Archives of Advances
in Biosciences

Original Article:

Evaluating the Effectiveness of Internship Program of Medical Laboratory Students at Shahid Beheshti University of Medical Sciences

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Cite this article as: Kazerouni F, Shahrokhi SZ. Evaluating the Effectiveness of Internship Program of Medical Laboratory Students at Shahid Beheshti University of Medical Sciences. Archives of Advances in Biosciences. 2023; 14:E41150. https://doi.org/10.22037/aab.v14i. 41150

https://journals.sbmu.ac.ir/aab/article/view/41150

Article info:
Received: 08 Feb 2023
Accepted: 29 Apr 2023
Published: 19 Jun 2023

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Abstract

Introduction: Medical Laboratory graduates are experts who will be responsible for performing clinical laboratories practices, and therefore theses students must acquire the necessary skills and knowledge during the internship course. Identifying the problems that reduce quality of internship and solving these problems seems to be essential to increase efficacy of this course. This research was conducted with the purpose of recognition of the problems, hoping to promote the quality of the internship course.

Materials and Methods: This descriptive cross-sectional study was conducted on twenty undergraduate medical laboratory students during the internship course, at Shahid Beheshti University of Medical Sciences. In order to evaluate the learning level of students internship skills and the response level of learners satisfactions to this training, a man-made questionnaire was used. Data were analyzed by descriptive statistics (mean, SD and percentage) using SPSS.

Results: Scores obtained from the respondents regarding the Performance of the school and the internship coordinators, for questions 1,5 ,8, 11 were intermediate and in response to questions 2,3,4,6,7 and 10 were very good. With respect to the Performance of the Laboratory and the Internship Instructors, students evaluation for question 9 was weak whereas for questions 1,2,3,4,5,8, satisfaction scores were very good and in response to question 6 and 7 excellent scores were obtained.

Conclusion: According to the results of this study, to improve quality of the internship course, the active presence of the educational instructors in the internship sites will have a great effect on increasing the students' motivation and interest to participate in practical internship activities and consequently will have a stronger effect on educational attainment.

Keywords: Internship program, Medical laboratory, Shahid Beheshti University of Medical Sciences

1. Introduction

Laboratory sciences is a branch of medical sciences whose main mission is to train expert human resources in the field of laboratory sciences based on defined and definite professional duties in the society so that it encompasses the basic principles of education, including personality development, increasing the intellect, professional competence, and creating continuous learning skills in graduates to provide favorable laboratory services [1]. The central mission of the field of laboratory sciences is to train individuals who can perform various tests on blood or other fluids

and body tissues in clinical laboratories of hospitals and healthcare centers using the specialized knowledge they have learned with help of the complicated electronic devices and methods [2]. The information and results obtained from these tests help doctors in diagnosing the disease, the treatment process, and maintaining the health of the society [2].

Given that this field is constantly changing and developing, its graduates should be trained in such a way that they have adequate knowledge and skills to adjust themselves to new technology. To achieve this important goal, students have to acquire the essential knowledge and skills during the internship course [3] Nowadays, in the majority of sciences and related fields, particularly medical sciences, the internship course is of great importance since the students acquire the practical in-service experiences required for the assumption of professional responsibility. This training enable students to correlate their learning theories/concepts (at university) with the practical experience during training in this section? [4]. Unfortunately, various problems have led to reduced internship efficiency of laboratory science students, including the increasing number of internship applicants, relative unwillingness to supervise and guide students during internship, and the absence of an effective internship control system by the home university [5]. However, the world's prestigious universities are advancing toward the establishment of a closer relationship between academic education and professional activities by launching independent internships [2]. The increasing progress of human knowledge and the rate of technological changes in today's world have encouraged the education departments to pursue exploration of new educational methods and also identification and elimination of the shortcomings in order to improve knowledge and skills [3].

Considering the importance of training skilled individuals in the field of laboratory sciences, Aziz et al. proposed a comprehensive model of evaluating the laboratory science course aiming to achieve a more efficient program that meets accreditation standards and best practices. [6]. The evaluation of the laboratory science course curriculum studies indicates that revising and upgrading the internship program, results in increasing the graduates' abilities [7], therefore it is better to revise the laboratory science program intermittently and periodically [8] and conduct a comprehensive review in order to recognize the challenges faced during the internship program and how to overcome these challenges to improve the efficiency of the programme and to help interns develop their interpersonal and administrative skills. The current research was conducted to assess problems faced during internship to promote the quality of the course for the students at Shahid Beheshti University of Medical Sciences with a qualitative approach.

2. Materials and Methods

This study was conducted on twenty undergraduate medical laboratory students at the School of Allied Medical Sciences during their internship course, the students entered the study by census method. The data collection tool was a researcher-made questionnaire. The questionnaire was designed after reviewing the relevant literature. The questions were designed based on students' satisfaction level with the training quality, educational facilities, the acquisition of scientific skills, facilities and equipments and social skills such as interaction with laboratory personnel.

