ORIGINAL ARTICLE

## Evaluation and Comparison of the Effectiveness of an Online Grand Round between Audiology and Occupational Therapy Students of Ahvaz Jundishapur University of Medical Sciences during the COVID-19 Pandemic

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**Background:** This study conducted to explore and compare the effectiveness of an online ground round between two groups of audiology and occupational therapy of Ahvaz Jundishpaur University of Medical Sciences (AJUMS) students during the COVID-19 pandemic.

**Methods:** The study groups of this analytical cross-sectional study consisted of all fourth-year undergraduate students of audiology and occupational therapy. After implementation of the online grand round, the satisfaction questionnaire and knowledge exam were completed by the students.

**Results:** The level of satisfaction in both groups was above average (average>3); however, there was a significant difference in the mean total score of satisfaction questionnaire between the two groups (P=0.00). The mean score of the knowledge exam was 6.46±1.59 and 6.28±1.89 in the audiology and occupational therapy groups, respectively. However, there was no significant difference in the mean score of this exam between the two groups (P=0.78).

**Conclusion:** The online grand round can play an effective role in transferring the teacher's experiences to students during the COVID-19 pandemic, when it is not possible to hold face-to-face classes.

**Key words:** Ground Round, Online education, Satisfaction, COVID-19

## تقييم ومقارنة فعالية جولة كبرى عبر الإنترنت بين طلاب علم السمع والعلاج المهني في جامعة أهواز جنديشابور للعلوم الطبية خلال جائحة COVID-19

**الخلفية:** أجريت هذه الدراسة لاستكشاف ومقارنة فعالية جولة أرضية عبر الإنترنت بين مجموعتين من علم السمع و العلاج المهني لطلاب جامعة أهواز جنديشابور للعلوم الطبية (AJUMS) أثناء جائحة COVID-19 .

**الطرق:** تكونت مجموعات الدراسة في هذه الدراسة المقطعية التحليلية من جميع طلاب السنة الرابعة الجامعيين في علم السمع و العلاج الوظيفي. بعد تنفيذ الجولة الكبرى عبر الإنترنت ، تم إكمال استبيان الرضا واختبار المعرفة من قبل الطلاب.

**النتائج:** كان مستوى الرضا في كلا المجموعتين أعلى من المتوسط (متوسط< ٣) ؛ ومع ذلك ، كان هناك فرق كبير في متوسط الدرجة الإجمالية لاستبيان الرضا بين المجموعتين(P = 0.00) . كانت الدرجة المتوسطة لامتحان المعرفة 6.46±1.59 و 6.28±1.89 في مجموعتي السمع و العلاج الوظيفي على التوالي. و مع ذلك ، لم يكن هناك فرق كبير في متوسط درجات هذا الاختبار بين المجموعتين (P = 0.78).

**الخلاصة:** يمكن للجولة الكبرى عبر الإنترنت أن تلعب دورًا فعالاً في نقل تجارب المعلم إلى الطلاب أثناء جائحةCOVID-19 ، عندما لا يكون من الممكن عقد فصول دراسية وجهًا لوجه.

**الكلمات الأساسية:** الجولة الأرضية ، التعليم عبر الإنترنت ، الرضا ، COVID-19

## کوویڈ ۱۹ کے دوران آڈیالوجی اور آکوپیشنل تھراپی کے طلباء پر آن لائن گرینڈ راونڈ کے اثرات اور ان کا موازنہ نیز جائزہ ۔ یہ تحقیق جندی شاپور یونیورسٹی اھواز میں انجام دی گئي

**بیک گراونڈ:** یہ تحقیق کوویڈ ۱۹ کے دوران آڈیالوجی اور آکوپیشنل تھراپی کے طلباء پر آن لائن گرینڈ راونڈ کے اثرات اور ان کا موازنہ نیز جائزہ لینے کے لئے انجام دی گئي ہے۔ یہ تحقیق اھواز کی جندی شاپور میڈیکل یونیورسٹی میں انجام دی گئي ۔

**روش:** اس تحقیق میں شرکت کرنے والے طلباء کا تعلق جندی شاپور میڈیکل یونیورسٹی میں آڈیالوجی کے آخری سال کے طلبا اور آکوپیشنل تھراپی کے طلباء شامل تھے۔ آن لائن گرینڈ راونڈ پر عمل کرنے کے بعد دو سوالنامے دئے گئے جن کو دونوں گروہوں نے پر کیا ۔ ان سوالناموں میں حصول اطمینان اور نالج ٹسٹ پر سوالات تھے ۔

