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The eleventh scientific Olympiad of Iranian medical students: Challenges and solutions

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Abstract:

BACKGROUND: The scientific Olympiad is an event that creates a competitive environment for student groups of medical universities across the country to solve problems that can help improve the health system. This study aims to explain the issues of the scientific Olympiad program of Iranian medical students.

MATERIALS AND METHODS: This study was conducted using content analysis method, and the data were collected through 21 semi-structured, in-depth interviews with experts from December 2018 to April 2020. Participants were selected using purposive sampling methods. Twenty-one students, domain leaders, question designers, Olympiad executive experts, and teachers (11 males and 10 females) participated in the interviews. 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, four themes, including inattention to context, inattention to input, inattention to process, and inattention to output, emerged.

CONCLUSIONS: The scientific Olympiad can lead to interuniversity scientific exchanges and paves the way for the promotion of education and evaluation of learners in medical universities, but if not correctly implemented and the problems of previous periods are not solved, it will not help the health system and can impose considerable costs on the system.

Keywords:

Academic competitions, content analysis, program evaluation, scientific Olympiad, students of medical sciences

Introduction

Scientific Olympiad is an event that provides a competitive space for student groups of the universities of medical sciences all over the country. This event is held aimed at solving the problems that can promote health in the country. The main goal of the national and international scientific Olympiads is to resolve the deficiencies of the education system. Therefore, scientific Olympiads seek to identify creative, innovative, and talented persons through exams and introduce

them to top educational, research, and professional centers; in this way, they will be provided with an opportunity to progress, which eventually serves the country's prosperity.^[1]

Motivational factors affect academic achievement significantly^[2] and scientific competition is one of the opportunities that can motivate students. Scientific Olympiad of medical students is a unique opportunity for the gathering of the country's elite students. Rather than a win/lose competition, it needs to be considered as an opportunity to cultivate students' capabilities. To do so, a new approach is required toward the scientific Olympiad beyond the common

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annual procedures.^[3,4] It is essential to pay attention to the factors involved in encouraging participation in the event and attendance of future Olympiads. However, the evidence reveals some problems in previous Olympiads.^[5] The experts mentioned the most serious obstacles to holding Olympiad as the lack of sufficient communication between the universities, lack of resources and facilities,^[6] low cooperation between type 2 and 3 universities (in planning, designing, and modifying the questions), and insufficient motivation (in both the faculty members and students). Moreover, the experts mentioned that the only incentive to participate is for the universities to achieve higher ranks with no innovation or creative project following the event.^[7]

On the other hand, students mentioned the following points as the inefficiencies of the Olympiad: lack of generality (medicine and pharmacy); lack of concordance between items and the proposed sources; deriving the questions from the exact text of the books; lack of Persian sources; repetitive questions; a large mass of proposals; lack of in-depth questions; similarity of the items to university exam rather than Olympiad; limited time to answer the questions in the Olympiad;^[5] evaluation of the memorized contents and inattention to higher level cognitive processes such as problem-solving skills and reasoning; the exclusiveness of clinical reasoning to medicine and exclusion of other disciplines such as nursing and dentistry; unfamiliarity with the concept of the usual exams, idiosyncratic scoring of the reviews, and paying more attention to individual exams rather than group exams. It should be mentioned that when a member of a university is present in the jury committee, there is less objection due to the students' familiarity with the correction process.^[8] Several studies have investigated the Olympiads held all over the world with each study focusing on a specific dimension of the Olympiads such as mission and performance, necessity, cost, achievements, obstacles and solutions, strengths and weaknesses, and students' attitudes. One of these studies has been performed by Oliver and Venville aimed to investigate the students' attitudes toward experimental sciences in the summer Olympiad camp. The research was conducted through a two-stage survey (the evaluators' survey and in-depth interviews) with 69 participants; it was a qualitative study performed based on a case-exploratory approach in 2011. The findings suggested the positive attitude of the students toward experimental sciences. The themes extracted in this study included immersion, development, emotions, inclusion, achievement, mastery, and identity.^[1]

Despite significant achievements of the last Olympiads, there are still many areas that need to be improved including continuous changes of policies and a heavy workload on the holders of such events, i.e., universities.

