

Research Article



The Quality of Online Education for Theoretical Courses of Audiology from the Perspective of Audiology Students at Tehran University of Medical Sciences during the COVID-19 Pandemic

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Highlights

- Quality of elearning for theoretical courses is high in PhD students
- There is no difference between BSc and MSc students at the quality of elearning

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ABSTRACT

Background and Aim: The face-to-face education was suspended during the COVID-19 pandemic. In such situations, online education method was used. In this study, we aim to assess the quality of online education for theoretical courses of audiology from the perspective of audiology students at Tehran University of Medical Sciences (TUMS) during the COVID-19 pandemic.

Methods: This comparative cross-sectional study was conducted on 77 audiology students of the School of Rehabilitation at TUMS. Data collection were a demographic form and two quality and satisfaction assessment questionnaires. Statistical analysis was performed in SPSS version 17.

Results: There was a significant difference in all subscales of Shourchek questionnaire among students with different educational stages ($p < 0.05$), but there was no significant difference between age (except for social solidarity component) and gender ($p > 0.05$) groups. The results of Kruskal-Wallis test showed a statistically significant difference in the quality scores among students with different educational stages ($p = 0.033$), but there was no significant difference between age ($p = 0.300$) and gender ($p = 0.630$) groups.

Conclusion: The quality of online education for theoretical courses of audiology at TUMS is high from the perspective of PhD students, while it is low according to BSc and MSc students.

Keywords: Audiology; virtual education; COVID-19; pandemic; students

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Introduction

The Coronavirus disease 2019 (COVID-19) has infected more than 53 million people, causing 1.3 million deaths across the world [1]. The pandemic suddenly spread in Iran, and mostly affected the education system which disrupted the education of many students [1]. During this period, virtual learning can be helpful by taking into account the opinions and attitudes of its users. Educational programs, especially specialized medical programs should reflect the latest changes and growing demands of society and including the medical community. For this purpose, there is a need for the optimal use of virtual learning to provide learning conditions, although there are some concerns among medical students and teachers about this method such as impossibility of face-to-face interaction between the teacher and students, less control of the teacher over the students, and unfamiliarity of some teachers with the online educational systems. In recent years, a variety of learning theories and models have been presented [2]. By identifying different learning styles, appropriate suggestions and recommendations can be made for teachers and students regarding online education that can improve the learning process. For medical students, performance-based learning styles can be more successful. One of the most important advantages of virtual learning is the provision of educational services based on the students' needs, which makes it easy to personalize teaching regardless of time and place limitations [3].

Online education has become more popular worldwide with the spread of the COVID-19. So far, some studies have been conducted in this field which have examined online education in different levels and disciplines and has reported the disadvantages and advantages of this method from the perspective of students. For example, Farsi et al. conducted a study to measure the satisfaction of nursing students with online education at AJA University of Medical Sciences in Iran during the COVID-19 pandemic, and reported that most of students were satisfied with the quality of online education [4]. Chowdhury conducted a study in Bangladesh to examine whether using a virtual classroom could improve students' learning and performance in the classroom. They concluded that most students had positive comments on using a virtual classroom for learning [5]. Adnan and Anwar conducted a study in Pakistan during the COVID-19 pandemic and examined the attitudes of higher education students towards compulsory distance education. They reported that the teaching marketing online in underdeveloped countries such as Pakistan had no desired results [6]. Ac-

ademic fields of study with broader practical units have more problems with the online education compared to other fields of study. Levin et al. evaluated the effectiveness of online classrooms with the participation of 376 students of the School of Social Welfare in the United States. Their results showed that online classrooms were less effective [7].

With the COVID-19 pandemic, more studies on virtual learning should be conducted. Since there are scant research about the online education of audiology, this study aims to evaluate the quality of online education for theoretical courses of audiology from the perspective of audiology students of Tehran University of Medical Sciences during (TUMS) during the COVID-19 pandemic, we determined the attitude of audiology students to eliminate the shortcomings. In this study, the main purpose is to compare the scores of two questionnaires between audiology students in three stages. The hypothesis is that the overall score of bachelor (BSc), master (MSc), and PhD students in audiology is different.

Methods

Participants and data collection

This comparative cross-sectional study was conducted on 77 audiology students of Department of Audiology, School of Rehabilitation at TUMS in 2020-2021. Participants were first asked to complete a demographic form surveying information such as age, gender, educational level, educational status, and semester, after declaring their consent and being assured that their information would be kept confidential. Then, we used two questionnaires to assess online education for specific theoretical audiology courses. The first questionnaire was made to assess the quality of online education which had 13 items. The second questionnaire was used to evaluate the quality of online education of specific theoretical audiology courses, which had 34 items and seven subscales (success 4 questions, negative emotion 5 questions, teacher 5 questions, spontaneity in learning 5 questions, opportunity 5 questions, social solidarity 5 questions, overall satisfaction 5 questions). This questionnaire was developed by Shourcheh et al. [8]. The questions of both questionnaires along the questions related to the educational level and year of entering the university into the Porsline website (<https://porsline.com/>). After completing the designs of the online questionnaires, their links were sent to all participants. The quality assessment questionnaire was completed separately by the students for each specific theoretical course that the student had passed in the first semester of 2020-2021, and the second

questionnaire (Shourcheh's questionnaire) was completed once by the students in general for all these courses.

