

Research Article**Effects of Different Teaching Methods on Nursing Students' Motivations and Critical Thinking Disposition: A quasi-experimental Study***Yeter DURGUN OZAN ¹  Mesude DUMAN ²  Gözde GÖKÇE İSBİR ³ **Abstract**

It is important to replace the traditional teacher-centered teaching approach with other different teaching methods. The present study aimed to determine the influence of different teaching methods used in the course of infertility nursing on students' motivation and on their critical thinking disposition. The study was conducted as a quasi-experimental study using the one-group pretest-posttest design. The optional course of infertility nursing was taken by a total of 113 students. The results demonstrated that the different teaching methods applied in the study led to a statistically significant difference in the students' their critical thinking dispositions and in their levels of motivation. It was also found that watching movies, technical visits and doing research were more influential on increasing the students' motivations than other teaching methods. The results revealed the importance of using different active teaching methods for the development of students' motivations and critical thinking skills in nursing education.

Keywords: Active learning, teaching methods, nursing education, infertility nursing**1. INTRODUCTION**

Infertility is among the most important health-related problems influential on couples both in our country and in other countries in the world (American College of Obstetricians and Gynecologists [ACOG] 2017; Kirca & Pasinoğlu, 2013; World Health Organization [WHO] 2017). Nurses working in the field of infertility are expected to learn their roles and responsibilities during their undergraduate education, to plan the caring given to infertile couples, to be knowledgeable about maintaining the care and to raise their awareness of the related skills. Within the scope of infertility nursing course, trainers of nurses should use teaching methods different from traditional ones to increase students' active participation, to improve the quality of learning and to achieve the goals of the education process (Biggs et al., 2011). In literature, various methods have been suggested to increase students' participation in lessons. Examples of these methods include portfolio development, clinical journals, clinical reaction paper (reflection paper on clinical experience), group presentation, case studies and cooperative learning (Saeedi et al., 2021). The effective teaching methods described in literature that led to an improvement in academic motivation were simulation, case-based learning, cooperative learning, learning contract, peer assessment, and self-assessment using video typing (Saeedi et al., 2021). New methods apart from the traditional teacher-centered approach not only allow students to take active part in the learning process but also increase their motivation. In a qualitative study using different teaching methods to examine the experiences of students from the department of nursing and

Received Date: 18/01/2022

Accepted Date: 11/05/2022

Publication Language: English

To cite this article: Durgun-Ozan, Y., Duman, M., & Gökçe-Işbir, G. (2022). Effects of different teaching methods on nursing students' motivations and critical thinking disposition: a quasi-experimental study. *International e-Journal of Educational Studies*, 6 (12), 95-104. <https://doi.org/10.31458/iej.1059478>

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midwifery regarding the course of infertility, it was found that these methods helped the students understand the subjects better, increased the permanency of their knowledge, contributed to their social and cultural developments, allowed them to evaluate themselves, developed their communication, interaction and leadership skills and most importantly increased the students' satisfaction with and motivation in the course (Gokce-Isbir & Durgun-Ozan, 2018).

Motivation is an important factor in the learning process of individuals (Kutu & Sozbilir, 2011). Since motivation makes individuals more energetic and increases their desire to learn, it regarded as one of the most important factors in the teaching and learning process (Kutu & Sozbilir, 2011). In literature, there are a number of studies demonstrating that motivation is influential on students' academic achievements and performances (Kosgeroglu et al., 2009; Rose, 2011). Motivation decreases students' stress, increases their creativity and facilitates their learning in the learning process (Hassankhani, Aghdam, Rahmani, & Mohammadpoorfard, 2015). Students who get motivated to learn view learning as an opportunity to satisfy their own curiosity and willingness to reach the information (Rose, 2011). Academic motivation in nursing education is as important as or even more important than that in other fields of studies. The provision of quality nursing services entails training nursing students with enough motivation to receive a great volume of information and skills, as well as a will to continuously learn and re-learn as the field develops. It is possible to improve motivation in nursing students through proper interventions. One of the main roles played by instructors is to motivate students through the design and presentation of education contents. (Saeedi et al., 2021). Infertility nurses should have the critical thinking skills necessary to meet the needs of infertile couples who have complicated health problems and to make rational decisions for their caring. Critical thinking is a basic skill which should be acquired in the education process for use in professional nursing practices (Amorim & Silva, 2014). It is a well-known fact that the critical thinking skill increases academic achievement (Ip et al., 2000; Tümkaya, 2011) and that students with higher scores of critical thinking are more successful in professional practices (Bowles, 2000). Active learning methods contribute to the development of students' critical thinking skills (Chi & Wylie, 2014; Gokce-Isbir & Durgun-Ozan, 2018; Lee et al., 2016).