Resolving these issues can lead to the promotion both qualitatively and quantitatively.^[9] Based on the statements, the changes in the environmental conditions, and the experiences gained over a decade of holding Olympiads, and also regarding the necessity of maintaining Olympiads and paying attention to the quality of this procedure, it is necessary to revise it and address the weak points of scientific Olympiads, and also propose some solutions for achieving a better method. In this way, the problems and deficiencies can be identified, and the necessary measures can be taken to address them. Thus, the researchers decided to conduct a study aimed to address the problems in the scientific Olympiad program of 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. Twenty-one 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. The data were 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 min. 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 were 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, four major categories and 12 subcategories were identified. The reliability and validity of the research were ensured in terms of the four components of acceptability, transferability, consistency, and confirmability proposed by Lincoln and Guba.^[10]

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

Twenty-one participants, including students, Olympiad teachers, authorities, and scientific and technical committee members, participated in this study. The participants were 11 men and 10 women with bachelor's, master's, Ph.D., and professional doctorate degrees [Table 1]. The findings were reported as four themes and twelve categories [Table 2]. The main themes included inattention to context, inattention to input, inattention to process, and intention to output. In the following, each of the main themes and their categories is described by an example of the participants' statements.

Inattention to context

The categories belonging to this theme include inappropriate accommodation status, inappropriate nutritional status, lack of competent teacher, budget problems, and inappropriate planning. Participant 13 stated: "Universities cannot access competent teachers, i.e., there is no professor with the relevant specialty. There was no one in our university to be a master in this area; I think it was a weak point." Participant 12 addressed the budget problems: "One of the main problems is that the ministry does not allocate any budget to this Olympiad, and in the case of existence of any budget, only the top-ranking universities are

allocated a budget. However, this budget should be allocated to every university, and it is not a major cost for the ministry."

Inattention to input

The categories belonging to this theme include inappropriate preparation mechanisms and insufficient motivation of the participants. Participant 3 mentioned the inappropriate preparation mechanism: "Some of the students attended the event only because of getting a 10% positive score in screening exam; they proposed a translated paper that was quite nonsense." Participant 21 addressed the Olympiad solo classes: "Few students attended the event this year; they were ten people out of whom, only three students were selected; the small number of the attending students were one of the weak points."

Inattention to process

The categories for this theme include unfair competition, the bias in refereeing, inappropriate design, and administration of the test. Participant 21 addressed the unequal contest: "The referees come from big cities; in 90% of cases, the groups coming from the same cities as the referees can become successful." Participant 11 mentioned the inappropriate design and administration of the tests: "Students have different capabilities. Also, the questions are different, and in most cases, the reliability and validity of the questions are not checked."

Inattention to output

The categories include ignorance of the Olympiad consequences and the Restrictions on the horizon of the Olympiad. Participant 4 mentioned ignorance of the Olympiad consequences: "Our Olympiad projects are not properly used in the university; they may be only taught as a course after several years; that's all. I think in the past 4-5 years, not even a single project has been implemented in any university." Participant 18 addressed the restrictions on the horizon of the Olympiad: "Olympiad has become only a ladder for some of the students; I have seen some students who were not well aware of the Olympiad goal, and they only wanted to get a score. They do that in the hope of facilitating further education."

Discussion

This research aimed to explain the problems in the scientific Olympiad program of Iranian medical students and suggesting some solutions based on the experience of the research team. According to the findings, four main themes were extracted: (1) inattention to context; (2) inattention to input; (3) inattention to process; and (4) inattention to output. Each theme is discussed, and some solutions are proposed by team research.

