

Challenges Faced by the 11th Scientific Olympiad of the Iranian Medical Students: A Qualitative Study

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ABSTRACT

Background: Holding student scientific Olympiad is a good opportunity to identify students who are able to analysis of health system issues based on the current and future needs of the country. In order to promote the Olympiad, it is necessary to determine the challenges of the Olympiad every year and to determine solutions for them.

Aim: To explain the issues of the scientific Olympiad program of Iranian medical students.

Methods: This study was conducted using content analysis method, and data were collected through 19 Semi-structured, in-depth interviews with experts from March 2019 to April 2020. Participants were selected using purposive sampling methods. Nineteen students, domain leaders, question designers, Olympiad executive experts, and teachers (11 males and eight females) participated in the interviews. The data analysis was performed based on the steps of Graneheim and Lundman's method. The interviews were recorded, transcribed, and subjected to a qualitative analysis by MAXQDA 2018 software.

Results: From the analysis of data, three themes, including forgetting the goals of the Olympiad, improper test structure, and inappropriate planning, were emerging.

Conclusion: Although the scientific Olympiad is a useful and beneficial program for the health system and consequently the society, but if its problems are not solved and due to its tedious and high costs, not only will it not be beneficial for the health system but also can damage it.

Keywords: Scientific Olympiad, Program Evaluation, Content Analysis, Students of Medical Sciences

INTRODUCTION

The Scientific Olympiad is an event held to make a competitive environment for the student groups of medical universities across the country aimed at solving the problems that can help improve the health status^[1]. The medical universities are not merely responsible for training the educated and specialized human resources, but also to identify, grow, guide, and nurture the scientific talents. Holding the competitions and exams, such as Scientific Olympiad of the Students is a good opportunity to identify the individuals who are able to think critically, reason scientifically, theorize, and analyze the problems of the health sector in an applied and scientific manner based on the current and future needs of the country. Therefore, every year, the issues facing the national healthcare system should be identified and the key areas and topics of the Scientific Olympiad should be determined based thereupon considering the objectives and perspectives of the health system^[2].

The Scientific Olympiad of the Medical Students is a unique opportunity for the elite students from all over the country to come together and provides an opportunity to use the potentials of these students in order to solve the problems of the healthcare system. Utilizing these potentials requires a creative, new, and out-of-the-ordinary look at the scientific and executive processes of the annual Olympiad^[3]. It is important to pay attention to the students' satisfaction in order to encourage them to participate in the Olympiad but, the evidence indicates that there have been problems in the previous Olympiads^[4] such that, the experts

have pointed out to the poor cooperation of the universities of rank 2 and 3 in planning and designing the questions, poor motivation (both for the faculty members and students), lack of proper relationship between the universities as well as the lack of resources and facilities as the most important obstacles to holding the Olympiad^[5]. On the other hand, forgetting the goals of the Olympiad has been reported by the experts as another challenge. Also, while participating in the Olympiad, the only objective of some universities is gaining the points and ranks, and only few innovations or creative projects can be observed after the competition^[6].

On the other hand, regarding the disadvantages of the Olympiad, students refer to the factors, such as the non-generality of the Olympiad for all the disciplines, complexity of the proposals, inconsistency of the questions with the resources, designing the questions directly from the books, not introducing any Persian resources, superficial questions, being more like an entrance exam than an Olympiad^[4], evaluation of the memory function and disregard for high levels of creativity, innovation, and reasoning, exclusivity of the clinical reasoning for medicine, non-standard test correction and bias in the scoring tests and giving more importance to the individual rather than group tests. It should also be noted that the universities that have a member in the referee board have less right for objection due to their familiarity with the process of correcting the exams^[7].

Hazrati et al., (2012) in a qualitative and phenomenological study conducted during the 4th Medical Scientific Olympiad used the questionnaires and hold the

semi-structured interviews with 224 selected students aimed at analyzing the students' opinions about the strengths and weaknesses and their suggestions for better Olympiad exams, and they introduced the three themes of welfare, test status, and scientific level of the Olympiads as the influential factors^[8]. Ghojzadeh et al., (2015) in another qualitative study on 20 participants using the open-ended questionnaire and content analysis method in Iran showed that the main necessity and philosophy of the Olympiads improves the performance of the healthcare sector, expanding the relations between the universities, developing the scientific competition, and enhancing the students' creativity. Also, the majority of participants believed that the achievements of these Olympiads were insignificant compared to their costs and the most important obstacles were the lack of proper relations between the universities, lack of proper support for the Olympiads, lack of motivation in the professors, lack of interest in the students, and lack of resources and facilities^[9].

