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# Experiences of Selected Students in the Scientific Olympiad for Medical Students – A Qualitative Study

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**Title: Experiences of Selected Students in the Scientific Olympiad for Medical Students – A Qualitative Study**

**Abstract:**

**Background:** It is of great importance to identify the talented students in the Scientific Olympiad and pay attention to the upgrade of the quality of these competitions.

**Aims:** The purpose of this study was to explain the experiences of students about the Medical Students' Scientific Olympiad.

**Methods:** This research was a phenomenological qualitative study. Data were collected by open questionnaire (27 students) and semi-structured interview (13 students) who was selected in the Medical Students' Scientific Olympiad. The analyzing of information was performed using the clayze method.

**Results:** Students' experiences were divided into two main themes, including motivating and restrictive factors. The scientific level, planning and implementation, and welfare issues were obtained as the three main categories by analyzing data. The participants suggested four recommendations of holding, side plans, facilities and the notification results.

**Conclusion:** Students' experiences showed that the Medical Students' Scientific Olympiad in Iran is still at an early stage that challenges further the level of knowledge. Therefore, it is necessary to educate the academic facility to be able to design questions with high taxonomy. Also, the attention to the side programs, welfare amenities and recreational programs, which are the motivating factors for the students to participate in these competitions.

***Keywords:*** Scientific Olympiad; Experiences; Medical Students

## Introduction

Recent developments have occurred for science topics and science education in all over the world, and scientific advancements are considered as one of the most important indicators for a country (1). This issue has changed the universities' mission to doing their social responsibility, which is also the expert individuals training (2). Our society needs individuals with thinking, reasoning, theoretical, critical and analytical skills with high ability (3-4).

Concerning, today most universities have become more active than last year's, with a new approach based on creating a competitive scientific and healthy environment as well as identifying talented students for more purposeful researches (3, 5-6). The holding of Medical Students' Scientific Olympiad (MSSO) is one of the effective strategies for this situation that has been hardly considered in recent years (7). Scientific Olympiads are held every year in the world in fields such as biology, phasic thinking and protein modeling related to the Science Ministry (8).

In the Ministry of Health, the MSSO was held for the first time in Isfahan University of Medical Sciences for medical students in graduate and postgraduate degrees in 2009 with the goal the developing of problem solving and reasoning skills, team working, interdisciplinary activities and attention to the aims of the health system (9). The Medical University of Shiraz, Tehran and Tabriz were the next hosts for these competitions to acquire the above skills. Besides, by earning skills and knowledge, they will gain experiences in future jobs due to communication and social interactions are strengthened (10). Therefore, attention to the participants' satisfaction is important to building a peaceful of the volunteers during the Olympiad and encourages them to participate in subsequent competition (11).

In the study of Adibi et al., 58% of the participating students were satisfied with the quality of implementation tournament in the first Olympiad in 2009 (12). Also, Hadi-Zadeh's study showed that 52% and 51% of students believed that the designing of the questions motivated students' problem solving, reasoning and creativity abilities (13). Considering that the main goal of the Olympiads are to motivate the skills of reasoning, problem-solving, creative thinking, collaboration, communication and producing a friendly environment and to address these items, the present research was conducted to evaluate the students' experience participating in MSSO by applying a qualitative approach for the introduce a proper pattern for better holding of these Olympiads.

**Methods**

A qualitative descriptive phenomenological approach was used to collect and analyze the experiences of the students participated in the 3rd, 4th, 5th, and 6th MSSO. This approach has been focused on the experience of students (14). The main question that the authors try to find an answer was the nature and meaning of the best Condition held National Olympiad for medical students. We were selected students who participated in the National Olympiad for three years information about the different stages of competitions, without the limitation and had adequate of age, gender, university and fields (15). Inclusion criteria for selecting participants consisted of experience in the Olympiad for several times. The selection of samples students with lived performed in the form of purposefully. In this method, those who had the most and richest information (16). This process continued to the stage of data saturation. By the time, the researcher felt that extra information couldn't be obtained by continuing the sampling process (17). Data were collected over two phrases. First phrase: We used open-ended questions, Questionnaires consisted of two parts including the demographic information and three open-

ended questions following the points of strength and weakness in competitions points of in competitions, suggestions on the holding of the best Olympiad. Questionnaires were distributed to students in the dormitory when they had more free time to answer the written questions. Thirty-six of them were eligible to participate in the study, the response rate was 75% (n=27). Data were analyzed after the completion of questioners and studying them several times by researchers.