Table 1: Participants' demographic characteristic

Number	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	-	2
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 15	Olympiad Executive Expert	54	Male	25	1
16	Participant 16	Technical Committee	50	Male	20	2
17	Participant 17	Teacher	51	Male	19	3
18	Participant 18	Teacher	48	Male	26	4
19	Participant 19	Teacher	46	Female	20	2
20	Participant 20	Technical manager	65	Female	37	11
21	Participant 21	Head of Macro region	50	Female	22	5

Inappropriate accommodation status (for example, distance from the place where the Olympiad is held) in different stages can affect the Olympiad results by interfering with the participants' sleep patterns, leading to a lower performance. A qualitative study performed by Hazrati *et al.*^[11] reported the dorm's status as one of the subcategories, i.e., the participants emphasized the necessity of appropriate accommodation either in the preparation phase or in the final stage. This finding is consistent with the results of our study.

Another factor mentioned by the participants was inappropriate nutritional status. This problem was observed in different stages, either in the preparation or in the final phases. In this regard, the results of the present study are inconsistent with the findings reported by Hazrati *et al.*^[9] The two mentioned problems can be solved by allocating more resources to Olympiads, avoiding budget waste, and better planning (for example, choosing a better place for holding the Olympiads).

Lack of competent teachers was another basic category mentioned by the participants. This problem was mainly observed in type 2 and 3 universities and areas such as interdisciplinary studies of humanities, health, and entrepreneurship in the Third Millennium universities. It seems that this problem is observed in the field of humanities because the teachers are selected out of the medical sciences universities. This problem in the area of entrepreneurship in the Third Millennium universities can be due to the lack of competent teachers in this field regarding its unique status. Training teachers in these

areas and providing them with Olympiad preparation webinars can solve this problem by decreasing unequal competitions.

Lack of budget for holding Olympiads and spending the budget on other areas was one of the main budget-related problems mentioned in this study. It can cause other issues such as nutrition, accommodation, and lack of support for the Olympiad teachers, referees, and exam designers. Ghojzadeh *et al.* addressed the problem of the lack of budget and resources; their findings are consistent with the results of the present study.^[12] This problem can be solved by the presence of sponsors, allocation of budget to Olympiad, and avoidance of budget waste.

Most participants mentioned inappropriate planning as the other category extracted in this research. As seen in Table 2, immediate decisions, the continuation of trial and error in holding the Olympiads, ineffective screening, and exhausting Olympiad were the subcategories of inappropriate planning. Ghojzadeh *et al.* mentioned the lack of improper preparation as an obstacle to holding the Olympiad, which is consistent with our study.^[12] The solutions proposed for this problem include forming an expert panel, receiving the viewpoints of Olympiad authorities in different universities after the annual Olympiads, and establishing an Olympiad evaluation office.

The other category derived in this research was inappropriate preparation mechanism. In this regard, the results are consistent with the findings reported by Hazrati *et al.* and Ghoujzadeh *et al.* (2015).^[11,12] The