Statistical analysis

The descriptive statistics (mean and standard deviation) and statistical tests were used to analyze the collected data. Since the distribution of data was not normal, non-parametric Mann-Whitney U and Kruskal-Wallis tests were used to examine the difference between the scores of different subscales and the difference between the score of the questionnaires between students at different educational stages.

Results

The age of participants ranged from 19 to 55 years; 46 were female (59.7%) and 31 were male (40.3%); 52 (67.5%) BSc students, 15 (19.5%), were MSc students, and 10 (13%) were PhD students. The descriptive statistics for age and gender for students at three educational stages are summarized in [Table 1](#).

Descriptive statistics for all subscale scores of Shourcheh's questionnaire ([Table 2](#)) and course's questionnaire ([Table 3](#)) based on different educational stages are presented. The mean score of PhD students in all subscales of this questionnaire (except for the negative emotion subscale) was higher compared to the scores of other educational stages. The highest score in negative emotion subscale was rated by the MSc students ([Table 2](#)). The comparison of the subscale scores of this questionnaire among students showed a statistically significant difference among students with different educational stages ($p < 0.05$), but there was no significant difference between age groups (except for the social solidarity subscale) and gender groups ($p > 0.05$). To locate between which educational stages the statistical dif-

ference exists, Kruskal-Wallis test was used, whose results showed no significant difference between BSc and MSc students in subscales of success ($p = 0.804$), negative emotion ($p = 0.679$), teacher ($p = 0.634$), spontaneity ($p = 0.555$), time to re-study virtual courses ($p = 0.555$), social solidarity ($p = 0.350$), and overall satisfaction score ($p = 0.493$).

Quality assessment

The results of comparing the quality scores using Kruskal-Wallis test showed a statistically significant difference among students with different educational levels ($p = 0.033$), but there was no significant difference between age ($p = 0.300$) and gender ($p = 0.630$) groups. The results of the post hoc test showed a significant difference in the quality scores between MSc and PhD students ($p = 0.028$).

Discussion

In the last two years, with the spread of COVID-19 and the closure of universities, although there were shortcomings in online education, this method quickly replaced face-to-face methods throughout the country. In some previous studies, the results about online education has been satisfactory, while this learning method in other studies has not been reported appropriate and effective. This can be due to different reasons such as difference in students' field of study, level of education, and the country in which the study was conducted. We investigated the quality of online education and satisfaction with online education for theoretical courses of audiology according to the perspectives of students with different educational levels at TUMS during the pandemic in Iran. The effects of gender variable on both qualities of and satisfaction scores was also evaluated. The results showed the gender variable was not an effective factor

Table 1. Gender and age characteristics of participants by educational levels grouping

Level	Gender	No.(%)	Mean(SD)
			Age (y)
BSc	Male	29(55.8)	22.09(2.78)
	Female	23(44.2)	
MSc	Male	9(60)	25.46(3.27)
	Female	6(40)	
PhD	Male	8(80)	33.50(8.63)
	Female	2(20)	

Table 2. Mean score of the Shourchek's questionnaire for students with different educational program

Educational level	Statistic	Success	Negative emotion	Professor	Spontaneity	Opportunity	Social solidarity	Satisfaction
BSc	Mean(SD)	11.05(2.33)	13.01(3.32)	16.05(2.63)	13.11(2.82)	13.38(3.33)	14.34(2.87)	12.53(3.35)
	Median	11.00	13.00	16.00	13.00	14.00	15.00	13.00
	Min	4.00	6.00	10.00	7.00	5.00	5.00	5.00
	Max	16.00	20.00	20.00	20.00	20.00	20.00	20.00
MSc	Mean(SD)	10.46(2.38)	13.26(2.84)	14.80(3.42)	12.20(2.17)	11.60(2.99)	13.40(3.18)	12.40(3.73)
	Median	10.00	14.00	15.00	12.00	12.00	14.00	11.00
	Min	8.00	8.00	5.00	10.00	5.00	6.00	6.00
	Max	15.00	18.00	20.00	18.00	16.00	20.00	20.00
PhD	Mean(SD)	14.10(1.96)	7.80(3.45)	18.80(1.75)	16.70(2.98)	17.10(3.81)	17.60(2.63)	17.40(2.79)
	Median	14.50	6.50	20.00	17.50	19.00	18.50	18.00
	Min	11.00	5.00	16.00	13.00	9.00	14.00	14.00
	Max	16.00	15.00	20.00	20.00	20.00	20.00	20.00

