

## Hemşirelik Öğrencilerinde PechaKucha ve İnfografik Sunumları: Yarı Deneysel Bir Çalışma

### A PechaKucha and Infographics Presentations among the Nursing Students: A Quasi-Experimental Study

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#### Öz

**Amaç:** Bu çalışmada, Gestasyonel Diyabetis Mellitus ve Gestasyonel Hipertansiyon konularında hazırlanan PechaKucha (PK) ve infografik sunumlarının hemşirelik öğrencilerinin öğrenme performansını ve memnuniyetlerini karşılaştırmak amaçlanmıştır.

**Gereç ve Yöntem:** Bu yarı deneysel çalışma 2022-2023 eğitim-öğretim yılında Ankara'daki bir hemşirelik bölümünde gerçekleştirilmiştir. Araştırma çalışmaya katılmayı kabul eden 30 öğrenci ile yürütülmüştür. Öğrenciler, birinde PK formatını ve diğerinde ise infografik sunum formatını kullanarak iki sunum hazırlamışlardır. Öğrencilerin öğrenme performansını değerlendirmek için GHT Bilgi Testi ve GDM Bilgi Testi, memnuniyet düzeylerini değerlendirmek için PK ve İnfografik Sunum Metodları Ölçeği ve PK ve İnfografik Methodları Deneyimleri Değerlendirme Formu kullanılmıştır.

**Bulgular:** Araştırmanın sonuçları, PK ve infografik tekniklerinin kullanıldığı gruplar arasında hem bilgi düzeyleri ( $p > 0.05$ ) hem de memnuniyet düzeyleri ( $p = 0.161$ ) açısından anlamlı bir fark olmadığını gösterdi. Ancak öğrencilerin bu yöntemleri kullanmaktan oldukça memnun kaldıkları ve bu teknikleri derslerine aktif olarak dâhil etme isteklerini dile getirdikleri gözlenmiştir.

**Sonuç:** Farklı öğretim tekniklerinin kullanılması yalnızca öğrencilerin bilgi düzeylerinin geliştirilmesi için değil aynı zamanda memnuniyet düzeyleri açısından da önemlidir. Hemşirelik eğitiminde geleneksel öğrenme yöntemlerinin yanı sıra öğrenme hedeflerine uygun PK ve infografik yöntemlerin de kullanılması önerilmektedir.

**Anahtar Kelimeler:** Eğitim, hemşirelik, infografikler, PechaKucha, yüksek riskli gebelikler

#### Abstract

**Aim:** This study aims to compare the effects of creating PechaKucha (PK) versus infographics presentations of a Gestational Diabetes Mellitus (GDM) and Gestational Hypertension (GHT) on nursing students' learning performance and satisfaction.

**Material and Methods:** This quasi-experimental study was conducted during the 2022-2023 academic year in a nursing school with 30 students in Ankara, Turkey. Students created two presentations, one using the PK format and the other using infographic presentation format. In the study, GDM Knowledge Test and GHT Knowledge Test were used to evaluate the students' learning performance, and The PK and Infographics Presentation Methods Scale and The Evaluation Form for Experience with PK and Infographics Methods were used to evaluate their satisfaction levels.

**Results:** The results of the study indicated that there were no significant differences in both the knowledge levels ( $p > 0.05$ ) and the satisfaction levels ( $p = 0.161$ ) between the groups where PK and infographic techniques were used. However, it was observed that students were highly satisfied with using these methods, and they expressed their desire to actively incorporate these techniques into their coursework.

**Conclusion:** In nursing education, integrating tailored PK and infographic methods alongside traditional approaches is crucial for enhancing both students' knowledge and satisfaction levels.

**Keywords:** Education, nursing, infographics, PechaKucha, high risk pregnancies

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## Introduction

High-risk pregnancies are a significant health concern that threatens the well-being of both the mother and the fetus, with approximately 22% of pregnancies being considered high-risk.<sup>1</sup> Unfortunately, the inability to manage high-risk pregnancies continues to lead to maternal and fetal losses in both developed and developing countries.<sup>2</sup> Among the problems that contribute to high-risk pregnancies are chronic health conditions such as diabetes or high blood pressure, infections, complications stemming from previous pregnancies, or other issues that may arise during pregnancy (such as placental abruption, placenta previa, etc.). It can be noted that the increasing prevalence of gestational diabetes mellitus (GDM) is particularly influenced by rising obesity and a sedentary lifestyle.<sup>3</sup> Globally, the prevalence of GDM varies between 1% and 28%, while studies in Turkey report this rate as 1% to 9%.<sup>4,5</sup> Additionally, gestational hypertension (GHT), another leading cause of high-risk pregnancies, is a prominent factor in maternal deaths worldwide.<sup>6</sup> Preeclampsia is observed in 2-4% of all pregnancies worldwide and leads to approximately 46.000 maternal deaths and 500.000 fetal/newborn deaths annually.<sup>7</sup> In Turkey, it ranks second among maternal causes of death with a rate of 13.7%.<sup>8</sup> The provision of adequate and appropriate nursing care is crucial for preventing or managing the maternal-fetal risks associated with high-risk pregnancies. Nurses play a significant role in screening and managing GDM and GHT offering counseling to women on lifestyle changes (exercise, diet, and nutrition), ensuring the proper administration and adherence to medications if necessary.<sup>9</sup> Therefore, it is essential to effectively teach these two topics to students in Obstetric and Women's Health Nursing courses.<sup>10</sup>