Studies on active teaching methods used in our study could not be found in the literature. In literature, it is pointed out that traditional methods are not sufficient in encouraging motivation and critical thinking (Carter, 2016). Although the importance of methods provoking motivation and critical thinking is apparent in the undergraduate curricula of nursing, there is not enough research on the effectiveness of teaching methods used for the development of these skills (Carter, 2016). Implementation of applied and participatory methods in teaching process improved the academic motivation of nursing students. Therefore, using such methods, nursing instructors can improve the academic motivation of their students (Saeedi et al., 2021). We think that this study will contribute to the literature with the different applied and participatory methods used. The purpose of the present study was to examine the influence of different teaching methods used in the course of infertility nursing on students' motivation and on their critical thinking dispositions. In research articles, method should be placed here and the above mentioned principles should be considered.

1.1. Research Question

Are different teaching methods effective on nursing students' motivation and critical thinking dispositions?

2. METHOD

2.1. Research Design

The study was carried out using the one-group pretest-posttest design quasi-experimental research design with a single group. A quasi-experimental design aims to establish a cause-and-effect relationship between an independent and dependent variable. Quasi-experimental design is a useful tool in situations where true experiments cannot be used for ethical or practical reasons. Therefore, quasi-experimental research design was used in our study (Gopalan, Rosinger & Ahn, 2020; Siedlecki, 2020).

2.2. Study Group

The study was conducted with third grade students attending the department of Nursing at a university in the East of Turkey between February and June in 2018. Infertility Nursing is optional course. Students have to select optional courses each academic term, and one academic term lasts 15 weeks. At the time of the study, the course of Infertility Nursing was taken by 113 students, all of whom were invited to take part in the study. However, 10 of them refused to participate in the study, and 16 students were excluded as they missed some of the classes. As a result, the study was conducted with a total of 87 students, and 76,9% of the whole research universe was reached in the study.