The questions were arranged in a questionnaire based on a four-point scale so that the respondents were able to choose one of the options (low satisfaction=1, moderate satisfaction=2, high satisfaction=3, and very high satisfaction=4). The validity of the questionnaire was confirmed during the joint meetings held with the faculty members of the Department of laboratory sciences and the Department of Hematology and Blood Banking of the School of Allied Medical Sciences, Shahid Beheshti University of Medical Sciences. The reliability of the data collection tool was also confirmed after consulting the professors of the Department of Biostatistics with Cronbach's alpha coefficient of 0.9. After receiving a brief explanation about the purpose and the outcomes of the study written consent was obtained from the participants. Furthermore the questionnaires were provided after assuring the respondents that all informations will be kept confidential. SPSS software (version 22) was used for data analysis.

3. Results

The questions to assess the effectiveness of the internship program in this study can be classified into two categories: Questions used to assess the performance of the school and the internship coordinators and questions used to evaluate the performance of the laboratory and the internship instructors in the laboratories.

Assessing the Performance of the school and the internship coordinators

Based on the results obtained the majority of students (52%) expressed their satisfaction at a moderate level regarding "Internship Briefing

Session held for Students", whereas over fifty-percent moderate satisfaction is considered an acceptable result (Table 1). In this survey 36.8% of students reported their very high satisfaction, with the "presention of an accurate program at the beginning of the internship", 63% of them reported high, moderate and low satisfaction and 47.4% reported moderate and low satisfaction (Table 1).

Table 1. Assessing the Performance of the school and the internship coordinators

Questions	Satisfaction Level	Number	Percent	Cumulative percentage
1- Holding a briefing session before the beginning of the internship to familiarize with the internship setting and job description	Low	4	21.1	21.1
	Moderate	10	52.6	73.7
	High	2	10.5	84.2
	Very high	3	15.8	100
2- Presenting a detailed program to the students at the beginning of the internship by mentioning the start date and end date of the internship and the time of attendance in each of the specialized departments of the laboratory.	Low	4	21.1	21.1
	Moderate	5	26.3	47.4
	High	3	15.8	63.2
	Very high	7	36.8	100
3- Interaction with students regarding selection of the internship site	Low	3	16.7	16.7
	Moderate	3	16.7	33.3
	High	7	38.9	72.2
	Very high	5	27.8	100
4-Coordination of the internship coordinators with the training fields for the presence of students in the first visit	Low	4	21.1	21.1
	Moderate	5	26.3	47.4
	High	6	31.6	78.9
	Very high	4	21.1	100
5- Interdepartmental cooperation and coordination between the internship setting and the faculty management	Low	6	33.3	33.3
	Moderate	3	16.7	50.0
	High	8	44.4	94.4
	Very high	1	5.6	100
6- The efforts of the faculty internship authorities to solve internship problems	Low	4	21.1	21.1
	Moderate	5	26.3	47.4
	High	7	36.8	84.2
	Very high	3	15.8	100
7- The support of the school administrative authorities in implementing a well-organized internship program.	Low	3	15.8	15.8
	Moderate	5	26.3	42.1
	High	9	47.4	89.5
	Very high	2	10.5	100
8- Internship Program Schedule	Low	3	16.7	16.7
	Moderate	6	33.3	50
	High	6	33.3	83.3
	Very high	3	16.7	100
9- Satisfaction with internship facilities such as transport	Low	13	68.4	68.4
	Moderate	4	21.1	89.5
	High	1	5.3	94.7
	Very high	1	5.3	100
10- The presence of internship coordinators in hospitals	Low	12	63.2	63.2
	Moderate	-	-	-
	High	4	21.1	84.2
	Very high	3	15.8	100
11- Providing a log book to explain the skills that students are supposed to learn in each laboratory sections	Low	9	47.4	47.4
	Moderate	6	31.6	78.9
	High	3	15.8	94.7
	Very high	1	5.3	100

Regarding "Coordination of the internship coordinators with the training fields for the presence of students in the first visit" 31% were highly satisfied and 47.7% declared moderate and low satisfaction (Table 1).

Based on Table 1, in this survey, 44.4% of students declared high satisfaction and 50% of students had moderate and low satisfaction regarding "interdepartmental cooperation and coordination

between the internship setting and faculty management".