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

Theme	Category	Subcategory	Meaning unit	
Inattention to context	Inappropriate accommodation status	Inappropriate accommodation status in the final stage	It was very hot in the dormitory, and very small, think about it, at first, they gave us a room for 4 people, but 6 people were crammed in it, and then they wanted to put two extra beds in the middle of the room. What a strange thing	
		Inappropriate accommodation status during the preparation phase	One of our classmates did not have a dormitory. She had a backpack, she is one day in one's house today, tomorrow she will be in another ones, she hesitates whether go back to their house or stay here. Especially boys, I hear a lot about their hard time with food, because the university was closed, I mean that they were very worried about providing their own food, and well, it's hard for them	
	Inappropriate nutritional status	Inappropriate nutritional status in the final stage	The food provided to the students was not qualified, the students were not very satisfied with this Olympiad. Unfortunately, the University of Iran does not thoroughly focus on this issue	
		Inappropriate nutritional status during the preparation phase	In addition, the entertainments provided by the hub for the Olympiad students, in my opinion, are not suitable for the student at all, it can be much better	
	Lack of competent teacher	A capable Olympiad teacher, a rare asset	Universities cannot access competent teachers; i.e., there is no professor with the relevant specialty. There was no one in our university to be a master in this area; I think it was a weak point	
		Uneducated teachers	We do not have a teacher in the country, we lack a trained teacher for this Olympiad in the country, because this is a new format of questioning and we lack trained ones for this job	
	Budget problems	Expenditure from the Olympiad accounts elsewhere	Independent the Olympiad accounts in the university	We can never spend the budget for the students themselves, our budget is spent on the faculty plane ticket, their food and luxury things!
			Unpaid arbitration	One of the main problems is that the ministry does not allocate any budget to this Olympiad, and in the case of existence of any budget, only the excellent universities are allocated a budget. However, this budget should be allocated to every university, and it is not a major cost for the ministry
		Inappropriate planning	ad hoc decisions	Here's a problem, when we want to invite someone, who would pay for his ticket? They say the university itself does. Who pays for the hotel? They don't know! That's why I do not want to invite anyone at all, because they may come at their own expense
	Continuation of trial and error in the Olympiad		For example, another thing that bothers me is the immediate decisions and changes, for example, that they individually add extra 40 minutes, or Mrs. professor does it for example, This is to my disadvantage, because I completed my sheet on time and this is not a good thing in that competitive atmosphere of the Olympiad	
Ineffective screening	I think they are still doing trial and error. That is some faculty members with some experience, sit down quickly and make decisions, and quickly announce the titles of ideas			
Inattention to input	Inappropriate preparation mechanism	Exhausting Olympiad	In a university, for example, even though it had a capacity for 3 people, only two people participated in the exam, which means that there are some universities with few students interested in participating! So it's a bit of a question as to whether or not the college screening test is useful or not	
		Haft Khan Coordination of classes in universities	Another problem is that they spend a lot of time, for example, the scientific committee gets bored, those who come from another city have to stay for many days, because I always have to come here to stay in Tehran myself. Being away is a little bit difficult for me, with all these works	
		Low quality virtual classes	Another issue is the coordination of these classes, especially in the last weeks, students really always need to take time for the Olympiad, then we need to make arrangements with the professors that, for example, a student does not come during the week, it is really very difficult	
		Inadequate training in preparation stage	Some of those webinars were not of such quality, the sound was problematic, the image was delayed	
			Some of the students attended the event only because of getting a 10% positive score in screening exam; they proposed a translated paper that was quite nonsense	

Contd...

Table 2: Contd...

Theme	Category	Subcategory	Meaning unit	
Insufficient motivation of the participants		Olympiad solo classes	Few students attended the event this year; they were ten people out of whom, only three students were selected; the few numbers of the attending students were one of the weak points	
		Low participation of teachers for training in the Olympiad	When we want to invite a professor, in some areas that we do not have a professor, it takes a lot of time, it requires a lot of coordination, many times professors do not come!	
		Lack of attachment of senior manager to the Olympiad	My personal feeling is that the senior management of medical sciences and the elites of the country still do not feel attached to this process! The Olympiad is still considered something additional! It is an attachment that even if you remove it, it seems that nothing has happened after 10 years!	
		Disinterest in the educational managers of the Olympiad	In the sports Olympiad where we put aside school, work and class at the service of these people! It is not fun, it is a serious issue, does anyone takes a brilliant talent certificate for the fun of it and give it such priority?	
		Unfair competition	The forgotten concept of the macro region	And when the students refer to the metropolitan area, again there are biases that exist by the university guiding these students, again this bias is toward their own students etc.
			Non-compliance with test principles by proctors	In fact, those attending as invigilator were not neutral people, invigilators should not be expert under any circumstances and should be completely unprofessional and neutral people
			Lack of security to keep questions	We went to the examination, when we got out, some candidates were saying that the scenario question was unclear to them. We followed up and found that they were students of another university. Then we found out that the scenario question was solved for them in the class. That is, they included that question and solved it
Bias in refereeing		Achieving the mentality of referees, designers, chances of victory	This year, in the field of clinical reasoning, they said that that university will be ranked first. Five days left to the exam we wondered how come? Let it alone that the corrector had told the students of that university about the subject of the exam 2 months beforehand	
		The referees of each university, shortlisted for medals	The referees come from the big cities; in 90% of cases, the groups coming from the same cities as the referees can become successful	
		double standard in judgement	For example, regarding the referees brought in for entrepreneurship, one of the concerns of the students was that some students were refereed by one group and some others were refereed by another group	
Inappropriate design and administration of the test		Improper judging of team projects	I think our referee checklist also has problems. We had to give a good score. Why? Because lots of scores are given to the students' presentation. Well, a student of a university can better present and talk and in a weaker university he can speak with more difficulty. What happens when the highest score is given to presentation? If one writes in the best way on paper, but fails to talk well, he fails	
		Lack of objectivity in judging	One of the biggest problems existing and really discouraging students, and in Tehran in the last days when the results are announced and everyone complains about is that the criterion for refereeing team projects are not really clear	
		Inattention to validity and reliability	Students have different capabilities. Also, the questions are different, and in most cases, the reliability and validity of the questions are not checked	
Inattention to output	Ignorance of the Olympiad consequences	The vague world of question design	Many of the questions were ambiguous	
		Designing questions, a complicated fact	Another issue is what set of methods to use? What kind of tests should we use?	
		Indeterminate Olympiad projects	I paid attention and found out that the projects that the students had worked so hard on were not mentioned and that what they were going to do with the project now, even again, these parts, I think what you say about the projects and what students do, not anymore, its continuation will end nowhere	
		The non-implementation of the Olympiad projects	Our Olympiad projects are not properly used in the university; they may be only taught as a course after several years; that's all. I think in the past 4-5 years, even one project has not been implemented in any university	
		No role of the Olympiad in the health system	How can we triple the number of tests per version? What is the best model for the referral implementation system in the country? What is the best model for implementing a family medicine system? Pathology of general courses, which one is addressed by the Olympiads?	
		Failure to represent the report card of the Olympiad, failure to create an educational role	If they provide transcripts to us, we know where we had problems, for example there was a problem in there, but when there are no transcripts, you cannot understand the positive and negative features of your work and your work remains without assessment and unfinished	

