

Original Article

The Medical Students' Attitude toward the Application of Bacteriology Course in Clinical Medicine at Kermanshah University of Medical Sciences in the First Semester of 2013-14

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Abstract

Introduction: Lack of coordination between academic education and their application in the workplace is a common gap between theory and practice. This issue of concern has been discussed among planners of medical education. In this study, the attitude of medical students, externs and interns, was evaluated about the clinical applications of bacteriology.

Methods: One hundred and fifty four medical students, externs and interns, in the first semester of 2013-14 at Kermanshah University of Medical Sciences were included in this study. The research tool was a researcher made questionnaire containing the demographic information and questions to evaluate the clinical application of bacteriology. There were 16 questions for evaluation of students' attitude and the collected data was analysed using statistical methods and t test.

Results: The population included 97(63%) externs and 57(37%) interns. There was no significant difference between the attitude of externs and interns toward the clinical application of general bacteriology. However, the interns had a stronger positive view on clinical application of systematic bacteriology comparing to the externs. Moreover, the students had a positive view on dividing the bacteriological curriculum into two parts and its teaching in general and clinical parts of medical education.

Conclusion: The results indicated the intermediate satisfaction of students, externs and intern for clinical application of bacteriology. Furthermore, there was a strong positive attitude among students for division of bacteriological curriculum into two parts and teaching them during general and clinical courses. From clinical students' point of view, in particular for interns, the systematic bacteriology has a better clinical application than general bacteriology.

Keywords: Bacteriology, Clinical application, Medical students

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Introduction

The growth and development of any society, in all aspects, including economic, social, and cultural empowerment are dependent on human resources. In the meantime, education is considered as one of the key factors in the training of manpower. Curriculum for the training of manpower prevents the waste of time and the capabilities of trainees and also prevents wastage of money (1). Lack of coordination between trained knowledge and its application in the workplace which is referred to as the gap between theory and practice is one the discussing issues and concerns for educational planners (2). In this case, Hewison and Wildman refer to the imbalance between cognitive knowledge and practical skills in the educational systems that causes the lower level of skills compared to the knowledge (3). The relationship and coordination between the teaching quality of basic medical sciences and their clinical applications is a big concern for educational planners in different countries and communities (4). Evaluation of the quality and quantity of health services in the community suggests that health service providers have not been able to meet the needs of society effectively and to promote a good quality. It seems that the poor quality of these services may partly be due to the shortcomings of educational programs (2, 4).

The basic medical subjects are fundamental basic science courses that make up the bulk of medical education for medical students in all grade levels to help them better diagnose and treat diseases. In fact, in medical education, the basic sciences and clinical sciences are complementary. These two are so integrated that cannot be separated. The overall program of general medicine includes basic sciences, semiology and pathogenesis, clinical training (externship) and clinical practice (internship). Passing all the basic science courses and passing the final exam are conditional for entering into the next level. One of the criticisms of clinical professors and students is the lack of coordination between the basic sciences and clinical courses (5). For many students, the question is whether the current content of the basic science courses to achieve the goal of clinical applications is right. Given the diversity of resources and teaching methods in different universities, it can be expected that differences exist between universities (6). Martinez and colleagues conducted a study in 2001 and showed a lack of coordination between the content of basic courses and clinical application (7). In one study, it was found that the common problems that doctors faced were not included in the university curriculum and some necessary clinical skills had not taught to them (8).

Bacteriology course is one of the basic medical sciences that mastery of that for medical students is an obvious need. Normally this course is taught to medical students as a basic course; therefore, there is a relatively long period before students start clinical courses to use their basic knowledge consequently much of their learning is disremembered. The recent voices for the division of bacteriology course into two parts, and teaching them as the basic and clinical parts have been proposed for medical students, which triggers discussion among bacteriology teachers. In any case, one way to improve the teaching of a curriculum is the assessment of students' perspective about it. On this basis, this research evaluated the students' point of view regarding the clinical application of bacteriology course among clinical medical students, both interns and externs.

Methods

The study population consisted of medical students enrolled in the first semester of 2013-2014 school internship and externship in the Kermanshah University of Medical Sciences, which initially was estimated to include 200 people. The students of all teaching hospitals in the Kermanshah University of Medical Sciences were surveyed. The research instrument was a researcher made questionnaire that included demographic information and questions on the survey. For any question, there were 5 answer choices, including very low, low, medium, high and very high.

A total of 16 survey questions in two parts was designed to cover the topics of practical and theory curriculums of medical bacteriology: general bacteriology with 5 questions and of systematic bacteriology with 8 questions and 3 questions as an overview of the survey. However, due to problems for designing questions for systematic bacteriology survey, questions were designed according to the based organ. Six educational experts confirmed the validity of the questionnaire. Test-retest reliability of the questionnaire was confirmed using a thirty-student population. Care was taken for the questionnaire to be completed by the students at the end of each clinical course (externs, interns) so that the students after gaining enough experience in each course answered the questions. We directly went to various clinical wards in teaching hospitals to give the questionnaires to the students. After collecting the completed questionnaires, the data were extracted and statistically analyzed using t-test of SPSS software, version 21.

