

Research Article

Learning outcomes and perceptions of midwifery students about peer-teaching and lecture method in gynecology and infertility course

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This study was conducted to compare teaching gynecology and infertility courses with both lecture and peer methods. In 2018, a quasi-experimental study was designed at the midwifery department of a state university in Iran. A total of 32 midwifery students were participated in the study. During the first eight sessions, 50% of the course content was taught in the form of same-level peer – teaching. The last eight sessions of the course were taught by lecture. At the end of each session, students were given a post-test, also midterm and final exam. At the end of exams, each student was asked to complete a questionnaire assessing students' perception about teaching methods. The average mid- term exam score for peer – teaching (34.5 ± 5.5) was significantly ($p < 0.01$) higher than the lecture method (30.4 ± 5.8), as well as average final exam score (7.2 ± 1.5 vs. 5.8 ± 1.6). The average overall student perception score for the peer – teaching method was significantly ($p < 0.01$) higher than the corresponding score for the lecture method (86.8 ± 11.5 vs. 74.1 ± 12.4). Using the peer education as a complementary method in teaching theoretical courses along with the traditional lecture method seems to be appropriate.

Keywords: Feedback; Feedback choice; Active learning; Academic development; Pedagogy

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1. Introduction

Education is vital for social, political and economic development and effective teaching is crucial for the success of any educational system. Learning depends on the integration between student's preferential learning method and the teacher's teaching style. For effective learning to take place, an appropriate teaching method must be adopted. In order to be effective, a particular teaching method needs to take into account the characteristic of the learner, type of learning, and the nature of the subject matter.

Traditional teaching methods are one-dimensional educational approaches where educator is the sole provider of knowledge. In modern or active teaching methods, learners are actively involved in learning process and educator role is to ease the process of learning and develop

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cognitive, emotional and learning characteristics of the learners. It is a collaborative student-centered activity, where students work on assignments or projects in group, in pursuit of effective teamwork and individual responsibility (Issenberg et al., 2005).

The concept of peer learning can be traced back to the time of Aristotle. Defined by Topping (1996) as “people from similar social groupings who are not professional teachers helping each other to learn and learning themselves by teaching”, peer assisted learning can provide extra support for students. The theoretical underpinning of peer teaching programmes is drawn from Topping’s theoretical model of peer and socio-cultural theories of learning (Topping 1988). These theories conceptualize learning through participation in social interaction and activity within cultural and historical contexts (Chan et al, 2016). Peer tutoring programs have been practiced across diverse tutoring formats based on age, knowledge gap between participants and the nature of their roles (Roscoe & Chi, 2007). A number of different peer teaching methods have been described. Same-level or same class equal status; learners from the same class or year all act as tutors and learners. Same-level or same class unequal status; learners may be selected to assume the role of tutor on the basis of their higher level of skills and/or academic attainment. Cross-level or near-peer teaching involving a single institution; encompasses a certain hierarchy based on varying educational levels. for example, second- or third-year undergraduates tutoring first-year students and Cross-level peer tutoring, involving two institutions (Seema&Syeda, 2014).

Teaching by peers increasingly being used in medical science discipline (Krych et al., 2005; Burgess & Nestel, 2014), with many advantages including higher self-esteem, improvement in psycho-movement, cognitive skills, oral presentation skills, teamwork, decision making, accountability, critical thinking, and test scores without the imposition of additional costs for the educational institution (Secomb, 2008). Peer assisted learning has been adopted for student learning in the fields of nursing education (Stone, et al., 2013). Several studies have reported positive effect on students’ outcomes in post-tutorial physiology and anatomy examination scores (Jackson & Evans, 2012; Manyama et al., 2016 ;Zarifnejad et al., 2018). Furthermore, some studies have reported that students perceive peer teaching favorably and wanted peer teaching to be adopted as part of courses (Glynn et al., 2006; Srivastava et al., 2015).

In Iran, peer teaching studies have been conducted in AIDS prevention, breast self-examination, sexual function and nutrition (Azizi et al., 2008; Akbarzadeh et al., 2009; NooriSistani et al., 2010; MorowatiSharifabad et al., 2012), as well as training nursing, dentistry and medical students, especially in clinical settings (Haji-Hosseini et al., 2013; Kimyai et al., 2011). Its positive impact on the academic performance has been reported (Field, et al., 2007; Buckley & Zamora, 2007; Roshan et al., 2005). However, its application in midwifery teaching especially teaching of specialized courses has not been studied. Gynecology and infertility courses are essential for midwifery students and their future careers. These courses provide midwifery students with knowledge on how to provide care, information and support to women regarding their overall reproductive health and treatments for infertility and other gynecological problems. Given the necessity of active learning methods promotion, this study was conducted to compare teaching gynecology and infertility courses with both lecture and peer methods.