Contd...

Table 2: Contd...

Theme	Category	Subcategory	Meaning unit
	Restrictions on the horizon of the Olympiad	The goal, just the Olympiad holding	The Olympiad is not taken very seriously in the university also. While the great universities of the country might like to participate in scientific Olympiads, but there's no sufficient energy for a scientific competition
		Win a medal, the main goal of the Olympiad	Olympiad has become only a ladder for some of the students; I have seen some students who were not well aware of the Olympiad goal, and they only wanted to get a score. They do that hoping to facilitate continuing their education

preparation mechanism can affect the Olympiad results. The advantage of the current Olympiad compared to the events held in previous years was the webinar held for the preparation of the participants. However, the participants and the students in particular evaluated the quality of virtual classes at a low level, and they were dissatisfied with them. One of the subcategories of this category was the complicated process of matching the university course schedule with the Olympiad virtual classes and the participants reported that the virtual classes interfere with the university classes, and the teachers, especially the teachers of the clinical courses, do not duly cooperate in this matter. This problem can be solved by holding a meeting to inform the professors, encouraging more inter-sector cooperation, increasing the quality and quantity of the webinars, employing competent teachers, and training the Olympiad teachers.

The participants' insufficient motivation was another category the findings of which were consistent with the results reported by Ghोजazadeh *et al.*^[12] They also addressed a small number of students participating in the Olympiad and the teachers' low motivation. The limited participation in our study was not associated with the type of university as reported by the authorities of different kinds of universities. The students' low participation can be due to the improper information procedures in the universities, interference of the university courses with Olympiad classes, and the time-consuming nature of the Olympiad classes. The professors' low participation in teaching Olympiad courses can be due to the improper salary payment for Olympiad classes, the professors' intense workload, and their unfamiliarity with some of the Olympiad courses such as entrepreneurship and interdisciplinary studies. The solutions proposed for the mentioned problems include more intersector cooperation, decreasing the mass of Olympiad courses, on-time payment of the professors' salaries, and training the professors.