In evaluating the Scientific Olympiads of the Medical Students, various dimensions, such as design and implementation experience^[3, 10-14], quality of content, level of goal achievement^[5], empowerment and creating the loyalty^[15], perspective of the students participating in the Olympiad^[8], views of the elites and faculty members^[6, 9, 16], Olympiad exams^[17-24], academic self-efficacy and stress in the students participating in the Olympiad^[24], and satisfaction level^[25] have been studied. Therefore, given the idea for holding 11 Olympiads until now, and according to the results of the studies and processes, some questions have been raised that need to be answered accurately and clearly.

Of course, holding several Olympiads has been a significant achievement, but due to the newness of this experience, constant changes in the policies, large volume of the Olympiad-related activities at the hosting university and the intense working burden of the organizers and many other issues, there is room for improvement in the process and focusing on solving the problems, which can increase the quantitative and qualitative level of the Olympiad^[26, 27]. Considering the experiences obtained in the previous 11 Olympiads, the importance of the Olympiads, and the need to pay attention to the quality of its implementation, there is a need for reviewing and determining the weaknesses of the Scientific Olympiad and providing solutions for better performance of the students' scientific Olympiad exams. For this purpose, the present study was conducted to explain the problems of the Scientific Olympiad program among the Iranian medical students.

MATERIALS AND METHODS

This research has been conducted by qualitative content analysis to explain the problems in the scientific Olympiad program of Iranian medical students. The population includes all the participants of the scientific Olympiad of the country's medical students. The inclusion criteria included having the experience of holding or attending an Olympiad and willingness to participate in the research. The exclusion criterion was the participants' unwillingness to participate in the study. Nineteen students, Olympiad

teachers and authorities, and scientific and technical committee members of the Olympiad event participated in the study; they were selected by purposive sampling out of those who were willing to participate in the study. To prepare the interview protocol, the participants were first asked several overall questions about the challenges and problems of scientific Olympiads (Please describe your experience of participating in an Olympiad). The questions were different depending on the group of participants. Several general questions were asked repeatedly in the interviews, which led to progressively further items such as "What is your idea about the Olympiad questions (relevance, difficulty level, and understandability)?" All the interviews were recorded by the participants' informed consent. Data was collected by in-depth, semi-structured interviews, and sampling continued to data saturation. The interviews, on the phone and face to face, lasted 10-62 minutes. In the phone interviews, the participants were already informed that their voice would be recorded. All the in-person interviews were conducted done in the participants' workplace based on their wish. The collected data was analyzed by the usual qualitative content analysis with an inductive approach based on Graneheim and Landman's method. After the interviews were recorded, the researcher listened to the interviews, and after obtaining an overall insight, he typed the transcripts. Then, the texts were analyzed, and the concepts were coded. Similar codes were integrated and classified, tagged according to the data.

The types of codes extracted from the interviews were compared and assigned to similar subcategories. Finally, three major categories and 11 subcategories were identified. The reliability and validity of the research were ensured in terms of the four components of credibility, transferability, dependability, and confirmability proposed by Lincoln and Guba^[28].

To determine the credibility of data, there was a constant link between the subject and data (constant comparison). The opinions of the research team regarding the process of interviews and data analysis were considered (peer checking). The interview transcripts and findings were also shared with some of the participants (member checking). In addition, the researcher had a prolonged engagement with participants. In order to determine the dependability of the data, an external observer out of the research team, who was familiar with the methodology of qualitative research, was consulted who had a consensus about the results (external checking). To determine the confirmability of the findings, the researcher also attempted which records all activities and a report of the research process was prepared. The transferability was confirmed by choosing key informants in individual interviews.

RESULTS

Nineteen participants, including students, Olympiad teachers, authorities, and scientific and technical committee members took part in this study. The participants were 11 men and eight women with bachelor's, master's, Ph.D., and professional doctorate degrees (table 1). The findings were reported as three themes and eleven

categories (table 2). The main themes included forgetting the goals of the Olympiad, inappropriate test setups, and inappropriate planning. In the following, each of the main themes and their categories is described by an example of the participants' statements.