2. Method

2.1. Research Design

In 2016, a quasi-experimental study was designed at the midwifery department of Medical Sciences in a state university. Quasi-experimental designs often described as nonrandomized, pre-post intervention studies, are common in the medical discipline and used to evaluate the effectiveness of a treatment, a type of psychotherapy or an educational intervention (Harris et al., 2006).

2.2. Participants

All students (32) enrolled in the gynecology and infertility course accepted the invitation to participate in the study. The average age of participants was 21.8, with minimum and maximum of 21 and 25 years. All participants were female, and their last semester grade average was 15.5 with a minimum of 14 and a maximum of 17.4. Minimum and maximum scores in the questionnaire were 24 and 120, respectively. The exclusion criterion was excessive student absence and reluctance to participate in the research.

2.3. Intervention and Process

Participants were informed about objectives and methodology of the study, and written consents were obtained from them. The curriculum including educational objectives, resources, and timetable for topics was provided by the lecturer and explained in detail to the students. Participants were not randomly assigned to conditions or groups, instead all students of the same class were involved in two methods of education in different times. Taking such steps would increase the internal validity of the study because it would eliminate some of the most important confounding variables in comparison of dividing them in two group.

During the first eight sessions, 50% of the course content were taught in the form of same-level or same class equal status peer teaching. To engage students, they were divided into 6 groups based on total number of students and their affinity and each group participated in the teaching content of one session. Members in each group were required to use various active methods to teach, based on their interests and opinions. Proposed methods were: role play, case reporting, group discussion, question and answer, PowerPoint slides, video clips and short educational materials, simulation of clinical environments, using educational pamphlets, laboratory environments and skill labs for the lessons. The classroom was prepared, and chairs were arranged in a semicircle form to increase interaction, comprehension and concentration.

In order to implement these methods, students were trained before the start of the experiment outside classroom hours by faculty, and groups were involved in practice with each other. Students were also held practices in gynecology ward and educational clinic to become familiarized with subjects in clinical setting and with clinical education instructors. To encourage students to become active and attend to their interests, two scores of the total final evaluation score was devoted to teaching and students activities. Faculty had an active presence in the classroom during training sessions, supervised teaching, intervened as needed and responded to questions that peers had failed to comprehend fully. At the end of each session, students were given a post-test and after the end of sessions they were given final exam.

The last eight sessions of the course were taught by lecture method using PowerPoint slides while maintaining teaching principles and instructions to improve teaching quality (asking questions to increase student attention, giving examples, making conclusions and outlines). Like peer teaching method, at the end of each session, students were given a post-test and at the end they were given final exam.

2.4. Data Collection

Both exams included 41 quadruple questions (with one score for each question), 8 matching questions (with a score of 0.25 for each question) and four short answer questions (with a score of one for each question). Total score was 47. The pass score was half of the total score in both final exams. Selected questions covered lessons contents, degrees of difficulties and learning levels. At the end of exams, each student was asked to complete a questionnaire assessing her perception about teaching methods. Student perception assessment tool was a 24-item researcher-made questionnaire covering four domains: interest and encouraging participation (8 questions); rules of teaching and learning (10 questions); exam and evaluation (4 questions) and appropriateness of the teaching method and continuity (2 questions).

A five-point Likert type rating scale with options ranging from very little to very much (1-5), was used for assessment of students' perceptions about their learning experience in both Lecture and peer teaching method. The total questionnaire scores were computed by adding the scores for all items. In order to compare both methods, participants were asked to complete the questionnaire by the scale of choosing three options (lecture, peer and none). Content validity method was used to evaluate validity of the questionnaire, where a panel of five experts (faculty members) confirmed that questions contain the desired objectives and contents. The reliability of the questionnaire was established by Test-retest correlation. The Cronbach's alpha coefficient for the same questionnaire which were completed by 8 students at the beginning and ten days later was 0.89. All ethical principles were observed, and the framework was approved by the Ethics Committee of the Yasuj University of Medical Sciences.