Due to the limited attention spans of Generation Z and their tendency to get easily bored when they perceive monotony and repetition, there has been a need to make changes in traditional teaching methods.<sup>11</sup> Furthermore, a study has shown that Generation Z prefers visual methods that enable active learning.<sup>12</sup> However, the COVID-19 pandemic and the shift to remote education have made it necessary to actively engage students in the learning process.<sup>13</sup> As a result, in recent years, creative methods have been employed in nursing education to strengthen the teaching process and enhance learning outcomes.<sup>14</sup> Creative methods used in nursing education include PK and infographics.<sup>15,16</sup>

PK, an instructional method originating in Japan, involves delivering a presentation with 20 slides, each displayed for 20 seconds, resulting in a concise presentation of 6 minutes and 40 seconds.<sup>17</sup> An essential consideration in presentation preparation is the use of pertinent, high-quality visuals to maintain audience focus and prevent distraction.<sup>15</sup> As part of PK presentation preparation, students are urged to rehearse and practice multiple times, fostering information

synthesis and enhancing learning and communication skills.<sup>18</sup> Additionally, students have reported that PK enhances their learning of the subject matter in their courses.<sup>19</sup> Another advantage of the PK method is that it allows students to use their imagination and creativity when selecting visuals that fit the presentation content.<sup>20</sup> However, some studies have compared classes using the PK technique to those using traditional presentation methods and found no significant differences in achievement levels.<sup>15,21</sup> Although the positive impact of the PK technique in education is evident, its application in nursing education has limited research

Given that a majority of individuals exhibit a predisposition for visual learning, it is often observed that students experience enhanced learning when exposed to visual instructional materials.<sup>22</sup> Visual information is recognized faster than words, and visualizations can help students grasp complex sets of information more easily.<sup>23</sup> Infographics, on the other hand, are visual tools that combine images and text to concisely frame information and ideas.<sup>24</sup> Infographics may include some data visualization resources like charts, maps, or graphs as part of their designs, but they typically incorporate text and relevant graphics to convey information in a narrative format.<sup>25</sup> The use of infographics as a teaching and learning technique for Generation Z is well-suited to their needs and interests because they are accustomed to using visual media and combining multimedia learning techniques.<sup>26</sup>

The aim of this study is to compare two different teaching methods, PK and infographics, in the context of high-risk pregnancies within the Obstetric and Women's Health Nursing course for nursing students. Specifically, the study focuses on two crucial topics, gestational diabetes and gestational hypertension, under the high-risk pregnancies category. Additionally, the research aims to assess students' satisfaction with these two teaching methods.

### **Research Questions**

1. Is there a difference in the knowledge scores between students using the PK method and those using the Infographic method?
2. Is there a difference in the satisfaction levels between students using the PK method and those using the Infographic method?

### **Material and Methods**

#### **Aim**

This study aims to compare the effects of creating PK versus infographics presentations of a GDM and GHT on nursing students' learning performance and satisfaction.

## Study Design

This present study; featuring a quasi-experimental design; was structured and reported according to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist; which is employed for reporting case-control studies.

## Intervention

The Obstetric and Women's Health Nursing course is a 14-week course with four hours of theory and 12 hours of practice and includes 15 ECTS (European Credit Transfer and Accumulation System) credits. High-risk pregnancies are covered in this course. During the first week of the obstetrics and gynecology course; the students were informed about the PK and infographics methods; and the guides were uploaded to the Moodle system. In addition, the students were advised about the PK website (PK.org) and how to create infographics.<sup>27</sup> During this process, the students were informed about the method they should use to prepare their presentations. The resources needed to prepare the presentations were uploaded to Moodle. During the preparation of the presentations, weekly meetings were held with the students; and the student's presentation preparation and the assessment process were given in Table 1.

