on the matter ( $p>0.05$ ). From the viewpoint of the questions being applicable, the physiology (74.8%) and microbiology (74.8%) had the highest percentage of responses, and Biochemistry (69.5%) had the lowest. The necessity of specific courses was analyzed; anatomy (88.4%) and ESP (77.9%) were on top, and the Histology lab (14.7%) and Biochemistry lab (9.5%) were placed last. Among all the students, 61.1% had an opposing attitude towards the relation of basic sciences' courses with the clinical application (clinical application in practice). 49.5% of the students did not even remember the basic sciences' material. 60% evaluated the basic sciences' period to be weak, and 73.7% believed that the courses' duration to be inappropriate. Interns had a more positive feedback towards the application of the basic sciences exams than the trainees, and 61.1% had an opposing attitude towards the relation of basic sciences and their clinical application, and 71.6% of them were agree to the simultaneous study on the basic and clinical courses. There was no significant difference between the male and female students, or the students from various levels on the matter ( $p>0.05$ ).

**Conclusions:** The innovation of new teaching methods in basic sciences, along with its applicable examples could partially change the students' attitude. The questions of the exam should be as applicable as possible, and therefore reduce the gap between clinical and basic sciences.

**Keywords:** BASIC SCIENCES' COURSES, BASIC SCIENCES' COMPREHENSIVE EXAM QUESTIONS, ATTITUDE, CLINICAL MEDICAL STUDENTS

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## Introduction

Medicine has special features. General course of this field represents in 279 units, during 7 years (1).

Except Shahid Beheshti University of Medical Sciences, in other Iranian universities, medical education is represented in the traditional four-staged manner (basic sciences, physiopathology, clinical clerkship, and internship) (2, 3). Each stage is a prerequisite for the next one, and each student must participate in two comprehensive exam during his studies, meaning the basic sciences and pre-internship exam, and would only be allowed to continue his studies in the next stage if he passes these exams.

Based on the program defined by the Ministry of Health and Medical Education, by using the basic sciences exam, the students' scientific qualifications in order to enter the physiopathology and clinical levels are measured (4).

On the other hand, the achieved rank results in a scientific validity for the university, which is the criterion for education quality in that university. Birjand University of Medical Sciences has been able to prove itself many times on this scale, and holds a record in comparison to other universities on the same level, therefore this study could help give a closer insight towards the matter and the students' attitudes.

The lack of relevance between the concepts taught in the basic course with professional and educational needs in the internship phase and after graduation, and also the loss of retention of these studies, are problems of this process (2). Basic medical sciences, not only in its traditional form as basic sciences but also in its modern forms such as biotechnology and genetics, had indicated a high potential in the prevention, diagnosis,

and treatment of illnesses. Therefore, it is essential to improve its education quality (3), and since the clinical students are in direct contact with medical issues, their judgment towards the clinical application of basic sciences courses is crucial, and they could also represent appropriate solutions in order to resolve the defects. This study was to analyze the students' attitude towards the basic sciences courses and the basic sciences comprehensive exams in Birjand University of Medical Sciences.

## Methods

This descriptive-analytical study was conducted in 1385 (2006). All the studying clinical students at the levels of trainee I and II, or interns in Birjand University of Medical Sciences took part in this study. The data collection tool was designed as a questionnaire. The basic sciences comprehensive exam contains 200 scientific questions. In this study, the questions from three periods of comprehensive exam from September 1380-1382 (2001-2003) were used. Random sampling method was used and one question was chosen from each 10 (total of 60), so that the questions were numbered 1-600, and one question was randomly chosen from the first 10, and after that by adding number 10 each time, the next question was given. The method was filling out a questionnaire with no need to attend. In the first row of the questionnaire, the number of each question was given, separated through the courses, the second row was about the relationship between the taught basics and questions, and the third row which was graded based on the Likert scale, analyzed the clinical application of the questions. Actually for each scientific question, one attitude question was placed asking whether "knowing this fact will help you in the clinical studies" or "is there any relationship between the studied basics and the questions?" The responder could represent his answer on a Likert scale, somewhere between totally effective to totally useless.

