

Research Article



Effect of Gallery Walk Learning Strategy on Clinical Performance of Audiology Students Compared to Traditional Learning Strategy

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Highlights

- The Gallery walk impact on the clinical performance of students was explored
- We showed that gallery walk had a positive effect on learning
- Gallery walk could help students to promote their critical thinking

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ABSTRACT

Background and Aim: Gallery walk is an active learning strategy in form of discussion that enables students to be more active in learning process. This study aimed to evaluate the effect of this strategy on the clinical performance of audiology students.

Methods: In this quasi-experimental study, 30 fourth-year undergraduate students in audiology participated. They were assigned into two groups of traditional learning and gallery walk. The educational content of both groups was similar and was related to the adult care clinical practicum. The assessments included Eustachian tube function test, site-of-lesion tests, and clinical masking. The clinical knowledge, and satisfaction level of students were compared before and after intervention.

Results: Before the intervention, the difference in clinical knowledge was not statistically significant between the two study groups ($p>0.05$). After the intervention, we observed a considerable improvement in knowledge scores in both groups, mostly in the gallery walk group. The mean scores of site-of-lesion tests, and total score of knowledge were also significantly higher in the gallery walk group ($p<0.05$). The satisfaction level of students was above the average level (mean score= 3.9 ± 0.74).

Conclusion: The gallery walk strategy has more positive effects on clinical practice of audiology students compared to traditional learning strategy.

Keywords: Gallery walk; clinical education; audiology; satisfaction



Introduction

For better provision of health services, medical students need to be able to adapt themselves to the rapid change in medical knowledge and technological innovations. The current medical knowledge is not enough to have a proper role in the medical profession, and there is a need for improvement of clinical skills [1]. In recent years, the traditional strategies in medical education have been criticized for being teacher-centred strategies, and are not effective in promoting learning skills in clinical settings [2]. The most important benefit of teacher-centered strategies is the transfer of a large volume of information in a short time, but this method has many difficulties [3]. For example, they make students more passive during learning, and their confidence, motivation, and enthusiasm cannot be stimulated appropriately. They may have greater tendency towards rote learning and some of their abilities such as critical thinking, problem-solving, and effective communication with other students may be reduced [1-4].

Unlike traditional learning strategies, active learning strategies require the students to contribute to higher-order thinking activities; students may have greater role in controlling the learning process and take more responsibility for their own learning [4]. Recent studies have shown the increasing rate of active strategies in medical education [1-5]. Gallery walk is an active learning strategy that encourages students to have discussion at different stations using learning materials [5, 6]. This student-centred learning strategy enhances active participation in important scientific topics and writing medical reports. Medical instructors can use the gallery walk strategy to share their information with students [7, 8].

One of the most important learning material in audiology education is the clinical experience. Audiology students should learn how to assess, diagnose and manage the hearing disorders during different clinical rotations [9, 10]. Pure-tone audiometry is an essential test to determine the degree and type of hearing loss. In the clinical setting, masking of the non-test ear is necessary to determine the exact hearing thresholds in the presence of asymmetrical hearing loss or conductive hearing loss [11]. In clinical masking, students learn how to mask the non-test ear to avoid from interfering with the test-ear responses [10]. It has been suggested that behavioural audiological site-of-lesion tests such as tone decay test or short increment sensitivity index (SISI) are useful for differentiating between cochlear and auditory nerve lesions in patients with sensorineural hearing loss. Tests of

Eustachian tube function are also beneficial for diagnosing the absence/presence of Eustachian tube dysfunction and identifying the underlying causes [11]. Accurate performance and interpretation of the results of these clinical tests constitute an integral part of clinical education in audiology students [9, 10]. The present study aimed to compare the effect of traditional learning and gallery walk strategies in teaching clinical materials to audiology students.

Methods

Participants

In this quasi-experimental study, 30 fourth-year undergraduate students in audiology aged 22-26 years participated and were non-randomly assigned to traditional learning (n=15) and gallery walk (n=15) groups. The age and gender factors had no effect on the selection of study groups. Inclusion criterion was the eight-semester degree in audiology, and exclusion criteria were incomplete return of the questionnaire or not attending in the tests.

Interventions

In the current study, the students were first asked to present a topic related to the adult care clinical practicum and underwent Eustachian tube function tests (Valsalva maneuver and Toynbee maneuver), site-of-lesion tests (SISI, tone decay test, alternate binaural loudness balance test, reflex decay test, and Stenger test), and clinical masking assessments. Five sessions of adult care clinical practicum were assigned to the gallery walk strategy. Students in the gallery walk group were divided into five subgroups, and were given instruction on what they should do during the learning. The instructor encouraged all students to have same cooperation in the discussions. Five minutes allocated for staying at each station. Five wall posters (50×70 cm) illustrated the information about the audiological tests. One of the students from each group was selected to be the presenter and was asked to stay at his station and present the poster content. The instructor asked other students to move from one station to another and have discussions about the poster content at each station. For learning reinforcement of the audiological tests, the students were asked to move through the all stations twice. To encourage all students to be active in the learning process, the instructor asked different students to present the contents. This gave the presenter at the first station to have an opportunity to visit other stations. The traditional learning intervention was conducted in a clinical setting similar to that of the gallery walk group and using similar clinical contents presented by giving lecture.