In the next phase, researchers were prepared the guideline of an interview based on the result of the first phrase. The interview was conducted with the student to obtain the deep information. At the begging of the interview, the objectives of the study were explained and the permission was obtained to recording their voice. The ethical subjects have been considered in this study. The participation of the students was voluntary and the content of the interviews was kept confidentially without mentioning the name of interviewees. Interviews were performed by the chief researcher. The duration of each interview differed from 30-40 minutes. Their comments were recorded by the use of a sound recording device. Moreover, handwritten notes can be used by interviewers. The level of data saturation was determined by all researchers. Thirty-six participants enrolled in this study. The content of the interviews was reheard by the researchers several times and was transcribed immediately after the end of each interview. The transcripts were double-checked by independent researchers. To increase the trustworthiness of the study, we considered four criteria; Credibility, Conformability, Dependability and Transferability (18). To obtain credibility, engaged with data (these cases were read and written several times by the two researchers until immersion in the data), member check (chief researcher discussed with the colleges to reach consensus about extracted codes), triangulation (two methods for data collection; questionnaire and semi-structured interview). To conformability, a panel discussion

was held with the participation of the experts on coding. To dependability and transferability, quotations and external auditors were used, respectively. It is noteworthy, the use of organizer experiments and maximum variation sampling (different sex, different levels, and different disciplinary, different universities) were considered. Colaizzi's distinctive seven-step processes were used in analyzing data that these steps are as follows: Each transcript should be read and re-read to obtain a general sense about the whole content, for each transcript, significant statements that pertain to the phenomenon under study was extracted. These statements recorded on a separate sheet noting their pages and lines numbers. Meanings were formulated from these significant statements. The formulated meanings have been sorted into categories, clusters of themes, and themes. The findings of the study integrated into an exhaustive description of the phenomenon under study. The fundamental structure of the phenomenon described. And finally, the validation of the findings have been sought from the participants (19).

**Results:**

The questionnaires were distributed among 36 participants. Twenty-seven participants responded to the questionnaires including 12 males (44.4%) and 15 females (55.6%). In the second phase, 13 students were interviewed to reach data saturation.

Data analysis showed that the students had an emphasis on dormitory status, reception, service, recreational-sports facilities, the correction of test questions, and the manner of test implementation. Therefore, the experiences of the participants were classified into the three general themes, including the scientific level of questions (3 category and 6 Sub category, Table 1), program and the state of implementation of the tests (3 category and 6 Sub category, Table2) and welfare (5 category and 10 Sub category, Table 3).

Participants' experiences from “scientific level of Olympiad” were categorized in two categories (subject of the Olympics, Designing questions) and four Sub category (applicability, General lack, of topics, Matching questions with reference, Scientist level and taxonomy of questions).(table1)

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Table 1: Participants' experiences from Scientific level of Olympiad

| Quotations of participants' experiences | Sub category | Category | Main category |
|---|---|---|---|
| The subject of the Olympics was new and applied. | applicability | subject of the Olympics | Infrastructure of designing questions |
| Only the medical and pharmaceutical disciplines came up with these subjects | General lack of topics | | |
| The questions of the Olympiad did not match the reference.<br>Some of the questions were exactly from the book.<br>Questions were limited to 2 or 3 books. Persian reference was introduced. | Matching questions with reference | Designing questions | |
| The level of questions was good.<br>Students welcomed the design of questions with Conceptual map form.<br>Proposals were very bulky.<br>The questions were somewhat memorable.<br>Sometimes the questions included uncommon cases.<br>It creates mental creativity.<br>Olympiad creates creative thinking.<br>The Olympiad strengthened student problem solving skills.<br>The questions were superficial rather than argumentative.<br>Creativity was not in the questions, it was similar to the exam questions that the book had to be given to memory | Scientist level and taxonomy of questions | | |

Participants' experiences from “program and the state of implementation of the tests” were categorized in 3 categories (Informing, Holding tests, and Announce results) and 6 Sub category (Time and place, Site and media, Conditions during the test, Intervals between tests, How to announce results, Results status). (table2)