In response to " the efforts of the faculty internship authorities to solve internship problems" the majority of students (36.8%) had high, and 47% had moderate and low satisfaction (Table 1). Apparently, it is necessary to increase the internship coordinators and experts' visit frequencies so that more interactions with co-workers in subsidiary laboratories can be more effective in this regard.Furthermore, in this survey, 47.7% of students reported high satisfaction and 42.1% reported moderate and low satisfaction in response to" The support of the school administrative authorities in implementing a well-organized internship program" (Table 1). Regarding "Internship Program Schedule" 33.3% had high, and 50% had moderate and low satisfaction (Table 1). The low satisfaction with timing of internship is mostly because of the existing timetable clash ,as majority of students plan to prepare for the masters entrance exam during the Internship Program Schedule. However considering curriculum design it is not possible to change the timing. Regarding "the presence of the internship coordinators in the hospitals", "internship facilities such as transport" and "log book access" 63%, 68%, and 47.7% of students declared their low satisfaction, respectively, while 78% had moderate and low satisfaction regarding providing the log book (Table 1).

Assessing the Performance of the Laboratory and the Internship Instructors

In response to the degree of satisfaction with " receptivity of students by the instructors" 36.8% of students reported very high, 63.8% reported high, and finally 31.6% reported moderate and low satisfaction (Table 2). In this context in response to the level of satisfaction with" the respectful behavior of the instructors", 47.4% had very high whereas 52.6% had high, medium and low satisfaction (Table 2).

Table 2. Assessing the Performance of the Laboratory and the Internship Instructors

Questions	Satisfaction Level	Number	Percent	Cumulative percentage
1- Receptivity of students by the instructors	Low	2	10.5	10.5
	Moderate	4	21.1	31.6
	High	6	31.6	63.2
	Very high	7	36.8	100
2- The respectful behavior of educational instructors of training field with students	Low	1	5.3	5.3
	Moderate	2	10.5	15.8
	High	7	36.8	52.6
	Very high	9	47.4	100
3- The educational instructors' justification for fulfilling their training duties	Low	2	10.5	10.5
	Moderate	2	10.5	21.1
	High	8	42.1	63.2
	Very high	7	36.8	100
4- Internship assessment method	Low	2	10.5	10.5
	Moderate	5	26.3	36.3
	High	8	41.2	78.9
	Very high	4	21.1	100
5- Capability and competence of instructors in training students	Low			
	Moderate	2	10.5	10.5
	High	8	42.1	52.6
	Very high	9	47.4	100
6-Responsiveness of instructors to the students questions	Low	1	5.3	5.3
	Moderate	6	31.6	36.8
	High	2	10.5	47.4
	Very high	10	52.6	100
7- The possibility of learning through the practical performance of skills during internship	Low	2	10.5	10.5
	Moderate	2	10.5	21.1
	High	5	26.3	47.4
	Very high	10	52.6	100
8- The attendance supervision system	Low	2	10.5	10.5
	Moderate	5	26.3	36.8
	High	5	26.3	63.2
	Very high	7	36.8	100
9- Instructor's constant monitoring of interns	Low	2	10.5	10.5
	Moderate	6	31.6	42.1
	High	2	10.5	52.6
	Very high	9	47.4	100

In response to "the educational instructors' justification for fulfilling their training duties", 42.1% had high, and 31.6% had moderate and low satisfaction (Table 2). Moreover, regarding degree of satisfaction with" internship assessment method", 41.2% were highly satisfied whereas 36.8% declared moderate and low satisfaction (Table 2). As shown inTable 2, in response to" capability and competence of instructors in training students", 47.7% declared very high, and 52.6% declared high and moderate satisfaction. In the same vein, majority of students (52.6%) were highly satisfied with "responsiveness of instructors to the students questions " (Table 2). In response to" the possibility of developing required skills through practical activities during internship", 52.6% had very high and 47.4% had high, medium, and low satisfaction (Table 2). With respect to "the attendance supervision system", the majority of students (36.8%) had very high satisfaction, and 63.2% had high, moderate, and low satisfaction (Table 2); finally, the majority of students (47.4%) had very high satisfaction with "the Instructor's constant monitoring of interns", while 52.6% had high, medium, and low satisfaction and 42% had medium and low satisfaction (Table 2).

4. Discussion

The current study was conducted with the purpose of analyzing the present status of the internship program of laboratory science students at Shahid Beheshti University of Medical Sciences, while the specific goals of this study were as follows:

1- Determining the students' level of satisfaction with the internship program
2- Identifying the strengths, weaknesses, and problems present in the internship program
3- Providing effective solutions to the identified problems

Considering the survey results regarding holding a briefing class before the beginning of the internship to familiarize the interns with work expectations, description of internship duties., starting and ending dates of the course, etc., it seems students prefer to attend a pre internship briefing session all together; held on a set date rather than in small groups that has been practiced by intern coordinators so far. In this regard, Abedini et al. also showed that holding initial sessions before the internship played an influential role in the students' mental preparation concerning their duties in the internship setting [9].