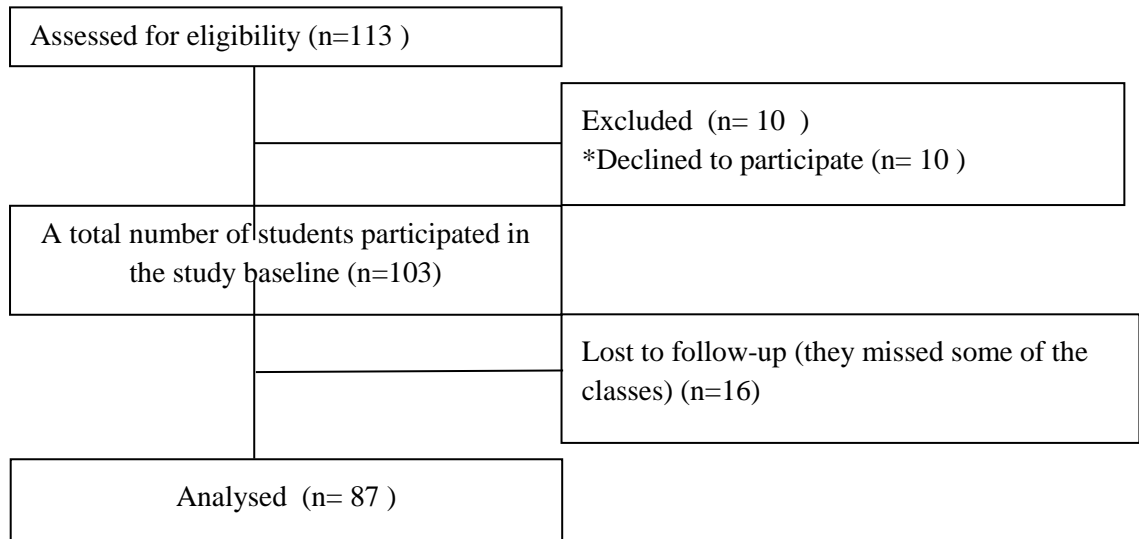


Figure 1. Study diagram

Course content and the teaching process: In line with its objectives, the course focuses on comprehensive physical and psychological evaluation of couples with the infertility problem, treatment methods, up-to-date developments and the problems likely to be encountered by the health team members. For this purpose, different teaching methods were used to increase the students' motivation and active participation in the course. Table 1 presents the course content and the related teaching process.

2.3. Data Collection

In the study, as the data collection tool, a socio-demographic information form, Critical Thinking Disposition Scale and Adaptation of Instructional Materials Motivation Survey were used. Students are divided into eight groups. Seven groups consist of 11 students and one group consists of 10 students. The subjects were given to the students as indicated in Table 1 and it was determined which group would teach in which week. And there was a group discussion each week. At the beginning and end of the study, the critical thinking disposition scale was applied, and after each group work, the adaptation of instructional materials motivation survey was conducted.

Table 1. Content of the course of infertility nursing and different teaching methods applied

Week	Content	Method of teaching	Learning activity
Week 1	Introduction Course objectives Introduction to the sources Introduction to the course and teaching activities	Lecturing by the faculty member	The faculty member and the students introduced each other. The students were informed about the course objectives, about the learning activities and about how to reach and use the course materials The groups were determined for each learning activity.
Week 2	Factors influential on fertility	Phenomena-based group discussion	The group was divided into two. The two groups of participants prepared a discussion and presentation regarding the factors in influential on fertility using the sources available. One group focused on the fertility of men, and the other focused on that of women.
Week 3	Methods of diagnosis of infertility, role of nurses, nursing approaches to assisted reproductive techniques	Group discussion	The students got prepared for the subject in advance. Under the guidance of the faculty member, they discussed the subject as a whole group.
Week 4	Infertility and media	Poster presentation using newspaper extracts	Every day for six weeks, he students followed the newspapers they determined in the first week and gathered the news about infertility. In the first class hour, the students in their own groups prepared a poster using the news they had gathered. In the second class hour, they presented their posters to the other groups.
Week 5	Traditional practices in infertility	Research	The students were asked to do research on traditional practices.
Week 6			The mid-term exams last two weeks at the school where the study was conducted. In this period of time, a break to the lessons is given due to the insufficient number of classrooms at the school.
Week 7	MID-TERM EXAM		
Week 8	Infertility and discussion on the triangle of woman, culture and religion	Group discussion	The students got prepared for the subject in advance. Under the guidance of the faculty member, they discussed the subject as a whole group.
Week 9	Discussion on the psychosocial and psychosexual effects of infertility	Reading a book, doing analysis-synthesis related to the subject	At the beginning of the academic term, every student selected and read a different book determined in relation to infertility. They were asked to make a presentation evaluating the events and characters in the book with respect to the psychosocial and psychosexual effects of infertility.
Week 10	Visit to infertility clinic	Technical visit	A visit was organized to the infertility unit of a health institution determined at the beginning of the academic term. The students were expected to communicate with the patients, to direct questions to their colleagues working there about the functioning of the clinic and to observe certain practices there. Following this, they shared their experiences in class.
Week 11	-Surrogate motherhood -Effects of the infertility process on couples	Debate	The students discussed the subjects obeying the rules of debating_in groups determined at the beginning of the academic term
Week 12	Infertility and the ethical problems experienced in the treatment process	Debate	The students discussed the subjects obeying the rules of debating in groups determined at the beginning of the academic term
Week 13	Infertility, family process and surrogate motherhood	Watching a movie	The students watched a movie titled "Juno", which was directed by Jason Reitman and which received a total of 39 awards including Oscar.
Week 14	Legal regulations regarding the assisted reproductive techniques	Group discussion	The students got prepared for the subject in advance. Under the guidance of the faculty member, they discussed the subject as a whole group.
Week 15	Evaluation of the course	Group evaluation	Data collection using the focus-group method