Forgetting the Goals of the Olympiad: The classes in this theme included the non-generality of the Olympiad, centralism, lack of accountability of the officials, non-practicality, and unsound competitive atmosphere. About centralism, Interviewee 16 said: "We now have a tight shortage of the think tanks. One of the problems in our country is that we think that all the elites reside in the capital, while there are many elites who are working in the provinces while they are unknown although, they may have good ideas. We have to provide a platform to use their perspectives as well. Also, about the unsound competitive atmosphere, Interviewee 17 said: "Most universities are now working individually, that is, we cannot have group camping like those in the sports teams. Instructors should be shared between the universities. This is very important, for example, when there is a potential in a university of medical sciences, and there are good professors in the field of medical education. What is wrong with these professors who are used to prepare the students of the other universities of medical sciences?"

Improper test structure: The classes included in this theme were inappropriate test setups and improper design and application of the test. Interviewee 4 commented on the inadequacy of the test conditions as follows: There is a certain degree of imbalance between the teams, an

inequality. Some teams become stronger, some weaker, but they have tried to strike that balance as much as possible. Well, you cannot say it is 100 % successful, and there are still some differences. "Team projects are sometimes very intense. For example, it took 3-4 months, at least in our area. What I'm saying is that this really causes the student to miss his courses. I really decided not to participate anymore because of my course lessons this year."

Inappropriate Planning: Classes in this theme include the poor interfunctional cooperation, lack of the feedback mechanism, lack of the capable referees, poor information, and travel problems. About the poor interfunctional cooperation, Interviewee 3 said: "We had a theoretical-applied course, for example, we had a course of 3 credits including 2 theoretical and one applied credit. I asked them to give me time until July 30, instead of July 10, for my applied course so that, I can take part in the Olympiad. They told me: 'Why on earth are you taking part in the Olympiad? What are you going to show us?! What are you going to prove? They did not cooperate at all.'" Also, about the lack of feedback mechanism, Interviewee 18 said: "What happened during Olympiad this year? What was changed? Could we add anything to the general knowledge of the universities? Were there any achievements for the students? Are there any ways to make the Olympiad better? Should we manipulate the operational methods? Since we have not studied these issues, now we cannot say what can really be effective and what cannot?"

Table 1. Participants' demographic characteristic

No.	Participant	Post	Age	Sex	Work experience	Olympiad experience
1	Participant 1	Olympiad thinker	50	Male	18	2
2	Participant 2	Student	24	Female	-	4
3	Participant 3	Student	28	Female	-	3
4	Participant 4	Student	24	Male	-	4
5	Participant 5	Student	24	Male	-	3
6	Participant 6	Student	24	Female	1	3
7	Participant 7	Domain leader	46	Female	20	10
8	Participant 8	Domain leader	38	Male	10	2
9	Participant 9	Domain leader	45	Male	12	11
10	Participant 10	Question designer	62	Male	35	11
11	Participant 11	Question designer	57	Female	32	2
12	Participant 12	Olympiad Executive Expert	48	Female	24	8
13	Participant 13	Olympiad Executive Expert	24	Male	2	2
14	Participant 14	Olympiad Executive Expert	50	Female	22	6
15	Participant 16	Technical Committee	50	Male	20	2
16	Participant 17	Teacher	51	Male	19	3
17	Participant 19	Teacher	36	Male	10	2
18	Participant 18	Scientific Committee	62	Male	35	11
19	Participant 21	Head of Macro region	50	Female	22	5

Table 2. Details of the problems of the 11th Scientific Olympiad of Iranian Medical Students

Theme	Category	Subcategory
Forgetting the goals of the Olympiad	The non-generality of the Olympiad	The field of clinical reasoning allocate to medicine
		Professional Doctorate disciplines, apple of Olympiad eyes
		Restrictions on participation in the Olympiad by discipline and degree
	Centralism	Limited thinking room
		Tehran oriented Olympiad, beginning Discrimination
	Lack of accountability of officials	Lack of accountability of officials to exceptions
Irresponsibility of technical committee officials		
Unsound competitive	Competition, hinder the transfer of knowledge	

Theme	Category	Subcategory
	atmosphere	Malignant competition, Olympiad theme
Improper test structure	The inappropriateness of test setups	Lack of test time
		Delayed Start Time
		Improper arrangement of teams
		Delay in announcing results
		The inappropriateness of test resources
	Improper design and application of the test	Improper use of questions type
		Improper design of questions Poor design questions projects, dropping out of education Difficult
Inappropriate planning	Poor interfunctional cooperation	Lack of cooperation of the Executive Committee with the officials of the Olympiad in the universities
		Poor cooperation with Olympiad participants
	Lack of feedback mechanism	Lack of Olympiad information storage
		Program evaluation, the missing Olympiad link
	Lack of capable referee	The Olympiad referee, raraavis
		Unskilled referees, refereeing confusion
	Poor informing	Failure in the symbolic dimension of the Olympiad
		Failure to notify preparation classes
		Students unaware of the Olympiad
	Traveling problems	Difficult commuting in the final stage
		Difficult commuting in the preparation stage

DISCUSSION

This research aimed to explain the problems in the scientific Olympiad program of Iranian medical students and recommending some solutions based on the experience of the research team. According to the findings, three main themes were extracted: 1. Forgetting the goals of the Olympiad; 2. Improper test structure; and 3. Inappropriate planning. Each theme is discussed.