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In the next questionnaire, the basic sciences period was analyzed based on its time duration, education duration, and its programming. This questionnaire consisted of 10 questions, and measured the attitude of medical students based on the Likert scale, and at the bottom of the questionnaire, a table was included to evaluate the necessity of the specific courses in the basic sciences period. After collecting the data, the SPSS software and Chi-Square exam were used in order to analyze the data, and ( $p < 0.05$ ) was noted as the significant threshold.

## Results

Of 95 students participated in this study, 27 (28.4%) were men, and 68 (71.6%) were women, which studied at three levels of trainee I (33 students), trainee II (31 students), and internship (31 Students). According to most students (75.8%) there was no relationship between the comprehensive exams of basic sciences with

the courses which had been taught in the basic sciences' phase. There was no significant difference between male and female opinions from different levels on the matter ( $p > 0.05$ ) (Tables 1 and 2). The applicability of questions, Physiology (74.8%) and Microbiology (Mycology, Parasitology, and Virology) (74.8%) had the highest percentage of responses, and Biochemistry (69.5%) had the lowest. The necessity of specific courses was analyzed; anatomy (88.4%) and ESP (77.9%) were on top, and the histology lab (14.7%) and Biochemistry lab (9.5%) were placed last. There was no significant difference between the male and female students, or the students from different levels on the matter ( $p > 0.05$ ). Most of the students (44.2%) evaluated the questions as partially applicable, and the interns had a more positive feedback than the trainees towards the applicability of the questions. Also among other results, 73.7% of all the students evaluated the basic sciences phase total time as inappropriate. In this study, 23 (24.2%) of all the students

**Table 1.** Comparison of the students' opinion from various stages, regarding the questions' relation with the studied materials in the basic sciences

Student Opinion Stage	Irrelevant		Somewhat Relevant		Relevant		Total	
	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
Trainee I	8	24.2	16	48.5	9	27.3	33	100
Trainee II	9	29	15	48.4	7	22.6	31	100
Intern	8	25.8	16	51.6	7	22.6	31	100
Total	25	26.3	47	49.5	23	24.2	95	100

$X^2=0.38$  DF=4 P=0.98

**Table 2.** Comparison of the students' opinion from various stages, regarding the application of basic science questions

Student Opinion Stage	Non-Applicable		Somewhat Applicable		Applicable		Total	
	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
Trainee I	11	33.3	15	45.5	7	21.2	33	100
Trainee II	10	32.3	14	45.2	7	22.6	31	100
Intern	9	29	13	41.9	9	29	31	100
Total	30	31.6	42	44.2	23	24.2	95	100

$X^2=0.60$  DF=4 P=0.96

**Table 3.** Male and female students' opinion regarding the basic sciences' course duration

Student Opinion Sex	Inappropriate		Somewhat Appropriate		Appropriate		Total	
	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
Male	22	81.5	2	7.4	3	11.1	27	100
Female	48	70.6	10	14.7	10	14.7	68	100
Total	70	73.7	12	12.6	13	13.7	95	100

$X^2=1.31$  DF=2 P=0.58

**Table 4.** Male and female students' opinion regarding the material studied in basic sciences, and their clinical application

Student Opinion Sex	Against		Abstinent		Compliant		Total	
	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
Male	17	63	5	18.5	5	18.5	27	100
Female	41	60.3	21	30.9	6	8.8	68	100
Total	58	61.1	26	27.4	11	11.6	95	100

$X^2=2.67$  DF=2 P=0.26

**Table 5.** Male and female students' opinion regarding the simultaneous study of basic sciences and clinical courses

Student Opinion Sex	Against		Abstinent		Compliant		Total	
	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
Male	2	7.4	7	25.9	18	66.7	27	100
Female	6	8.68	12	17.6	59	73.5	68	100
Total	8	8.4	19	20	68	71.6	95	100

$X^2=0.83$  DF=2 P=0.70

determined the questions to be applicable, which 29.9% were interns, 21.2% were grade I trainees, and 22.6% were grade II trainees. 7 students were male, and 16 were female.

42 (44.2%) students evaluated the questions to be partially applicable, from which 41.9% were interns, 45.5% grade I trainees, and 45.2% grade II trainees.

30 (31.6%) students determined the question were inapplicable, from which 29% interns, 33.3% grade I trainees, and 32.3% grade II trainees.