*Gökçe-İsbir and Durgun-Ozan, 2018

2.3.1. Socio-demographic Information Form: This form was developed by the researchers. The form was made up of eight questions related to the participants' socio-demographic backgrounds. The students were directed questions regarding their ages, gender, marital status, financial state, birth of place and their place of accommodation.

2.3.2. Critical Thinking Disposition Scale: The scale was developed by Semerci in 2016 (Semerci, 2016), and it was made up of five sub-dimensions: metacognition, flexibility, systematicity, tenacity-patience and open-mindedness. The scale included a total of 49 items: 14 items in the sub-dimension of metacognition (Item numbers 1 to 14), 11 items in flexibility (item numbers 15 to 25), 13 items in systematicity (item numbers 26 to 38), eight items in tenacity-patience (item numbers 38 to 46) and three items in open-mindedness (item numbers 47 to 49). The internal consistency coefficients for the five sub-dimension of the scale were found to be .89, .89, .90, .83 and .67, respectively. The Cronbach's alpha was calculated as .96 for the whole scale.

2.3.3. *Adaptation of Instructional Materials Motivation Survey*: The Adaptation of Instructional Materials Motivation Survey was developed by Keller in 1987, and Kutu and Sözbilir adapted the scale into Turkish in 2011 conducting the related validity and reliability studies (Kutu & Sozbilir, 2011). The scale was made up of two sub-dimensions: “attention-relevance” and “confidence-satisfaction”. In the phase of attention, students’ attention is drawn into the lesson and maintained till the end of the lesson.

In the phase of relevance, students are made aware of the relevance of the subject to their personal needs and purposes. In the phase of confidence, students are made aware that they can be successful with the help of their personal efforts. Lastly, in the phase of satisfaction, students’ achievements are awarded with various reinforcers to help them feel internal satisfaction. In the dimension of attention-relevance, there were 11 items (item numbers 1 to 11), and in the dimension of confidence-satisfaction, there were 13 items (item numbers 12 to 24). The items numbered 3, 12, 14, 16 and 18 in the scale included negative statements. For the whole scale, Cronbach’s alpha was calculated as .83.

2.4. Statistical Analysis

The research data were analyzed using the statistical package software of IBM SPSS Statistics 25.0 (IBM Corp., Armonk, New York, USA). The descriptive statistics included numbers (*n*), percentage (%), mean \pm standard deviation. In order to see whether the sub-scale scores demonstrated a normal distribution or not, Shapiro Wilk normality test and *Q-Q* graphs were used. As different methods were applied to the same students, the scale scores were compared in terms of different methods with the help of one-way analysis of variance in repeated measures. As for the multiple-comparisons, As for the multiple-comparisons, Bonferoni correction test was applied to reveal which groups caused the difference. The statistical significance value was taken as $p < 0.05$.

2.5. Ethical Considerations

For the study, the consent of the ethics council of a university hospital in the East of Turkey was taken (Number: 2018/97). Also, the consents of the students and of the Directory of Health School, where the present study was conducted, were taken.