Table 1. The demographic characteristics of study population

Variable	Educational strategy	
	Mean±SD/No. (%)	
	Traditional	Gallery walk
Age (years)	23.61±1.18	22.33±0.64
Sex	Male	4 (26.67%)
	Female	11 (72.33%)

All parameters are expressed as mean±standard deviation or percentages (%)

Measures

A 16-item questionnaire was developed to assess the knowledge of traditional learning and gallery walk strategies. For this purpose, 4, 8, 4 questions were designed for Eustachian tube function tests, site-of-lesion tests, and clinical masking assessments, respectively. In order to evaluate the level of satisfaction with the gallery walk strategy, a 10-item questionnaire was developed using a 5-point Likert scale (5=very good, 4=good, 3=moderate, 2=poor, 1=very poor). The need for the gallery walk strategy was measured using a 5-item questionnaire. Each item was scored on a 5-point Likert scale (5=extremely important, 4=very important, 3=moderately important, 2=slightly important, 1=not important). Content validity was calculated for both gallery walk need and satisfaction questionnaires. The final version of both questionnaires was distributed among nine audiologists who were the faculty members of different universities in Iran. The content validity index (CVI) was calculated according to Lawshe's approach. The acceptable value for the CVI index is ≥ 0.79 . Results reported that all questions had item CVI (I-CVI) values greater than 0.79

in terms of relevance, clarity, and simplicity. The calculated content validity ratio values for both questionnaire items were ≥ 0.8 . According to the results, all questionnaires had acceptable content validity.

Statistical analysis

All quantitative data were described as mean±standard deviation (SD). Independent sample t-test or Mann-Whitney U test were carried out to determine whether there was a statistical difference in the study variables between the two study groups. Levene's test was carried out to assess the equality of variances whose results reported the equality of variances. The statistical analyses were carried out in SPSS 17. (SPSS Inc. Chicago, Illinois, USA) The significance level was set at 0.05.

Results

Table 1 presents the demographic characteristics of participants. We found no significant differences between traditional learning and gallery walk groups in terms of students' age ($p > 0.05$). Table 2, presents the mean scores of need assessment for the gallery walk

Table 2. Mean need's assessment questionnaire scores for gallery walk strategy

Question	Mean±SD
	Scores
How much do you feel the need to implement this educational strategy to teach adult's clinical practicum topics for audiology students?	3.86±0.99
How much do you feel the need to implement this educational strategy to teach clinical masking topic for audiology students?	4.10±1.10
How much do you feel the need to implement this educational strategy to teach site of lesion tests topic for audiology students?	4.60±0.63
How much do you feel the need to implement this educational strategy to teach Eustachian tube tests topic for audiology students?	4.53±0.63
How much do you feel the need to implement this educational strategy to teach malingering tests topic for audiology students?	4.53±0.63
Total score	4.30±0.70

All parameters are expressed as mean±standard deviation

Table 3. Comparison of knowledge scores between study groups before educational intervention

Question domain	Educational strategy		95% confidence interval of difference	p
	Mean±SD			
	Traditional	Gallery walk		
Clinical masking	1.57±0.75	1.21±0.86	-0.25 - 0.99	0.229
Site of lesion tests	4.86±1.53	6.41±1.12	-2.97 - -0.09	0.051
Eustachian tube tests	1.61±10.51	1.66±0.48	-0.43 - 0.31	0.716
Total score	8.01±2.18	9.26±1.71	-3.01 - 0.47	0.146

All parameters are expressed as mean±standard deviation

Table 4. Comparison of knowledge scores between study groups after educational intervention

Question domain	Educational strategy		95% confidence interval of difference	p
	Mean±SD			
	Traditional	Gallery walk		
Clinical masking	2.25±0.56	2.44±0.73	-0.69 - 0.28	0.413
Site of lesion tests	6.83±1.53	8.63±1.24	-3.03 - 0.56	0.006
Eustachian tube tests	3.00±0.00	3.00±0.0	-	1.000
Total score	12.01±2.11	14.21±1.19	-3.28 - 0.71	0.003

All parameters are expressed as mean±standard deviation

strategy. As can be seen, students strongly expressed the need for this educational strategy for learning audiology. Answers to the first question were “moderately important” while the answers to the next four questions were “very important” in average. Based on the Likert scale, a score >3 was obtained in all questions.