Concerning" Interaction with the students regarding selection of the internship site" based on the departments general policy, in the first place, the class representative is asked to provide the internship authorities with the list of names of the candidates for each of the laboratories of the hospitals affiliated to Shahid Beheshti University of Medical Sciences through an internal opinion poll, but due to the restricted number of individuals accepted by the laboratories, in many cases, the authorities are finally forced to comment on the related list. Furthermore, we always face the problem of lack of training places at the time of planning to divide students in different specialized departments of hospital laboratories. The restriction of these laboratories is to a great extent, due to accepting paid internship offers from other universities, which unfortunately results in high dissatisfaction among our students. If the laboratories of affiliated hospitals are only forced to accept their students, it is possible to obtain higher satisfaction of our students.

With respect to 'The coordination of the internship coordinators with the training fields for the presence of students in the first visit" and " The coordination between the internship setting and faculty management", it appears that presence of the department's faculty members can increase satisfaction of students from the program The results obtained by Abedini et al. also demonstrated that to improve the quality of internship, arrangements are required for presence of coordinators and faculty members at the internship sites [9]. Given the readiness of the faculty members and the official proposal submitted by the Department of Laboratory science for their presence at the sites for a day or two per week, compliance with this proposition, can help students achieve higher and more meaningful levels of training.

Based on the results of this study, providing the log book is necessary. The log book should be designed by faculty members and the internship supervisory team. Students should receive the logbook at the start of the briefing session at the beginning of the semester. The logbook should provide the learning objectives and give the students and the instructors an overview of of the learning process .The logbook should be used for continuous assessment, to record ongoing interaction between the instructors and students, and an assessment tool for evaluating learning activities at the end of the internship period In Abedini et al.'s study, the students believed that logbook provides a clear setting of learning objectives as well as better awareness of the expectations, duties, and responsibilities from the them during the internship course [9]. Thus, given that logbooks are a valuable

tool for training in clinical settings and promoting the quality of this course, it is necessary to provide students with the log book at the start of the programme.

Considering the students' low satisfaction regarding the presence of internship coordinators in the hospitals, one- or two-day assignment of faculty members of the department of laboratory sciences in the laboratories of affiliated hospitals seems necessary. The active presence of the educational instructors in the internship sites will have a great effect on increasing the students' motivation and interest to participate in practical internship activities and consequently will have a stronger effect on educational attainment [9]. Therefore, major decisions should be taken to facilitate the above subject matter at the university level.

In order to meet the students expectations from" the internship facilities such as transport "it is also necessary to hold meetings with the faculty authorities. The survey results indicated moderate satisfaction of the students to three questions: "Receptivity of the students by the instructors of the training fields", "The respectful behavior of educational instructors of training field with students", and "The educational instructors' justification for fulfilling their training duties". Based on the results obtained by Zahiri and Torabipour's descriptive study the hospital instructors do not fully fulfill their obligations regarding their educational duties ,furthermore insufficient time is allocated to teaching the interns, and there is lack of qualified and capable guidance[10]. Given that the internship instructors have the responsibility of performing the day-to-day laboratory operations ,supervision of interns imposes heavy workload demands on them and therefore authorities need to implement strategies such as financial incentive and moral support to ensure quality learning and improving their job performance motivation. In our study in response to "satisfaction with internship assessment method" only 42.1% were highly satisfied , it seems providing course syllabus and topics outlined in each syllabus that help secure the necessary reading materials and books for the final exam can accurately assess the skills acquired during the internship [9]. Based on this survey, the students' high and very high satisfaction, over fifty-percent, regarding " capability and competence of instructors in training students", "responsiveness of instructors to the students questions", "the possibility of learning through the practical performance of skills during internship", and "the attendance supervision system" are encouraging. Finally Tabrizi and Azami-Aghdash's study indicates that evaluation of the interns' satisfaction with the internship course plays an important role in promoting the internship quality [4]

5. Conclusion

Results of this study reveals that the active presence of the educational instructors in the internship sites will have a great effect on increasing the students' motivation and interest to participate in practical internship activities and consequently will have a stronger effect on educational attainment. Moreover, authorities need to implement strategies such as financial incentive and moral support to ensure quality learning and improving their job performance motivation.

Ethical Considerations

Compliance with ethical guidelines

This article was approved by Shahid Beheshti of University of Medical Sciences′ ethics committe (Reference number IR.SBMU.RETECH.REC.1401.003).

Funding

No funding has received for this work

Conflict of interest

The authors declare that they have no conflicts of interest associated with the manuscript

Acknowledgments

We would like to thank all the participants in this study.

Author's contributions

Conceptualization and Supervision Methodology, Writing – original draft, and Writing – review: Faranak Kazerouni; Investigation, Formal Analysis, Writing – original draft, and Writing – review: Seyedeh Zahra Shahrokhi;

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