3. FINDINGS

Of all the students, their average age was 21.5; 56.6% of them were female; 62.1% of them were living in the city centre; and 55.2% of them had an income equal to their expenses. Among all the students, 89.7% of them had a nuclear family; 94.3% of them had an unemployed mother; and 67.8% of them had an employed father.

Table 2. Influence of use of different teaching methods on the attention-relevance sub-dimension of the motivation scale (n=87)

Methods	Descriptive Statistics		
	Mean \pm Standard Deviation	Methods found different **	
Phenomena-based group discussion (1)	3,13 \pm 0,84	2, 3, 5, 6, 7, 8	
Poster presentation (2)	3,99 \pm 0,66	1, 4, 8	
Research (3)	4,17 \pm 0,75	1, 4, 5	
Group discussion (4)	3,36 \pm 0,78	2, 3, 6, 8	
Reading a book (5)	3,58 \pm 0,99	1, 3, 6, 8	
Technical visit (6)	4,24 \pm 0,68	1, 4, 5, 7	
Debate (7)	3,75 \pm 1,04	1, 6, 8	
Watching a movie (8)	4,32 \pm 0,74	1, 2, 4, 5, 7	
Model Statistics*			
Influence of Methods	<i>F</i>	<i>p</i>	Effect Size
	25,481	<0,001	0,690
			Statistical Power
			1,000

* : One-way analysis of variance in repeated measures

** : Comparisons between the methods were done using the Bonferoni correction test for multiple comparisons.

According to Table 2, the attention-relevance sub-scale scores differed depending on the methods ($F=25,481$; $p<0,001$). In relation to the difference between the methods, the effect size was calculated as 0,690, and the statistical power was found to be 100%. The scores related to the phenomena-based group discussions were found to be statistically lower than the scores related to poster presentation, research, reading a book, technical visit, debate and watching a movie. Also, it was revealed that the poster presentation scale scores were higher than the group discussion scores and lower than the scores related to watching a movie. The research method scale scores were found to be higher than the scores related to group discussion and reading a book. In addition, the scores related to group discussion and reading a book were statistically lower than the scores related to technical visit and watching a movie. The technical visit scores were statistically higher than the debate scores. Also, the debate scores were found to be statistically lower than the scores related to watching a movie. All these results demonstrated that the highest mean score belonged to the method of watching a movie. Lastly, no statistically significant difference was found between the scores related to the method of watching a movie and the scores related to research and technical visit.

Table 3. Influence of use of different teaching methods on the confidence-satisfaction sub-dimension of the motivation scale (N=87)

Methods	Descriptive Statistics			
	Mean \pm Standard Deviation	Methods found different **		
Phenomena-based group discussion (1)	3,36 \pm 0,70	2, 3, 6, 7, 8		
Poster presentation (2)	3,96 \pm 0,79	1, 4		
Research (3)	3,86 \pm 0,67	1, 4		
Group discussion (4)	3,46 \pm 0,76	2, 3, 6, 8		
Reading a book (5)	3,66 \pm 0,84	6, 8		
Technical visit (6)	4,15 \pm 0,67	1, 4, 5		
Debate (7)	3,84 \pm 0,86	1		
Watching a movie (8)	4,16 \pm 0,77	1, 4, 5		
Model Statistics*				
	<i>F</i>	<i>p</i>	<i>Effect Size</i>	<i>Statistical Power</i>
Influence of Methods	15,650	<0,001	0,578	1,000

* : One-way analysis of variance in repeated measures

** : Comparisons between the methods were done using the Bonferroni correction test for multiple comparisons.

According to Table 3, the confidence-satisfaction sub-scale scores did not differ depending on the weeks ($F=15,650$; $p<0,001$). In relation to the difference between the methods, the effect size was calculated as 0,578, and the statistical power was found to be 100%.