Results

In this study, a questionnaire was distributed to 200 students and a total of 159 questionnaires (79.5%), were filled and returned. Out of them 5 cases that were not completed were excluded. As a result, 154 cases (77%) of the questionnaires were analyzed. Of the 154 cases, 97(63%) and 57(37%) were from externs and interns, respectively. Eighty (51.9%) were female and 74(48.1%) were male. The average age of students was 24.26 years. Students were doing dermatology, cardiology, Ear-nose

and throat (ENT), internal medicine, ophthalmology, orthopedics, psychology, neurology, surgery, gynecology, infectious diseases, emergency medicine, pediatrics and urology in hospitals. Statistical analysis between attitudes of students by age, sex and passed courses showed no significant difference. However, in some cases, significant differences between the attitudes of intern and extern students were found (Table 1). In Figures 1 to 3 the comparison of students' view, both intern and extern students, about teaching bacteriology in two parts and an overview of general bacteriology and systematic Bacteriology have been shown.

Table 1. The results of students' view points on bacteriology course

Questions	The percent of students' answer scoring from very low to very high (1-5)										P
	Interns					Externs					
	1	2	3	4	5	1	2	3	4	5	
Provide knowledge about bacterial characteristics	23.2	27.3	40.4	8.1	1	16.7	21.7	43.3	16.7	1.7	0.050
The ways of bacterial dissemination	6.1	14.1	53.5	23.2	3	8.6	6.9	53.4	22.4	8.6	0.302
Knowledge of resistant mechanisms of bacteria	12.1	33.3	31.3	20.2	3	17.2	27.6	34.5	20.7	0	0.340
The methods of bacterial diagnosis in medical Labs	17.5	22.7	41.2	15.5	3.1	20.7	25.9	32.8	13.8	6.9	0.358
The interpretation of results for bacterial diagnosis and antibiotic susceptibility testing	12.1	26.3	35.4	21.2	5.1	10.3	19	41.4	22.4	6.9	0.201
Bacteria cause respiratory tract infections	3	16.2	48.5	28.3	4	3.3	1.7	36.7	36.7	11.7	0.031
Bacteria cause urinary tract infections	3.1	18.4	35.7	33.7	9.2	1.7	15.3	16.9	54.3	11.9	0.025
Bacteria cause gastrointestinal tract infections	2	16.3	48	29.6	4.1	3.4	13.6	42.4	35.6	5.1	0.264
Bacteria cause skin infections	8.4	21.2	45.3	21.1	3.2	1.7	22.4	31	36.2	8.6	0.019
Bacteria cause infections in deep tissues (muscles, joints, fascia, ...)	14.3	27.6	39.8	16.3	2	13.8	19	39.7	19	8.6	0.082
Bacteria cause systemic infections (septicemia, bacteria, ...)	6.2	15.5	47.4	22.7	8.2	12.3	9.3	29.8	24.6	14	0.503
Bacteria cause central nervous system (meningitis)(infections)	6.1	18.2	45.5	23.2	7.1	8.6	15.5	22.4	44.8	8.6	0.609
Bacteria cause nosocomial infections	2	17.3	38.8	33.7	8.2	12.1	15.5	39.7	22.4	10.3	0.075
Dividing the bacteriology course into two parts and teaching them as basic and clinical parts during medical course.	16.3	15.3	25.5	22.4	20.4	5.3	17.5	8.8	29.8	38.6	0.006
The curriculum of bacteriology is appropriate and sufficient for basic concepts	15.2	25.3	38.4	19.2	2	15.8	21.1	38.6	19.3	5.3	0.340
In general, the bacteriology course is responding to students' needs and aims	17.2	33.3	32.3	13.1	4	28.1	15.8	31.6	19.3	5.3	0.528
The average level of students' view	10.3	21.8	40.4	22	5.5	11.2	18	33.9	27.4	9.5	

Note: 1= very low, 2= low, 3= intermediate, 4= high, 5= very high

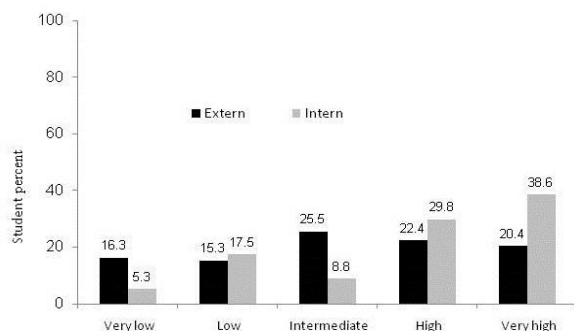


Figure 1: The view points of students on the division of bacterial course into general and clinical parts