**نتیجے:** دونوں گروہ حصول اطمینان کے زمرے میں اوسط سے اوپر تھے تاہم دونوں گروہوں میں حصول اطمینان کے بارے میں اوسط نمبروں کے تعلق سے اعداد وشمار کا اختلاف دیکھا گیا ۔

**سفارش:** آن لائن گرینڈ راونڈ سے کوویڈ ۱۹ کے دوران چونکہ کلاسیں نہیں لگائي جاسکتی تھیں لھذا اس سے موثر طریقے پر اساتذہ نے اپنے طلباء کو معلومات اور ھدایات بہم پہنچائي ہیں ۔ اسی بنا پر اس کا استعمال ہونا چاہیے۔

**کلیدی الفاظ:** گرینڈ راونڈ ، آنلائن ، حصول اطمینان

## بررسی و مقایسه میزان اثر بخشی اجرای گرند راند آنلاین بین دانشجویان شنوایی شناسی و کاردرمانی دانشگاه علوم پزشکی جندی شاپور اهواز در دوران پاندمی بیماری کووید ۱۹

**زمینه و هدف:** این مطالعه با هدف بررسی و مقایسه میزان اثربخشی اجرای گرند راند آنلاین بر روی دو گروه از دانشجویان رشته های شنوایی شناسی و کاردرمانی دانشگاه جندی شاپور اهواز در دوران پاندمی بیماری کووید-۱۹ انجام شد.

**روش:** گروههای شرکت کننده در این مطالعه تحلیلی مقطعی را دانشجویان سال آخر مقطع کارشناسی رشته های شنوایی شناسی و کاردرمانی دانشگاه جندی شاپور اهواز تشکیل می دادند. پس از اجرای گرند راند انلاین، دو پرسشنامه رضایتمندی و آزمون سنجش دانش توسط دانشجویان هر دو گروه پر شدند.

**یافته ها:** سطح رضایتمندی در هر دو گروه بالای متوسط بود (بیشتر از ۳)، اما تفاوت آماری معناداری بین میانگین نمره کل پرسشنامه رضایتمندی بین دو گروه وجود داشت (p=0.00). میانگین نمره آزمون سنجش دانش در گروه شنوایی شناسی برابر با ۶,۴۶ با انحراف معیار ۱,۵۹ و در گروه کار درمانی برابر با ۶,۲۸ با انحراف معیار ۱,۸۹ بود. تفاوت آماری معناداری در میانگین نمره این آزمون بین هر دو گروه مورد بررسی دیده نشد (P=0.78).

**نتیجه گیری:** گرند راند آنلاین می تواند در دوران پاندمی کووید ۱۹ که امکان برگزاری کلاسهای حضوری وجود ندارد، نقش مؤثری در انتقال تجربیات استاد به دانشجو داشته باشد.

**واژه های کلیدی:** گرند راند، آموزش آنلاین، رضایتمندی، کووید ۱۹

## INTRODUCTION

Clinical education plays an important role in shaping the learner's professional competencies and allows them to apply their theoretical knowledge in practice. The purpose of clinical education is to achieve measurable changes in the students' performance of clinical tasks, as well as to motivate them to use creative thinking skills for solving problems. Considering the importance of clinical education in different fields of medical sciences, improving the quality of education requires proper management and active participation of teachers and students in clinical practices (1).

On the other hand, due to the COVID-19 pandemic and its effects on different aspects of life, including education, most medical universities have turned to online education as a new strategy to provide medical education, and online classes have become one of the common teaching methods (2,3). Therefore, attention to different methods of online education has become very important, and educational systems emphasize on the use of new and creative educational methods to improve creative thinking and decision-making abilities in students. Also, following the increased use of online education methods, development and improvement of educational skills have been highlighted (4). Meanwhile, rehabilitation sciences are no exception to this rule, and it is essential to present appropriate online educational methods to improve the quality of clinical education for students.

There are various clinical methods for medical education, including role playing, demonstration, question and answer, lecture, and grand rounds. The grand rounds are appropriate for teaching clinical subjects to students. During grand rounds, students and teachers are present at the patient's bedside and introduce, examine, and review the patient's medical records. The implementation of grand rounds has different dimensions, and careful planning and preparation are necessary (5). It should be noted that the main purpose of the grand rounds method is to rely on the knowledge of all instructors to properly transfer their experiences to students (6). In this method, students learn to apply their theoretical knowledge in practice (7). According to our search in medical databases, no study has been conducted so far to investigate the effect of grand rounds method in rehabilitation fields in Iran.