for quality and satisfaction with online education. There was also no statistically significant difference among three age groups (<24 years, 25–30 years and >30 years) in the quality score, but a statistically significant difference was observed only in the social solidarity domain of the Shourchek's questionnaire. The effect of the quality of online education on the success of PhD students in audiology was higher than that on the BSc and MSc students. Saeedinejat and Vafaenajar reported that computer skills effectively correlated with the online education system and computerized test scores [9]. Aditya and Permadi concluded that the use of online education for higher education had a more significant impact on the success of students; the mean level of success between BSc and MSc students was similar. In addition, BSc and graduate students had less experience in computer skills and online educational systems [10].

In our study, the negative emotion subscale score was the same in BSc and graduate students in audiology, while it was lower in PhD students. BSc and MSc students had fewer experiences of virtual classes than PhD students. It was also difficult for them to communicate in the virtual environment. This may cause stress and anxiety among them and make them feel lonely and anxious in the classroom. The rate of negative emotions between BSc and MSc students in the study by Brooks and Young was also the same. One of the main reasons is the similar social experiences of the two groups and how they establish a useful relationship with the teacher [11]. Negative emotions reduce motivation in learning and increase students' negative experiences, which leads to academic failure [12]. Higher social interactions of PhD students compared to lower-level students make their communication with professors more purposeful. The high number of courses and teachers in BSc and MSc

Table 3. Descriptive statistics for score of course questionnaire at different educational program

Statistic	BSc	MSc	PhD
Mean(SD)	49.10(8.20)	44.73(6.81)	53.74(8.06)
Median	50.07	46.50	56.41
Min	28.71	33.00	37.60
Max	62.71	54.25	61.00

programs cause superficial communication of BSc and MSc students with teachers. Park and Ryu reported that teachers and students who had constructive interactions in the classroom had better self-confidence and positive emotions, resulting in their higher success [13].

PhD students in audiology had higher levels of spontaneity compared to BSc and graduate students, while BSc and MSc students were at the same level of spontaneity. Soleimani and Nadimi concluded that students' personality traits and teacher guidance can increase students' spontaneity [14].

PhD and BSc students had more time to re-study virtual course materials than MSc students. The MSc students (due to the shortness of the course, the high volume of lessons in each semester, and the tasks of preparing the thesis simultaneously) had not enough time to re-read virtual course materials. In PhD students in audiology, high social solidarity was reported which can be due to their strong relationship with classmates and professors. They have more academic, practical, and social experiences in university than BSc and MSc students. With more detailed planning and holding training classes to strengthen social relations and create a more flexible educational environment, the students' social solidarity and social relations can be improved [15].

Using the quality assessment questionnaire, the general needs and facilities available during the theoretical courses were virtually surveyed, and the audiology students' scores in virtual courses were evaluated. According to the results, PhD students had higher scores in this questionnaire than BSc and MSc students. This finding is consistent with the results of Noghan et al. They found no significant difference between BSc and MSc students in terms of satisfaction with online education. Based on their results, with the increase of educational levels, interest in the field of study increases [16]. Curriculum development, program evaluation, and assessment of students' academic achievement can affect students' willingness to attend classes, their attendance at class on time, and their homework performance [17].

Based on the results, it seems that, by the increase in the educational level, students' interest and satisfaction towards virtual learning and communication with teacher's increases. It is recommending that the quality of online education for other fields of study in other medical universities in Iran be examined and a comparison be made between the qualities of online education in two similar fields of study among medical universities in Iran. It is also better to evaluate the quality of online edu-

cation at different medical universities among students with the same field of study.

Conclusion

The quality of online education for theoretical courses of audiology in TUMS is high according to the perspectives of PhD students, while BSc and MSc students in audiology have the same attitude (low) towards the quality of online education for theoretical courses of audiology.

Ethical Considerations

Compliance with ethical guidelines

This study has been approved by Research Ethics Committees of School of Nursing and Midwifery & Rehabilitation Tehran University of Medical Sciences with approval ID IR.TUMS.FNM.REC. 1400.192.

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Authors' contributions

ZR: Study design, acquisition of data, interpretation of the results, statistical analysis, drafting the manuscript; SF: Study design, interpretation of the results, drafting the manuscript; FF: Study design, interpretation of the results, drafting the manuscript; NG: Interpretation of the results and drafting the manuscript; SJ: Statistical analysis, study design and pre interpretation.

Conflict of interest

The authors are responsible for all the statements in this work. Also, no conflicts of interest are to be declared.

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