Table 2: Participants' experiences of program and the state of implementation of the tests

| Quotations of participants' experiences | Sub category | Category | Main category |
|---|---|---|---|
| Informing about the test location was good | Time and place | Informing | Test infrastructure |
| Informing about the start time of the test wasn't good | | | |
| The opening plan was deleted. | | | |
| The Olympiad was not a media outlet and did not pay enough attention | Site and media | | |
| The test was held on a regularly. | Conditions during the test | Holding tests | |
| Slow music playback had a positive effect During the entrance and before the testing. | | | |
| Caregivers of test session did not know enough about the conditions and rules related to answering questions | | | |
| The opportunity was low in all three stages of the test. | | | |
| The time to answer the questions was short and the test was intensive. | | | |
| The duration of the Olympiad was short. | | | |
| The Olympiad was more like an exam than a science competition. | | | |
| In general, planning was for the hours of the testing and we did not have a special program at leisure. | Intervals between tests | | |
| There was a long interruption between the morning and evening exam. | | | |
| The results were announced late. | How to announce results | Announce results | |
| There was not enough coordination in announcing the results. | | | |
| Details of the results were not announced. | | | |
| The announced results were not acceptable. | Results status | | |
| The protests were not answered | | | |

Participants' experiences from “welfare issues of test” were categorized in 3 categories (Dormitory status, Hospitality, Serving, Hardware and software facilities and Recreational facilities).(table3)

Table 3: Participants' experiences on welfare issues of test

| Quotations of participants' experiences | Sub category | Category | Main category |
|---|---|---|---|
| Dormitories were equipped with self service | Space and distance | Dormitory status | Welfare infrastructure |
| Dormitories were far away from the place of test. | | | |
| Dormitories were far from the city center and there was no access to shopping and sightseeing centers | | | |
| There was no dormitory for the married | | | |
| Access to supervisors was difficult due to the inappropriate location of dormitories. | | | |
| We had difficulty in accessing personal hygiene supplies | Health items | | |
| Quality of catering was suitable among the promises | Among the promises | Hospitality | |
| There was excessive spillage in Catering | Snacks | | |
| There wasn't excessive spillage in snacks | | | |
| The authorities have behaved appropriately in the first encounter. | Personnel | Serving | |
| The dormitory welcoming committee had a good behavior. | | | |
| There was a delay in transportation. | Transportation | | |
| It was better, a separate transportation service was considered for each university | | | |
| There was no internet access in dormitories. | Internet | Hardware and software facilities | |
| The stationery and the table and chair were suitable for the test. | Office equipment and sports | | |
| There were no sports facilities. | | | |
| There was a tour of the students. | Recreational | Recreational facilities | |

The participants' suggestions for better implementation of Olympiads were categorized into four main categories (test implementation, lateral programs, amenities and announcing the results). Student's suggestion in test implementation category were: it is better to hold the Olympics at different educational levels, expanding the area of the Olympiad in the other fields such as laboratory sciences will provide a great opportunity for further interaction between the diagnosis and treatment groups, considering different fields of students and compare them with each other

within the same field and It would have existed schedule appropriate for exam days and the exams do not interfere with the university. In the lateral programs category, a student suggested that should be considered creational facilities for the leisure time of the participants and Workshops should be held for participants during the test days. In the Facilities category, Student recommended that the place of residence of participants should be in places close to the city and online resources should be provided and informing should be suitable for using these resources. In the results announcements category Student recommended; Student rankings should be announced at the end of the Olympiad and the results of the test are announced to each university individually.

Also, the experiences of the students participated in the Medical Olympiad for university students were categorized into two main teams including, restrictive and motivating factors as follows:

Restrictive factor: The main restrictive factors based on the participants' statements, including time-consuming, lake attention to the free time of participants in Olympiad, and inaccessibility to academic supervisors. For example, participant No.3 asserted: "There was a long interruption between the morning and evening exam." In this case, participant No.5 says:" In general, programmers had been planned for the examinations and we did not have a special program at leisure. Also, participant No.8 asserted: "There were no sports facilities. The accessibility to supervisors was difficult due to the inappropriate location of dormitories." And participant No.5 believed that:" Officials can plan workshops for different subjects such as critical thinking, team working, and communication skill during the holding of the Olympiad to meet students from different faculties and strengthen these skills. The opinion of participant No.8 was "Students

from different faculties had been inhabited in separate dormitory and we can't meet them in the free time.