2.6. Data Analysis

Data analysis was performed using SPSS version 22. Paired sample t-test was used for the mean score difference between two teaching methods. A p value less than 0.05 was considered statistically significant.

3. Results

The average exam and post-test scores for peer teaching were significantly greater than corresponding scores for lecture teaching (Table 1). The average perception scores for all domains were greater for peer teaching than the corresponding scores for lecture teaching, but the differences were not significant, except in the Creating interest and encouraging participation and the exam and evaluation domains (Table 2). The total students perception score for peer teaching method was significantly greater than lecture method.

Table 1

Mean \pm standard deviation and significance level of student learning in peer and lecture teaching

Variable	Peer	Lecture	p
	Mean \pm s .d.		
Exam score	34.5 \pm 5.5	30.4 \pm 5.8	< .01
Post-test score	7.2 \pm 1.5	5.8 \pm 1.6	< .01

Table 2

Mean \pm standard deviation and significance level of student perception in peer and lecture teaching

Domain	Lecture	Peer	p
	Mean \pm SD		
Creating interest and encouraging participation	22.0 \pm 5.4	29.9 \pm 4.4	< .01
Teaching and learning rules	35.5 \pm 5.8	37.0 \pm 5.1	< .30
Exam & evaluation	10.6 \pm 2.5	12.8 \pm 1.7	< .01
Teaching appropriateness and continuity	6.0 \pm 2.0	7.1 \pm 1.8	< .06
Global rating	74.1 \pm 12.4	86.7 \pm 11.5	< .01

Number and percentage of observations for the student perception is presented in Table 3. In the domain of creating interest and encouraging participation in learning, on average 14% of students chose the lecture method, 71% chose the peer method and 15% found no difference between peer and lecture methods. In the domain of observing principles and rules of teaching and learning, 30.7% of students chose lecture, 40. 5% chose peer teaching and 28.8% found no difference. In the domain of test and evaluation of content, 28.2% of students chose lecture method, 49% chose peer teaching as the best method and 22.8% had no choice. In the domain of the appropriateness of the teaching method and its continued use, 14% of students chose lecture method, 65.6% chose peer and 20.4% did not choose either of them. In general, on average 56.3% of

students chose the peer teaching method, 21.9% chose the lecture method and for 21.9% both choices were no different.

Table 3

Number and percentage of observations for the student perception in favor of lecture teaching, peer teaching and treating both methods equally

Statement	Lecture Number (%)	Peer	Equal
Creating interest and encouraging participation			
Cheerful & enjoyable	3 (9.4)	27 (84.4)	2 (6.2)
Motivation & interest	3 (9.4)	27 (84.4)	2 (6.2)
Diverse training	1 (3.1)	30 (93.8)	1(3.1)
Student participation	1 (3.1)	25 (75.8)	6 (18.8)
Communication skill	4 (12.1)	26 (78.8)	2 (6.3)
Decrease monotony & fatigue	6 (18.8)	22 (66.7)	4 (12.1)
Encourage multiple resource use	11 (34.4)	13 (40.6)	8 (25.0)
Better preparation for clinic	7 (21.9)	16 (50.0)	9 (28.1)
Teaching & learning rule			
Clear explanation	2 (6.3)	23 (69.7)	7 (21.9)
Deep learning	2 (6.3)	20 (62.5)	10 (31.3)
Expression of introduction	13 (40.6)	9 (28.1)	10 (31.3)
Teacher proficiency & skill	18 (56.3)	9 (28.1)	5 (15.6)
Classroom schedule	13 (40.6)	11 (34.4)	8 (25)
Effective relationship	9 (28.1)	18 (56.3)	5 (15.6)
Teacher interest & motivation	4 (12.5)	16 (50.0)	12 (37.5)
Teaching difficulty & time consumption	12 (37.5)	9 (28.1)	11(34.4)
Classroom management	13 (40.6)	9 (28.1)	10 (31.3)
Summation of the course content	12 (37.5)	6 (18.8)	14 (43.8)
Exam & evaluation			
Exam preparation	10 (31.3)	11 (34.4)	11 (34.4)
Exam stressfulness	7 (21.9)	18 (56.3)	7 (21.9)
Exam readiness	5 (15.6)	22 (68.8)	5 (15.6)
Exam satisfaction	3 (9.4)	23 (69.7)	6 (18.8)
Teaching method appropriateness &continuity			
Teaching gynecology	6 (18.8)	20 (62.5)	6 (18.8)
Teaching other courses	3 (9.4)	22 (68.8)	7 (21.9)

4. Discussion

Learning measured by the average mid-term exam score, was significantly ($p < .01$) greater for the peer teaching method than the lecture method. Learning measured by the average post-tests score at the end of each session, showed a significant ($p < .01$) difference in favor of the peer method (Table 1). These results are consistent with the other studies, including Eslami et al. (2015) in physiopathology course, Motevaselian&Nassiri (2014) in nursing students dressing skill and Almasi et al. (2014), where average assisted learning (PAL) scores of peer group in both mid-term and final exams were higher than those of the lecture method for medical student limb anatomy course.