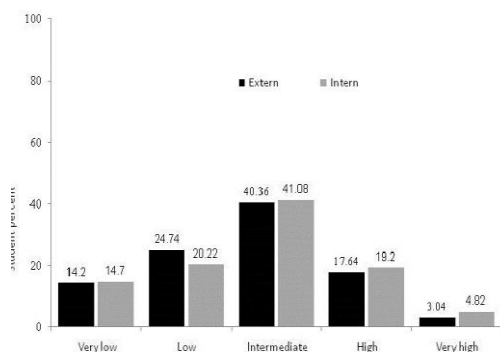


Figure 2: The average view points of medical student about general bacteriology

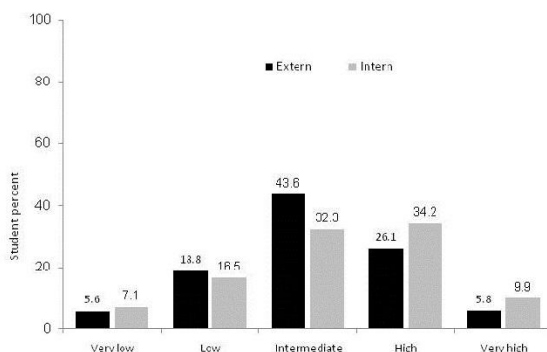


Figure 3: The average view points of medical students about systematic bacteriology

Discussion

User perspective on teaching is an important criterion in educational planning in order to achieve the goals. In recent years, good studies on evaluation of application for different curricula among students have been done. However, comprehensive studies exclusively on the attitudes of medical students toward bacteriology are not available in our country. We hope the results of this study provide a better view to assess the bacteriology course.

The results of this study showed that the overall opinion of students with the questions about teaching bacteriology was near to the intermediate. On the other hand, the general view of interns and externs for curriculum of general bacteriology showed no significant difference and their average view was about intermediate. However, in the case of systematic bacteriology, significant difference between the views of interns and externs in some cases appears to represent an interesting point. First, both interns and externs present a similar view about general bacteriology that may suggest less applicability of the general bacteriology to clinical practice with real patients. Given the knowledge of general bacteriology, its less clinical applicability is consequently understood. However, in the case of systematic bacteriology, the views of intern students are more positive than externs so that they have chosen high and very high choices more for the relevant questions. This may indicate a tangible difference as systematic bacteriology deals with the process of infections, including symptoms, mechanisms of pathogenesis, diagnosis, treatment and epidemiology of bacterial infections. Since interns are more involved in the process of diagnosis and treatment of diseases, the application of systematic bacteriology seems more tangible.

An important finding about the responses of students to a question about the bacteriology course was a clear message to divide the course into two parts and taught as general and clinical courses. The answers to this question were different from the rest of the questions for both interns and externs since they chose the very high, high and intermediate choices. This was statistically significant using t-test ($p < 0.006$). Furthermore, another interesting point was the view of interns for bacteriology division which was stronger than externs so that interns chose the very high answer which was statistically significant by t-test ($p < 0.006$). This message reflects the fact that there is a big gap between the teaching time of bacteriology and the start of clinical practice that leads to the oblivion of much of the bacterial learning. Obviously, this interval is less for externs and as a result, the majority of them chose the intermediate option in response to the bacterial course

division. This fact indicates the need to review the teaching of bacteriology.

Several studies in Iran assessed the students' views on the application of teaching subjects. For example, in a survey the insight of dental students from Tehran University of Medical Sciences, Shahid Beheshti University of Medical Sciences, and Shahed University about the application and quality of basic medical sciences was assessed. They tested 175 students' views based on 1 to 5 scales for responses, and bacteriology received 3.5 points among the basic sciences, which was similar to our results (9). In another study, the role of the anatomy course in achieving clinical objectives from the medical students' view point in Rafsanjan University of Medical Sciences was evaluated and they found trunk anatomy with more application than head and neck anatomy in clinical practice (10). In another study in 2008, the clinical application of nursing courses from the teachers and students' points of view was assessed in Mazandaran University of Medical Sciences and they found 65% of students declaring that the courses were essential. However, students indicated that the application of the courses in the clinical practice was low (11).

Conclusion

The findings of this study indicate the intermediate satisfaction of interns and externs for bacteriology teaching. Also in case of dividing the bacteriology curriculum into two parts and teaching them as general and clinical courses, the results showed a strong positive attitude among students. From the students' point of view, the systematic bacteriology has better application than the general Bacteriology. Further studies in this area can provide complementing information for better teaching of bacteriology to meet the clinical needs of students.

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