**Table 1.** Implementation steps of the research

Steps	Description of steps
1 <sup>st</sup>	Informing students and uploading the presentation evaluation questionnaire to Moodle
2 <sup>nd</sup>	Uploading the students' presentations on GDM to Moodle and presenting them face-to-face
3 <sup>rd</sup>	Conducting a knowledge test regarding GDM
4 <sup>th</sup>	Uploading students' presentations on GHT to Moodle and presenting them face-to-face
5 <sup>th</sup>	Conducting a knowledge test regarding GHT
6 <sup>th</sup>	Surveying students about their level of satisfaction and preferences regarding teaching methods

## Settings and Participants

This study was conducted at the School of Health Sciences of a university in Ankara; Turkey; in the academic year 2022–2023. The study sample consisted of 30 students who were enrolled in the third-year obstetrics and gynecology course at the Department of Nursing; in the autumn semester of 2022-2023 and who met the inclusion criteria. Students who volunteered to participate in the study; could speak and understand Turkish and were taking the Obstetric and Women's Health Nursing course for the first time were included in the study.

## Instruments

The Participant Information Form is a questionnaire about the students' socio-demographic information. It was prepared by reviewing the relevant literature.<sup>28,29</sup> It consisted of questions about the student's age, gender, class; perceived economic level; the type of high school they had graduated from; grade point average; daily study time; and whether they had prepared presentations on PK and infographics methods before. Two separate test forms were created to

test students' knowledge of GDM and GHT. The questions in each test were prepared by nursing specialist; opinions were obtained from five experts in the field of multiple-choice questions to verify the content and language of the prepared questions. Both tests were administered face-to-face. After the presentation, the students were given a separate 10-question test to determine their level of knowledge about GDM and GHT. The GDM and GHT knowledge test included questions about risk factors; maternal and fetal outcomes, follow-up and care; diagnosis, and complications.

The Infographics and PK Presentation Methods Satisfaction Scale is a measurement tool used to assess students' satisfaction with their method of presentation. The scale is 10 cm long and is scored on a horizontal line (0 = unsatisfied; 10 = very satisfied). Each student was asked to tick a point on this line corresponding to their level of satisfaction. The numerical value indicates the student's level of satisfaction.

The Evaluation Form for Experiences with PK and Infographics Methods consists of 14 questions designed based on a literature review.<sup>30-32</sup>

### **Statistical Method**

The IBM SPSS (Statistical Package for the Social Sciences) 26 program for Windows was used for the statistical analyses. The Kolmogorov-Smirnov test was used for normality tests of numerical variables. Comparisons between the two groups were analyzed using the Student's t-test for variables with normal distribution and the Mann-Whitney U test for variables without normal distribution. Comparisons of more than two groups were analyzed using ANOVA for normally distributed variables and the Kruskal-Wallis test for variables not normally distributed. The descriptive statistics used were arithmetic mean and standard deviation for numeric variables with normal distribution; median, minimum, and maximum for data without normal distribution.  $p < 0.05$  was considered statistically significant.

### **Ethics**

Ethical Committee Approval (E-59394181-604.01.02-49137, Date: 10.11.2022) was obtained from the Atilim University's Human Research Ethics Committee. Written permissions were also secured from the University Rectorate to conduct the research on 3rd-year students of the Faculty of Health Sciences, Department of Nursing. In addition, written informed consents were obtained from the participants to ensure transparency and informed involvement.

## **Results**

### **Demographic Characteristics**

86.7% are female nursing students, mean age of 21.6 (SD=0.85). 63.3% in the metropolitan area for most of their lives. The student's academic grades range from 1.60 to 3.70 (Mean=2.62,

SD=0.46). 70% of students study for 1-4 hours for their lesson. In the survey, students were asked about their previous experience in preparing PK and infographics. It was found that 6.7% students had previously prepared PK, and 13.3% students had prepared infographics (Table 2).

**Table 2.** Demographic characteristics of the participants (n= 30)

Variables	n (%)
Gender	
Female	26 (86.7)
Male	4 (13.3)
Age (years) (mean- SD)	21.6 (0.85)
Marital Status	
Single	30 (100)
Live in	
County	5 (16.7)
City Center	6 (20)
Metropolis	19 (63.3)
Live with	
Family	17 (56.7)
Friends	3 (10)
Alone	6 (20)
Dormitory	4 (13.3)
Grade Point Average (SD)	2.62 (0.46)
Daily Study Time	
Less than 1 hour	5 (16.7)
1-4 hours	21 (70)
More than 4 hours	4 (13.3)
Have you previously prepared PK?	
Yes	2 (6.7)
No	28 (93.3)
Have you previously prepared infographic?	
Yes	4 (13.3)
No	26 (86.7)