The non-generality of the Olympiad was one of the problems mentioned by the participants in the Scientific Olympiad program. For example, clinical reasoning is specific to the medical Olympiad, and other disciplines participating in the Olympiad cannot participate in this field. This restriction can cause unequal competition and consequently, dissatisfaction of the participants in the Olympiad. Hazrati et al.,^[8] also showed that one of the categories was non-generality, that is, the participants stated that the selected subjects were not general and only the students in the fields of medicine and pharmacy could handle these subjects. The findings are in line with the results of our study. Removing such restrictions (disciplines and education level) and paying equal attention to all the disciplines participating in the Olympiad can help solve this problem and bring the Olympiad closer to its goals.

Centralism was another class mentioned by the participants. Ghojzadeh et al., showed this problem in the form of uniform selection of the professors in their study^[9]. Different universities have their own potentials, capacities, facilities, and limitations. Failure to pay attention to this important issue will certainly cause the problems for the students' scientific Olympiad program and may lead to unequal competition and educational injustice. It is necessary to provide the ground for using all the potentials of different universities in the country and better planning for their use. Also, this problem can be solved to some extent by explaining these issues to the Olympiad officials

and reminding them of the goals and values of the Olympiad.

The lack of accountability of the officials was another class mentioned by the participants, which was shown in our study in the form of the irresponsibility of the ministry officials to the objections and lack of accountability of the officials in the technical committee. Hazrati et al., also pointed out the non-accountability of the authorities in their study (lack of accountability towards the objections), which is consistent with the findings of our study^[8]. Lack of accountability of the officials can cause dissatisfaction and consequently, the lack of motivation among the participants of the Olympiad as well as the reduction in the number of participants in the next Olympiads. Taking the responsibility by the Olympiad officials towards their requests and objections in a timely manner is the solution to this problem.

Many interviewees cited the unsound competitive atmosphere as another class of study in various ways. As can be seen in Table 2, competitiveness, barriers to the knowledge transfer and malignant competition are among the subclasses of an unsound competitive atmosphere. Also, Ghojzadeh et al., pointed out to the lack of scientific passion and healthy competition among the students, which is consistent with our study^[9]. Sometimes, in the field of competition, the goal becomes so valuable and unattainable that the individuals are willing to do anything to achieve it, and in this area, values may be forgotten and replaced by the anti-values, leading to the destructive or unsound competition. Constructing a panel of experts, reminding the Olympiad officials of its goals and governing values in different universities, removing the restrictions of the discipline and education level in some areas, holding a competition to motivate the learning, providing the incentives, such as additional prizes (for example, the funniest person, fairest person), preventing the humiliation of the losers and reducing the sensitivity of the competition

(for example, reducing or eliminating the scores of the winners) can be solutions to this problem.

The inappropriateness of test setups was another class emerged in our study, which is consistent with the results of the study by Hazrati et al.^[8]. They referred to the shortness of the test time, delays in announcing the results, and inadequacy of the test resources. Inappropriate test conditions can put a lot of stress on the test takers and influence the results of the Olympiad. Also, inappropriate arrangement of the teams diverts the Scientific Olympiad program from its goals. Better planning, for example, better selection of the test resources, better alignment of the teams, and justifying all the participants regarding the fact that the goal of the Olympiad is not a win-lose competition are the solutions to these problems.

Improper design and application of the test was another class emerged in this study as also mentioned in the studies by Ghojzadeh et al., Hazrati et al., and Nasrollahpour Shirvani^[5,8,9]. In these studies, authors referred to the inconsistencies between the resources and questions, designing some questions precisely from the books, lack of critical thinking and creativity in the questions, non-familiarity of the question designers with the nature of the test and ignorance of the competencies and experiences of the medical graduates, which were consistent with our study. Adibi et al., also pointed out the difficulty in designing the questions and Monajemi et al., mentioned the modifications of some of the Olympiad tests^[3,17]. In our study, inappropriate design of the questions in the areas of clinical reasoning, medical education, and entrepreneurship in the context of universities of the third millennium were observed. The students participating in the Olympiad also stated that the team projects are so difficult preventing them from doing their assignments at university and also doing their homework. Using the skilled question designers in different universities, using all the potentials of different universities, training, justifying the question designers and supporting them, e.g., giving scores to the academic researchers can solve this problem.