The scores related to the phenomena-based group discussions were found to be statistically significantly lower than the scores related to poster presentation, research, technical visit, debate and watching a movie. The confidence-satisfaction sub-scale scores related to poster presentation and research were significantly higher than the group discussion sub-scale scores. The sub-scale scores related to group discussion and reading a book were significantly lower than the scores related to technical visit and watching a movie. According to these results, the highest mean score belonged to the method of watching a movie. It was found that the scores related to the method of watching a movie did not statistically differ from the scores related to the methods of poster presentation, research, technical visit and debate.

Table 4. Comparison of the students' critical thinking dispositions (n=87)

Critical thinking disposition	Pre-test M (SD)	Post-test M (SD)	t	*p
Metacognition	3.84 (.57)	4.07 (.52)	-3.78	.000
Flexibility	3.83 (.54)	4.05 (.54)	-4.24	.000
Systematicity	3.69 (.58)	3.92 (.57)	-3.97	.000
Tenacity and patience	3.76 (.62)	3.92 (.58)	-2.80	.006
Open-mindedness	3.66 (.72)	4.03 (.66)	-4.36	.000

Note. t test independent groups * $p < .05$

Table 4 presents the pretest and posttest results regarding the influence of different teaching methods used in the course of infertility nursing on the students' critical thinking dispositions. It was found that use of different teaching methods lead to a statistically significant difference in the students' critical thinking dispositions (metacognition, flexibility, systematicity, tenacity-patience and open-mindedness) ($p < .05$).

4. DISCUSSION and CONCLUSION

In the presents study, different active teaching methods were applied in the course of infertility nursing rather than the traditional teacher-centered approach. The findings revealed that the teaching methods applied within the scope of the study were influential on the students' motivation and on their critical thinking dispositions. Learners' preferences of educational materials change in line with the development of technology. Use of teaching methods in line with these changes will allow using the sources appropriately (Diekelmann & Ironside, 2002 ; Groccia & Buskist, 2011). National League for Nursing reported that it is necessary to make research-based decisions for the purpose of determining the teaching/learning strategies of nurses' trainers (NLN, 2005). Although the increasing knowledge of how to increase the effectiveness of the course, it is a well-known fact that the traditional methods are still popular (Whitehurst, 2012).

Infertility nurses work as a member of an interdisciplinary team. While nurses have a role in the process of diagnosis and treatment of the couples they give care to, they are also supposed to take care of couples' psychological and sociological states and to pay attention to ethical and legal issues. In one study carried out by Stamatis (2010) to determine the educational needs of students and midwives regarding the assisted reproductive techniques, the researcher pointed out that the midwives had lack of knowledge in the field and that they did not know their professional roles and responsibilities. It is necessary to enhance the curricula for nurse/midwife training programs and to meet the needs of midwives/nurses who take an active role in the developing sector of reproduction health. In studies carried out in our country, it is reported that nursing students do not have sufficient knowledge and awareness although they take a course in the field of infertility (Kılıç et al., 2009). In courses regarding infertility covered in related curricula, the primary focus should be on drawing students' attention to the lesson subject and on raising their awareness to increase their motivation. It is though that motivation in a course is increased using active learning methods (Rose 2011). Motivation is an internal process that directs students' behaviours and energies. These internal processes include a person's goals, beliefs, perceptions and expectations (Dembo, 2000). Motivation also contributes to learning (Köşgeroğlu, 2009). Motivated students view learning as an opportunity to satisfy their curiosity and their desire to obtain information (Rose, 2011). Gökçe-İsbir and Durgun-Ozan (2018), in their qualitative study, used different teaching methods in the course of infertility and assisted reproductive techniques and examined students' experiences. At the end of their study, the researchers found that use of active learning methods were influential on increasing students' motivation and satisfaction. Similarly, in the present study, different active learning methods increased