A review of nine studies by Adib-Hajbaghery and Motaharian (2016) on the outcomes of near-peer education for medical sciences students, did not find any significant difference between the intervention and control groups. In a near peer teaching program, average scores in three out of five domains of final test of physiology of blood, respiration and heart courses were improved in comparison with the previous period (Jackson and Evans, 2012).

In the study of Blank et al. (2013) the final grade of the control group in physical examination of medical students, was significantly lower than that of the peer teaching group. Although the design of these studies (Adib-Hajbaghery & Motaharian, 2016; Jackson & Evans, 2012; Blank et al., 2013) were different from our study (Same-level or same class equal status peer teaching), they all claim that peer education can be more effective in term of student learning than lecture. Cortright et al. (2005) reported that active learning improved students participation in class, increased their interaction with each other and with the instructor, enhanced their exam performance and their meaningful learning persisted longer.

Several studies which have compared other active learning methods, such as problem solving, group discussion, conceptual mapping and collaborative approaches, have shown similar results (Safari, et al., 2006; MoradiDirin et al., 2013; Rahmani et al., 2007; Mahram et al., 2009; Sadeghi et al., 2014; Ghasemzadeh et al., 2015). Learners who communicated, cooperated and collaborated in groups, increased their understanding and thereafter, achieved higher scores. However, findings from two studies (House et al., 2017; Büscher et al., 2013) on the effectiveness of peer teaching were not consistent with the finding of our study.

The total perception score for peer teaching was significantly higher than lecture method and the fact that average score in all four domains were higher for the peer method suggests that students perceived all aspects of their learning experience by peer teaching more favorable than the lecture method (Table 2). However, this difference was only significant ($p < .05$) in the domains of creating interest and encouraging participation and exam and evaluation. Most students assessed the peer teaching approach more favorably in all four domains, especially for the statement of the cheerful and enjoyable, creating motivation and interest, diverse training, student participation, communication skill, decreasing monotony and fatigue, Clear explanation, deep learning, exam readiness, exam satisfaction and appropriateness for teaching gynecology and other courses (Table 3). In Gottlieb (2017) study nearly all of the student enjoyed their experiences and believed that the near peer teaching program improved their teaching skills.

Seema and Syeda (2014) reported greater satisfaction for peer learners regarding their mode of interactive and cooperative learning, ease of communication and active participation. A number of studies have confirmed the role of collaboration among peers in enhancing teamwork and communication skills (Hammond et al., 2010; Ibraheem & Aijaz, 2011; Velez et al., 2011). In our study students preferred the peer method in the domain of examination and evaluation. In the study of Rashid et al. (2011), 98% of students believed that the pre-examination formal revision program conducted by their peers, had improved their learning and identified peer method as being suitable for pre-exam preparation.

As expected, in the majority of terms relating to the observance of the principles and rules of learning, lecturing was preferred to the peer, especially in the area of classroom management, expression of introduction, summation of the course content and teacher proficiency and skill. This can be attributed to the greater teaching experience of the faculty members, a necessary requirement for teaching of the theoretical courses. In a peer teaching study for medical student, House et al. (2017) reported that peer educators provided inadequate information about contents which was taught by physician member of faculty. Furthermore, physician responded to the questions better, monitored the material learned by the students, corrected the mistakes, and provided additional explanations.

5. Conclusion

The peer teaching is a valuable method in teaching-learning process which induces active participation for a deeper understanding of subject matters, self-learning and livelier and more enjoyable classroom. However, lecturing was still perceived by students as the preferable approach due to adherence to the basic principles of learning, teaching and its management. Using peer education as a complementary method in teaching theoretical courses along with the traditional lecture method seems to be appropriate. Given the important role played by midwives in training and prevention of health problems in women and limited number of peer education studies in this area, more extensive studies are required.

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