Because of the COVID-19 pandemic, it is not possible to hold face-to-face grand round meetings in various fields of rehabilitation sciences; therefore, online implementation can be effective in transferring the clinical experience and knowledge of teachers to students. For this purpose, we decided to design and implement an online grand round for students of rehabilitation sciences,

including audiology and occupational therapy. Since the final objective of any educational process depends on the knowledge transfer and satisfaction of learners, we evaluated this process using satisfaction questionnaire and assessed the knowledge of learners. Also, because of differences in the nature of audiology and occupational therapy learning methods, the final goal of the present study was to compare the results of these two groups.

## METHODS

In this analytical cross-sectional study, the census sampling method was applied. The study groups consisted of all fourth-year undergraduate students of audiology and occupational therapy at the Faculty of Rehabilitation of Ahvaz Jundishapur University of Medical Sciences (AJUMS), Ahvaz, Iran. Inclusion criteria was studying in audiology and occupational therapy field, in eight-semester degree, and exclusion criteria were incomplete answers to the questionnaire or not attending in the knowledge exam. Before starting the study, all students completed the consent forms. The Medical Ethics Committee of AJUMS approved the study protocol (IR. AJUMS.REC.1399.637), and the ethics committee principles were observed.

First, to implement an online grand round, a comprehensive search was conducted in various medical databases. Based on search results, the grand round was an effective method in education of medical students but there was no manuscript about implementation of grand round in audiology and occupational therapy field. Researcher made questionnaires were used in different articles for assessing students' satisfaction. Next, a meeting was scheduled in the audiology and occupational therapy departments to discuss how to implement the online grand round. According to the experts' opinions, we assessed the requirements of online grand rounds, using a researcher-made questionnaire. To determine the effectiveness of the online grand round and the students' satisfaction with this method, two other questionnaires were designed. For this purpose, two faculty members from both groups prepared five questions for the needs assessment questionnaire, fourteen questions for the satisfaction questionnaire, and ten questions for the knowledge assessment questionnaire.

To determine the content validity of the developed questionnaires, they were presented to ten faculty members of the audiology and occupational therapy departments of AJUMS. To determine the content validity ratio (CVR), the participants were asked to answer the questions as follows: "essential", "it is not essential, but helpful", and "not essential". All faculty members' answers were "essential". The CVR of all questions in the three questionnaires was measured to be one. The CVRs ranged from $-1$ (i.e., perfect disagreement) to $+1$ (i.e., perfect agreement) (8). CVRs above zero showed that more than half of the panel members agreed that an item was essential. Therefore, a CVR of one showed that the questions were prepared appropriately. To score the two questionnaires of needs assessment and satisfaction, a five-point Likert scale (very poor: one, poor: two, average: three, good: four, and very good: five) was used. The questions of the knowledge exam were designed based on a four-point scale (MCQ), the maximum exam score was 10, and the minimum score was 0.

The needs assessment questionnaire of online grand rounds was sent to the students. The necessity of online ground rounds was determined based on the students' responses (Table 1).

**Table 1. Mean scores of needs assessment questionnaire in two study groups (n=29)**

| Questions | Mean score | | | |
|---|---|---|---|---|
| | All students | Audiology | Occupational Therapy | P |
| How familiar are you with Ground Round? | 2.06 | 2.00 | 2.14 | 0.73 |
| How familiar are you with the difference between face-to-face and online Ground Round? | 1.93 | 2.00 | 1.85 | 0.20 |
| How necessary do you think it is to hold an online Ground Round? | 3.31 | 3.46 | 3.14 | 0.20 |
| To what extend do you think the online Ground Round can meet your clinical needs? | 3.10 | 3.13 | 3.07 | 0.91 |
| How effective do you think the online Ground Round can be in transferring your clinical knowledge and skills? | 3.17 | 3.20 | 3.14 | 0.25 |

Next, to schedule the online ground round, sessions were scheduled in each department to discuss the manner of implementation. Medical records, electrophysiological test, and intervention plan of rehabilitation for a patient with Meniere disease were discussed in the audiology filed. History, assessment of functional abilities and disabilities, mental health problems, and intervention plan were discussed in the occupational therapy filed for a client with stroke.

The online grand round was implemented in Adobe Connect (version: 2.6.9). The communication of instructors was viva video and microphone, but student's communication was only via microphone. The following steps were performed to implement the online grand round:

Sending instructions by Adobe Connect to students of both groups.

Audio-testing and checking the students and faculty members' access to microphones in Adobe Connect one day before the online grand round.

Implementing the online grand round on two different days for the two groups.

Completing the online satisfaction questionnaire by the two groups after implementing the online grand round.