Poor interfunctional cooperation was another category of our study that was consistent with the findings of the study by Ghojzadeh et al. 2015^[9]. In their study, they also mentioned the interference with routine university programs and classes. Participants stated that the Olympiad preparation classes interfered with the routine classes of the university and that their instructors, especially clinicians did not have the necessary cooperation to participate in the Olympiad classes. Making the Olympiad a priority in the universities and seeking the expectations of each departments' head, holding regular meetings in the Secretariat of the Olympiad and continuously informing the officials in the universities, provision of the briefings by the Olympiad officials in the universities and university professors are some of the suggested solutions for this problem.

The lack of feedback mechanism was another category of this study. For example, one interviewee acknowledged that there is no database to record the Olympiad data and documents therefore; it would not be possible to track the Olympiads' participants in the future. Evaluation is an essential element of any program and also is needed for identification of the weaknesses, improving

and modifying the program, and making the decisions about what to do next. This feedback is also necessary to complete the previous steps of the educational aspect of the Olympiad^[29]. Adibi et al., proposed an annual and long-term evaluation of the Olympiad program after the first Olympiad^[3], but it seems that it has not yet been implemented after 11 years. Creating a database for recording the data and considering a program evaluation office in the permanent Secretariat of the Olympiad to evaluate the next Olympiads can be among the solutions to these problems.

The lack of capable referees was one of the classes observed in our study. Findings of our study showed that some Olympiad referees are not familiar with the refereeing process and do not have the necessary experience to judge the various stages of the Olympiad, and it is also difficult to find the experienced and capable referees for team projects and individual tests. One reason for this problem could be the low participation rate of the medical universities in the refereeing, as well as the limited number of the think tanks mentioned in the section on centralism. It seems that using the academic capacity of the universities across the country to judge and design the questions and to decentralize the program will solve this problem.

Poor informing was another class of our study. In their studies, Hazrati et al., Ghojzadeh et al., and Nasrollahpour Shirvani (2013, 2014) pointed out the poor informing that is consistent with the findings of our study^[8, 9, 15, 25]. They mentioned this problem in various ways, such as the lack of media coverage regarding the Olympiad and the lack of attention to the Olympiad, and poor informing about the Olympiad preparation classes. Here, inattention to the symbolic capital aspect of the Olympiad (like the Nobel Prize) was one of the most important sub-categories as mentioned by the key participants in this study. Seemingly, this important aspect has not been addressed like the student and sports Olympiads. Better informing about the Olympiad preparation classes, holding the meetings to justify the university professors about the goals of the Olympiad, informing the participants about the Olympiad through various means, especially television are some of the solutions to these problems.

Last but not the least is referred to the traveling problems. Hazrati et al., also mentioned the traveling problems of the students participating in the Olympiad at the national level, which is consistent with the findings of our study^[8]. More careful planning, holding the multi-level exams within the university, and allocating more funds for the Olympiad can alleviate this problem.

Despite many attempts to interview the experts, the lack of cooperation by some of them was one of the limitations of our study. In addition, the results of this study cannot be generalized to all the medical students and even subsequent Olympiads. On the other hand, performing the content analysis was one of our other limitations as it is often a time-consuming and costly activity, so it is recommended to use the quantitative and survey methods for such studies. Considering that in this study, only the problems of the Olympiad were addressed, it is suggested to conduct a study on the strengths of the Olympiad as well. Also, it is recommended to carry out a research on the

cost-effectiveness analysis of the Olympiad program due to the high cost and problems of holding the Olympiad.

CONCLUSION

Although, the Scientific Olympiad of the Medical Students is a useful program for the universities and participants and can cause the scientific exchanges between the universities and creating a process of teaching-learning and creativity in the students of the medical universities, but if it is not implemented properly and the problems of the courses are left untreated, it not only does not help the healthcare system, but also can impose a lot of costs on the system and is not cost-effective. It is necessary to re-emphasize the forgotten goals of the Olympiad, improve the test setups, especially at the team stage, and plan more carefully to better hold the Olympiad. The subjects of the Olympiad and the topics of each subject should be thoroughly specialized and the topics need to be determined according to the problem-solving approach for the current and future healthcare needs of the community. Also, decentralization of the Olympiad should be taken into account and the unsound competitive atmosphere existing in the Olympiad should be discouraged.

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