Unfair competition was another category emerged in this study. Hazrati *et al.* had also mentioned the proctors' lack of sufficient knowledge regarding exam protocols.^[11] In our study, the participants claimed that some of the referees and exam designers are the teachers of large universities or Olympiad courses. Thus, being test-wise, the participants can become aware of

the referees' tendencies and have a higher chance of winning the Olympiad. Furthermore, unfair competition leads to the participants' dissatisfaction and decreased participation. As seen in Table 2, the forgotten concept of macro-region is another subcategory. The participants frequently stated that the authorities of macro-region universities do not cooperate with the students of colleges. It seems that Olympiad had not fulfilled its main mission, i.e., encouraging scientific exchange among universities.^[13] The solutions proposed for this problem include restricting the teaching of Olympiad courses assigned to referees and designers; using the academic potential of universities all over the country for the positions of referee designing question items; briefing proctors and employing appropriate persons for this position; ensuring higher security level for the questions; the ministry holding meetings with macro universities to remind the mission of the Olympiad; and macro universities holding meetings with colleges.

Improper judgment of the team projects was one of the most important subcategories. The students and authorities frequently stated that team projects are not fairly judged in final stages, and the universities with a referee in the scientific committee of the Olympiad have greater chances to win a medal. One of the examples of lack of objective refereeing is interparent process of scoring the items of the refereeing form of team projects; this factor was mentioned by the Olympiad referees. The solutions proposed for this problem include making the refereeing form questions objective, maintaining higher balance in scoring the items, training the Olympiad referees, employing the elite referees, using the universities' capacity for refereeing, and selecting a refereeing team for the team projects.

The next category was inappropriate design and administration of the test; this category had been mentioned by Ghोजazadeh *et al.* and Hazrati *et al.*^[11,12] For example, they addressed the lack of concordance between the sources and questions, selection of the questions from the exact text of the books, lack of critical thinking and creativity in designing the questions, designers' unfamiliarity with the nature and ignorance of the medical graduates' experiences and skills; these findings are consistent with the results of our study. Monajemi *et al.* mentioned the necessity of some

Olympiad exams, and Adibi *et al.* stated the difficulty of question designing.^[3,14] The proposed solution is to employ skilled designers from different universities and provide them with promotion scores.

Ignorance of the consequences of Olympiad was the next category extracted in this study. The findings suggest that the Olympiad team projects are not utilized in different areas. These projects can have the minimum advantage of solving university-related problems. One of the relevant subcategories was the failure to present the Olympiad report card and failure to create an educational role that is consistent with the findings reported by Hazrati *et al.*^[11] This problem was frequently mentioned by the participants as one of the dissatisfaction factors, and a cause of ambiguity in evaluation. This feedback is necessary to complete the educational phase of the Olympiad.^[15] The solutions proposed for this problem include the presence of sponsors, increasing the Olympiad budget, the authorities' more attention to the proposed projects, and the presentation of the report card.

The last category, which is by no means the least, was the restrictions on the horizon of the Olympiad. The goal of most universities and participants is to win a medal which contradicts with the primary mission of the Olympiad, i.e., encouraging scientific exchange between the universities and teamwork. Although creating valuable motives can promote participation in Olympiad, it can also decrease the vitality of the Olympiad atmosphere by intensifying the competition among the participants.^[16] The proposed solutions include provoking internal motivation rather than external motivation, awarding all the participating teams, and briefing Olympiad authorities.

The limitations of the study included lack of cooperation by some experts despite many efforts to interview them. Furthermore, because Olympiad mostly belong to top-ranking students, the results cannot be generalized to all medical students and the subsequent Olympiad events. Content analysis is a time-consuming and costly process in most cases,^[14] which was another limitation of this study. As a result, it is suggested to carry out such studies through quantitative methods and surveys. As this study has only investigated the Olympiad problems, it is recommended to conduct further studies to investigate its strengths too.

Conclusions

Scientific student Olympiad is a useful program for the universities and participants, and it can provide the opportunity of scientific exchange among the universities, enhance education, and assess students in

universities of medical sciences. However, in the case of improper administration and failure to solve the problems of previous courses, Olympiads fail to help the health system and impose a high cost on this system. The findings suggested that there are several problems in the planning and execution of Olympiad. The authorities' attention to the solutions proposed in this study can improve subsequent Olympiad events.

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Conflict of interests

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