Completing the knowledge assessment questionnaire online by the two groups at the end of the online grand round.

The central tendency and dispersion indices (mean and standard deviation) were measured to present descriptive data. After measuring the normality of data using Kolmogorov-Smirnov test, Mann-Whitney test was used to compare the results of the satisfaction questionnaire between the two groups. Also, to compare the results of the knowledge assessment questionnaire between the two groups, independent t-test was used. SPSS version 20.0 (IBM Corporation, New York, USA) was used for all statistical analyses, and the significance level for all tests was set at 0.05.

## RESULTS

A total of 29 students participated in this study (15 audiology students with the mean age of 23.40±0.63 years and 14 occupational therapy students with the mean age of 23.57±0.51 years). The results of the needs assessment questionnaire, which was completed by the students of both groups before the grand round, are shown in Table 1. The answers to the first two questions were very poor or poor, while the answers to the next three questions were scored high on average. According to the results of Table 1, the audiology group obtained a higher score in response to the third to fifth questions as compared to the occupational therapy group; however, the difference was not significant ($P>0.05$).

After implementing the online grand round, the two questionnaires of satisfaction and knowledge assessment were completed by the students in both groups. The mean total score of the satisfaction questionnaire in the audiology and occupational therapy groups was 4.12±0.27 and3.70±0.34, respectively. The level of satisfaction in both groups was above average; however, there was a significant difference in the mean total score of satisfaction questionnaire between the two groups ($P=0.00$). Table 2 presents the average scores of the satisfaction questionnaire in the two groups. Although both groups obtained an average score of three or higher on all items of the questionnaire, the level of satisfaction was not the same in the two groups for all items. In ten items, there was a significant difference in the satisfaction of students between the two groups, and in most items, the audiology students reported greater satisfaction as compared to the occupational therapy student.

**Table 2. Comparison of mean scores given to the satisfaction questionnaire between two study groups (n=29)**

| Questions | Mean score | | P |
|---|---|---|---|
| | Audiology | Occupational Therapy | |
| Announcing the online Ground Round was appropriate. | 4.40 | 4.07 | 1.46 |
| The purposes of the online Ground Round were mentioned clearly. | 4.26 | 3.28 | 0.00 |
| The length of the online Ground Round was appropriate. | 4.26 | 3.78 | 0.07 |

**Table 2. Continued.**

| Questions | Mean score | | P |
|---|---|---|---|
| | Audiology | Occupational Therapy | |
| The online Ground Round had an effective role on my clinical making decision. | 3.80 | 3.71 | 1.00 |
| The online Ground Round implementation was innovative. | 3.60 | 4.35 | 0.00 |
| The online Ground Round had a logical sequencing. | 4.33 | 4.21 | 0.59 |
| Students were actively participated in the online Ground Round. | 3.73 | 4.42 | 0.00 |
| The online Ground Round motivated students to learn. | 4.40 | 3.42 | 0.00 |
| During the online Ground Round, appropriate feedback was given to the students. | 4.26 | 3.57 | 0.01 |
| The online Ground Round could impact on the clinical knowledge improvement of the students. | 4.40 | 3.57 | 0.00 |
| The online Ground Round could impact on the clinical experience transferring. | 4.20 | 3.50 | 0.02 |
| The online Ground Round could impact on the clinical knowledge transferring. | 4.20 | 3.21 | 0.00 |
| The online Ground Round had a scientific credibility. | 4.46 | 3.64 | 0.00 |
| The online Ground Round' tools were convenient. | 3.40 | 3.14 | 0.86 |

Moreover, the mean score of the knowledge exam was 6.46±1.59 and 6.28±1.89 in the audiology and occupational therapy groups, respectively. Nevertheless, there was no significant difference in the mean score of this exam between the two groups (P=0.78).

## DISCUSSION

In this study, we aimed to design and implement a new method of online education for rehabilitation students.

Results of the present study showed that students' satisfaction level was 4.12±0.27 and 3.70±0.34, in the audiology and occupational therapy groups, respectively. The mean score of the knowledge exam was 6.46±1.59 and 6.28±1.89 in the audiology and occupational therapy groups, respectively. Satisfaction level and mean score of knowledge exam were in appropriate level. One of the important goals of medical universities is to train skilled specialists so that they can accurately diagnose and solve patients' problems (9). The COVID-19 pandemic has significantly influenced the process and quality of education in various fields of medical sciences and rehabilitation. Many university classes have been cancelled during the pandemic, and online education has become prominent. Therefore, it is important to manage this new educational system effectively and find appropriate strategies to achieve better outcomes in online education (10). Allen and Seaman in 2013 conducted a ten-year survey of online education in the United States and concluded that the use of online education is widespread and rapidly expanding. Universities and educational institutions are concentrating on online teaching methods as opposed to face-to-face learning in universities. They reported that in 77% of cases, the success of online classes was similar to face-to-face classes. However, it is very important to study the factors affecting the level of learners' satisfaction to improve online education (11).