Motivating factor: The main motivating factors based on participant statements were respect to student, welfare falsities, regulate and peacefulness. In this case, participant No.7 says: "The dormitory welcoming committee had a good behavior." Also, participant No.9 statements," The authorities have behaved appropriately in the first encounter. And, participant No.10 asserted:" The stationery, tables and chairs were suitable for the test." And also, participant No.13 believed that:" Slow music playback had a positive effect during the entrance and before the examinations.

**Discussion:**

Nowadays, it is important to be challenged by the creativity and innovation power of students by changing the process of education and training. The holding of Olympiad competitions can challenge the students' reasoning, creativity and problem-based learning skills and enhance cooperation and team working (20, 21). It is necessary to conduct several studies about holding details, including scientific and managerial aspects; therefore the students participating are the most important source for gathering this information.

The results of this study showed that the three main themes have been considered further by students, including welfare issues, lateral programs and the state of implementation of the tests, and scientific level of Olympiad. Modifying these factors have been suggested to better handle the holding of Olympiad.

In the part of the welfare issue, the students have recommended that if the dormitories were close, students would easily access to other colleges. As communication with other volunteers is one of the goals of the Olympiad (10), this subject could be effective in their success and increase their

scientific level. Azami et al. pointed to this issue in their study (4). Most participants had a positive view of offering meals, snacks, and transportation. Unfortunately, some dormitories had not the internet and the lack of accessibility to the internet was one of the important failures at this tournament. Today the internet permits people to collaborate and communicate on-line as well as connect with family (22). The students were satisfied with the writing tools that were given during the tests; however, they preferred that these tools were delivered to the student at the time of admission. Farrell's study in 1998 on the satisfaction and motivation of participants in the sporting events has shown that equipment, physical facilities and easier availability to them are considered to be important volunteers' satisfaction (23).

In the theme of the program and the state of implementation of the tests, the majority of students have evaluated the good planning for the holding tests; however, the lack of sport and scientific tours were the main defect in planning. Lack of sport and scientific tours are shown to be a defect towards improving Olympiads but arranges the trip or short program with the sporting event during competitions is effective on decreasing stress (24). Most students have stated that the results of the tests were announced on the late and also the dedicated time for the examinations was inappropriate. According to examination regulations, the timely announcing of exam results and appropriate test time must be respected (25).

In the Olympiad, most students have objected to the memorable aspect of some questions. They expected that the questions be based on reasoning aspects to challenge many of the skills as the creativity of students as well as reduce the stress among students by creating a healthy academic environment. The study of Vahedi et al. (2014) has shown that stress was one of the major factors in reducing physical and mental power among students participated in the Olympiad (26). Other notable issues in this theme were the deletion of the team competitions. Since team competitions

can increase responsibility in students (27), it is better to consider team competitions in future programs. Based on the experiences of the participants, the specificity of the Olympiad subjects and the impossibility of the participation the students of other disciplines were the other defects of the Olympiad. Increasing the diversity of the subjects and the presence of students from other disciplines stated as respect the fairness of the competition. It was my most important for students to participate in all disciplines, this student's right should not be taken (28). As the students of the second Olympiad in Shiraz, as well as faculty members in the Iranian National Olympiad, have requested a widespread theme for these completions to participate more students (8).

**Conclusion:**

Regarding the importance and nature of the Olympiads, it is necessary to investigate the strengths and weaknesses points, and application of the suggestions of the participants. On the other hand, considering the low records of student Olympiads in Iran, it is necessary that for conducting basic and preliminary studies to identify barriers and utilization essential schedules. Therefore, the application of experiences of participating students, faculty memberships, as well as the experiences of other countries was recommended. The advantage of the current study was that the researchers involved in the Talented Student Office and they were familiar with the problems, characteristics and desires of students.

**Limitation:**

The main limitation of this study was the time of collecting information from the students during examination due to impact the examination stress on accountability.

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**Legend section**

Table 1: Participants' experiences from Scientific level of Olympiad

Table 2: Participants' experiences of program and the state of implementation of the tests

Table 3: Participants' experiences on welfare issues of test