Of all the students, 73.7% evaluated the duration to be inappropriate, (Table 3). Also among all the students, 61.1% had a negative attitude towards the basic sciences and their clinical application; there was a significant difference between male and female students' regarding the matter (Table 4). Most of the students (71.6%), agreed with the simultaneous study of the basic and clinical sciences (Table 5), and also 86.3% of the

medical students agreed with the substitution of the integrated curriculum.

Of all the participants, 60% considered the basic sciences phase as weak, with no significant difference between male and female students. Of all the students 49.5% did not remember the basic materials, and only 16.8% remembered them.

## Discussion

Medical education has been changed and revolved in many universities around the world, and many methods have developed for increase learning, motivation, retention of learning, clinical decision making, and create self-directed learning. the idea of being applicable based on the society's needs and being compatible with the professional needs in the current decade, has led to changes in the content of medical education in many universities around the world, and it has brought forth the idea of medical education

based on the social and professional needs. Basic medical sciences, not only in its traditional form as a basic science but in its modern form like biotechnology and genetics, has proven its potential in the prevention, diagnosis, and treatment of illnesses, therefore it is essential to improve its learning quality, and because clinical students are in direct contact with medical issues, their judgment towards the clinical application of these lessons are crucial. Various studies have studied the matter in Iran (1-9).

In this study, which was conducted in Birjand University of Medical Sciences, 61.1% of the total clinical students had a negative feedback towards the relationship between the basic studies and the clinical application, and 60% of the basic sciences' students regarded it to be weak.

49.5% of the clinical students stated they have forgotten the basic courses, and only 16.8% said that they remember these subjects. The better retention of some courses in the clinical course could be due to the stronger connection of their content with some clinical matters, or being repeated over later courses, or a better choice of contents and exam questions in the basic studies' period.

On the other hand, the comprehensive exams are the most important exams that could largely evaluate the medical students' abilities in passing the general medical courses (7, 8).

A descriptive study was conducted in 1380 (2001) at Qazvin University of Medical Sciences, titled as the evaluation of the basic medical sciences' exam results at its 12-24<sup>th</sup> periods. In this study, the results of 12-24<sup>th</sup> basic sciences exam in each course were analyzed after being classified by stage, degree, average, and percentage of responses, which based on the obtained results, the average number of accepted students of various courses was 84.8% and the actual numbers varied somewhere between 77.8 to 93.9%, which the highest obtained grade was "very good" for microbiology, embryology, anatomy, histology, nutrients, and psychology in the 24<sup>th</sup> and some of the previous periods,

and the grades were not so appropriate in the fields of English, genetics, hygiene, pathology, immunology, and parasitology, which made them eventually reach the conclusion that education groups/department must improve their education quality by holding inner sessions, and inner-group evaluations (1).

In our study, which was conducted on medical students of Birjand University of Medical Sciences, there was no significant difference between opinion of male and female students, and also being in different stages regarding the application of the basic sciences exam questions. In an article that was written by Seyyed Hassan Emami et al in Isfahan, similar results were obtained (2).

The students' opinion regarding the application of the questions were: physiology (74.8%), microbiology (mycology, parasitology, virology) (74.8%), anatomy (73.3%), ESP (70.5%), pathology (70.5%), histology (70.5%), and Biochemistry (69.5%), which according to obtained results, Physiology and Microbiology (mycology, parasitology, virology) courses had the maximum application, while Biochemistry had the least.

Compared to a study conducted in Isfahan, the most negative feedback was about the applicability of questions related to Biochemistry, genetics, physiology, embryology, and psychology. The Biochemistry questions had the least percentage in terms of applicability, which were the same in both studies (2).

In a table which the necessity of the specific courses within the basic sciences were evaluated, anatomy (88.4%) was on top, ESP (77.9%) in second place, and physiology (73.7%) was in third place. Histology lab (14.7%) and Biochemistry lab (9.5%) were in last place and other courses were somewhere in between with no significant difference of opinion about the necessity of mentioned courses between male and female students, or those who studied on different stages.

## Conclusions

Due to the negative feedback expressed by the medical students towards subjects such as Biochemistry, it seems some students need more awareness about the importance of this course and its lab.

The basic sciences comprehensive exam should be as applicable as possible, in order to both improve the retention of studied material, and to omit the gap between the basic and clinical courses.

### Recommendation

Based on the students' opinion expressed in this study, one of the solutions for making the basic sciences more applicable for medical students could be the simultaneous study of clinical and basic sciences' courses.

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