In different educational methods used in different fields of medical education, including the grand rounds method, the simultaneous presence of the teacher and student in the clinical environment and discussions about the patients play an important role in the direct transfer of teacher's experiences to the learner (6, 7). On the other hand, the presence of the teacher and the student at the patient's bedside may increase the students' anxiety in response to questions asked by the teacher (12).

However, in the present study, since it was not possible for the student and teacher to be physically present at the patient's bedside simultaneously, we could reduce the learners' anxiety and increase their acceptance of the online grand rounds method. On the other hand, since online classes eliminate the teacher's physical presence, we must find new solutions so that learners can fill this gap to some extent. In this study, the online grand round was successful, as the learner could discuss the results of evaluation and treatment of a particular patient with the instructor. The present results indicated that rehabilitation students adapted to this online education method.

Since one of the key indicators of quality improvement in any educational system is the learner's satisfaction, the level of students' satisfaction was examined in this study. Overall, the students' satisfaction with an educational method should be examined in various dimensions, including implementation, timing, transfer of knowledge, and efficacy of methods used for transferring the teacher's experiences to students. In this regard, Cole et al., in a three-year study of students' satisfaction with e-learning, asked the students to rate their satisfaction with e-learning courses using a Likert scale. They used a web-based software program to review the students' responses over three years. They divided the participants into different groups, based on their degree and the number of courses they participated in. They concluded that the students were moderately satisfied with e-learning. Comfort or convenience was the most influential factor in the students' satisfaction, whereas lack of effective interactions with the teacher was considered as the most important factor

in dissatisfaction (13).

In the present study, the average score of satisfaction was achieved in both groups (average scores > three on all items in both groups); the use of Adobe Connect for implementing the online grand round had the lowest level of satisfaction. In the audiology group, the highest satisfaction scores were related to motivation and academic credibility, while in the occupational therapy group, the possibility of student's participation in the class and performance creativity had the highest satisfaction scores. Generally, in the audiology group, the level of satisfaction was higher than the occupational therapy group. In this regard, Dziuban et al. in 2015 examined the relationship between the learners' level of satisfaction with e-learning and their psychological presuppositions. They concluded that the psychological assumptions of the teacher and student play a significant role in the students' satisfaction with online education (14). The results presented in Table 1 show that occupational therapy students had less information about the differences between face-to-face and online grand rounds. Occupational therapy is a field where physical contact with the clients and communicating with them are very important, while audiology is more analysis-oriented, and the patient's presence is not essential for diagnosis. Therefore, it seems that the nature of these fields and the students' expectations of online education with respect to their clinical needs are different, and the performance of a group with a slightly higher score is not essentially superior.

Another approach to determine the effectiveness of an educational method is to measure the level of learners' knowledge after the end of the course. In 2015, Okhovati et al. conducted a study on the level of knowledge and attitude of students of Kerman University of Medical Sciences toward e-learning and found that their knowledge was at a moderate level, while their attitude was positive. Despite the positive attitude of these students, the researchers concluded that more activity is needed to improve the learners' knowledge of e-learning (15).

In the present study, the average score of knowledge exam was six to seven in both groups, which indicates the positive effect of the educational method on the learners' knowledge. Considering the students' desirable level of knowledge at the end of the online grand round, it seems that the knowledge and effectiveness of the online grand round improved in both groups. It is hoped that the online grand round, by improving the students' level of knowledge, can also help them with their clinical practice. The limitations of this program include the low speed of the Internet, the inadequacy of Adobe Connect, and the lack of video communication with the students.

Considering the mean scores of knowledge exam and students' satisfaction with the implementation of the online grand round, this method can play an effective role in transferring the teacher's experiences to students during the COVID-19 pandemic, when it is not possible to hold face-to-face classes. However, online education requires a suitable structure for implementation. It is suggested that future studies use online training software programs with a better performance, in addition to a greater Internet bandwidth. Also, it is recommended to perform several grand rounds in different medical fields to evaluate their effectiveness during the semester.

### Ethical considerations

Ethical issues including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc. have been completely observed by the authors. The ethics committee of Ahvaz Jundishpaur University of Medical Sciences approved this research, ethics code IR. AJUMS.REC.1399.637.

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