At baseline, the differences in the means of site-of-lesion tests, Eustachian tube function test, clinical masking, and total score of knowledge assessment were not statistically significant between the two study groups ($p>0.05$) (Table 3). After the educational intervention, both groups showed a considerable improvement in all knowledge assessment domains (Table 4). This improve-

Table 5. Mean satisfaction scores for gallery walk strategy

Question	Mean±SD
Do you think that the gallery walk strategy is compatible with the clinical practicum syllabus in audiology?	3.73±0.78
Do you think that the contents of the gallery walk posters are important topics for adult’s clinical practicum issues in audiology?	3.73±0.77
Do you think that the gallery walk strategy is useful for recalling clinical practicum issues in audiology?	3.66±0.85
Do you think that the gallery walk strategy is based on appropriate reference?	3.93±0.84
Do you think that the gallery walk strategy motivates audiology students to learn clinical issues?	3.93±0.82
Do you think that the gallery walk strategy is an applicable educational strategy for all audiology students to learn clinical issues?	3.80±1.01
Does the teaching strategy of gallery walk help meet the clinical education needs of students?	3.93±0.92
Do you think that the gallery walk strategy is a scientifically valid educational strategy?	4.06±0.83
Do you think that the gallery walk strategy is an innovative educational strategy?	3.93±0.91
Do you think that the gallery walk strategy improves your awareness of the theoretical contents in audiology?	4.21±0.82
Total score	3.91±0.74

ment was more in the gallery walk group. The mean score of site-of-lesion tests and total score of knowledge assessment were also significantly higher in this group ($p < 0.05$). Table 5 presents the mean scores of satisfaction with the gallery walk strategy. All items of this questionnaire had acceptable scores.

Discussion

The ultimate goal of any educational strategy in clinical setting is to help students to accurately diagnose and solve patients' problems [3, 10]. The findings of the present study revealed that audiology students showed clinical knowledge improvement following the educational intervention by traditional learning or gallery walk learning strategies, where the improvement was higher in the gallery walk group. The gallery walk is an active discussion technique that gets students out of their chairs and into a mode of more active participation. It makes them think and discuss together. In fact, the gallery walk strategy can stimulate communication among students and promote their critical thinking [5]. It has also been indicated that classroom management, student engagement, and student responsibility also can be improved by gallery walk strategy [7].

Several studies have demonstrated that the gallery walk strategy can enhance the students' understanding of the teaching topics in a more pleasurable learning environment [5, 7, 12]. Furthermore, the simultaneous presence of the teacher and student in a clinical setting and discussions about the visited patients can better transfer the teacher's experiences to the students [13]. Gallery walk strategy uses pictures, images, or flowcharts to improve the understanding and performance of students [7]. The use of visual charts of some clinical topics and some tests during the clinical practicum course can reduce students' errors and they can retain educational content better [14]. Nourozi et al. showed that the use of auxiliary equipment and training videos are very helpful in improving students' practical skills, and can be used along with the traditional learning strategy in practical endodontic training [15]. Sharifdini et al. compared the gallery walk and traditional learning strategies in pharmacy students and found that the gallery walk method had a significant impact on enhancing students' knowledge and recommended the implementation of this educational strategy in pharmacy schools [16].

It seems that gallery walk has a positive impact on students' interests [5, 7]. According to Dinata and Anggraini, the gallery walk strategy can encourage students to communicate and share ideas with their classmates rather than just listening

to the instructor. It can stimulate and enhance the students' cognitive skills during assessment, analysis, and synthesis. They also suggested that the gallery walk strategy provides an opportunity for students to move around their educational environment, attract attentions, and stimulate their interest in learning more about a predetermined topic [17]. Mokhtari et al. evaluated the effect of watching educational videos in dental students and reported that the students were highly satisfied in visual mode [18]. In the present study, the acceptable level of satisfaction was reported by the audiology students. Krouse findings indicated that visual modelling can have a positive effect on reducing anxiety, and on clinical practice to facilitate knowledge acquisition and improve self-care [19]. Therefore, the learning strategies such as gallery walk that integrates visual and verbal aspects and engages students in a more active learning manner, can lead to higher information retention and transfer.

Conclusion

The gallery walk learning strategy is useful in the learning process of audiology students. The use of this method along with traditional learning strategies can help audiology students to better diagnose and solve patients' problems to promote their critical thinking, class discussion, cooperative learning, and team building.

Ethical Considerations

Compliance with ethical guidelines

All students signed an informed consent form approved by the local Ethics Committee (registration code: IR.AJUMS.REC.1400.230).

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Authors' contributions

FT: Study design, acquisition of data, interpretation of the results; AB: Statistical analysis, drafting the manuscript; NM: Study design; MT: Acquisition of data; MD: Statistical analysis; SSS: Acquisition of data; MA: Study design, interpretation of the results, drafting the manuscript, revision the manuscript

Conflict of interest

The authors declare that there is no conflict of interest to be reported.

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