the students' motivation in the course. It was revealed that among the methods, "watching a movie" was the most influential on motivation. In another study, [Kontaş \(2016\)](#) found that movies used for educational purposes increased internal and external. In this respect, movies related to a lesson subject could be used to draw students' attention and to increase their motivation. However, today, there are no movies related to many of the subjects included in the curricula. For the purpose of enriching this method, short movies whose scenarios are created by the lecturer of the course could be prepared together with real patients and students in cooperation with external stakeholders. Students' involvement in the process could contribute to their motivation as well. It is quite important to develop the critical thinking skills of nurses working in cooperation with different disciplines ([Castledine, 2010](#); [Muoni, 2012](#)). Students should develop these skills with the help of courses they take during their undergraduate education as well as with the methods applied while teaching these courses. It is reported that students with a high level of motivation in a course and with the necessary critical thinking skills are more successful in academic terms ([Bowles, 2000](#); [Ip et al., 2000](#); [Rose, 2011](#); [Tümkaya, 2011](#)). In a study comparing lecture and Jigsaw teaching (cooperative learning) methods, it was found that The Jigsaw teaching method increased the self-regulated learning and academic motivation of nursing students ([Sanaie et al., 2019](#)). As a result of this study, students cooperated with each other by using different education methods and their motivation increased.

Critical thinking refers to defining and analysing problems attentively in the sense of questioning ([Castledine, 2010](#)). In studies, it is pointed out that active learning methods used in courses develop students' critical thinking skills ([Carter, 2016](#); [da Costa Carbogim et al., 2018](#); [Lee et al., 2016](#)). On the other hand, in a systematic review made by [Carter et al., \(2016\)](#) to examine the effectiveness of methods used to develop nursing/midwifery students' critical thinking skills, it is reported that the most popular active learning method was the problem-based teaching method and that there is little evidence regarding the effectiveness of the methods, though. In the present study, it was found that use of different active teaching methods increased the students' critical thinking skills. Students have different learning styles. Therefore, some students may get motivated with the help of teaching methods, while some may not. For this reason, it is inevitable to use different learning methods appropriate to the subject included in the curriculum. However, lack of evidence regarding the methods makes it difficult for the lecturer to determine the teaching method he or she will apply and causes the lecturer to make experience-based decisions. In the present study, a number of different methods were used, and it was revealed that the methods holistically increased the students' motivation and their critical thinking skills. For the purpose of achieving the goals determined based on efficacy in the curriculum of nursing/midwifery, holistic models involving the use of different teaching methods could be formed, and evidence-based knowledge should be increased. This study revealed the teaching methods effective in academic motivation of nursing students. The majority of such methods focused on applicability of the contents and participation of the students. As the results recommended, the instructors can use this student-centered approaches based on the capabilities of the learners to motivate and activate the students in the learning process and improve self-guided learning.

Limitations of this study: In the study, there were several limitations. First of all, more than one different active teaching method were applied, and after each application, the students were asked to evaluate the method. The students had to fill in a scale in almost every lesson. In order to avoid this problem, fewer methods could be applied together. Secondly, at our school, students have the right to miss 20% of the classes in theoretical courses. Not all the students attended all the classes. This situation resulted in losses in terms of sampling. Another limitation of our study is that it was measured in a single group and there was no control group.

Impact statement: In the study, for the students with different learning styles who took education together, use of multiple active learning methods increased the effectiveness of their learning. The results obtained in the present study revealed that use of different active teaching

methods increased the students' motivation and critical thinking skills during their nursing education. Therefore, there is a need for high-quality studies to form holistic models involving use of multiple teaching strategies within the scope of the nursing/midwifery curriculum, to evaluate the effectiveness of these models and to provide evidence-based information for the evaluation of new teaching methods. In addition, preparing guides for evidence-based teaching methods could be beneficial for trainers. There is a need for further research on the effectiveness of different teaching methods on other branches of nursing.

Acknowledgment

The data used in this study was confirmed by the researchers that it belongs to the years before 2020. The authors would like to thank the nursing students who participated in this study for their time and patience.

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