### GDM and GHT Knowledge Test Levels

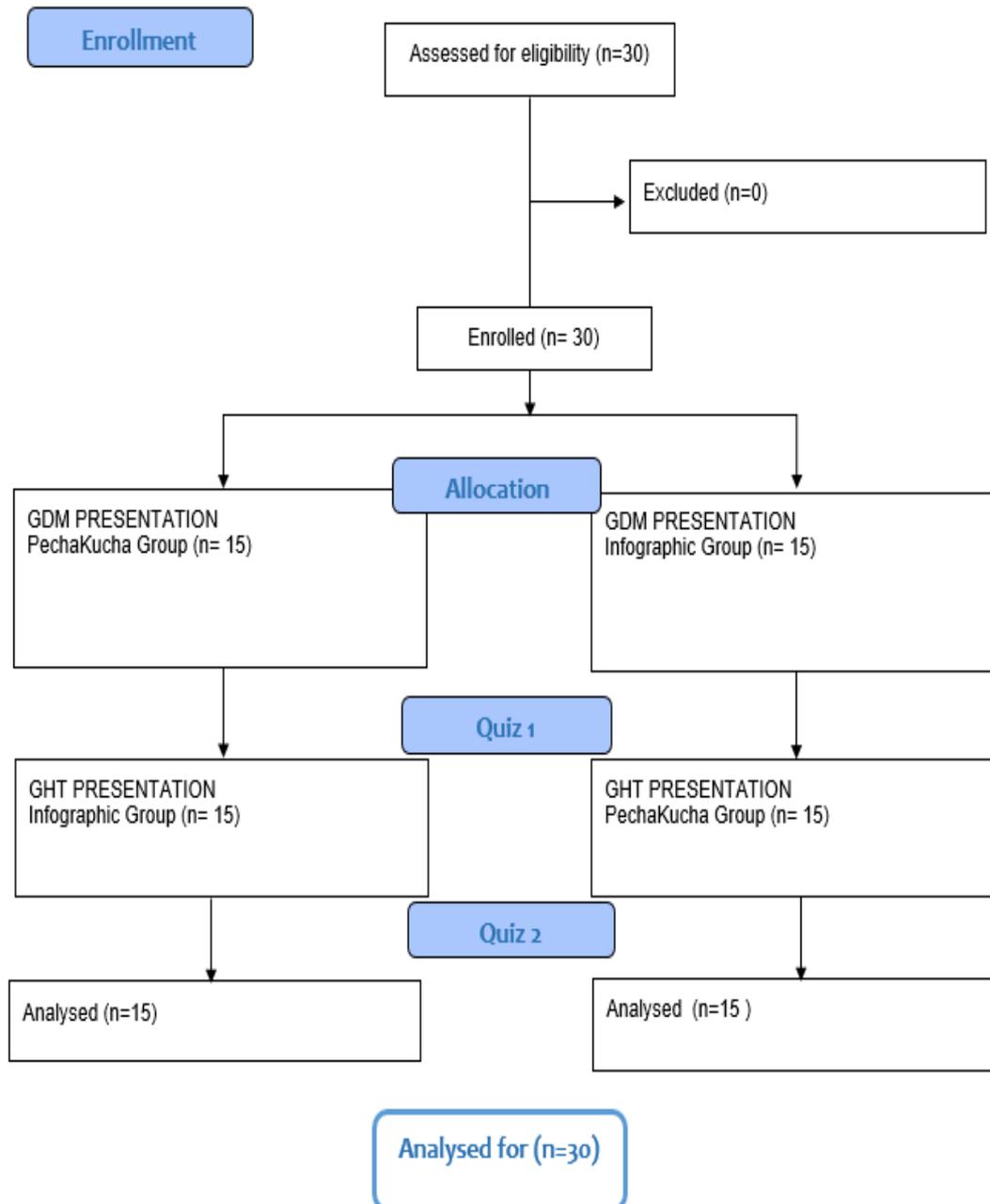
In the study, the knowledge scores of students who used the PK method during the GDM presentation were determined as  $71.60 \pm 5.80$ , while those who utilized the infographics method scored  $72.93 \pm 16.81$ . No significant difference was found between these groups ( $p=0.630$ ). In the GHT presentation, students who employed the PK method obtained knowledge scores of  $79.93 \pm 9.82$ , while students who used the infographics method achieved scores of  $73.86 \pm 21.47$ . Notably, no significant difference was observed in this context as well ( $p=0.518$ ). Furthermore, there was no difference in knowledge scores between students who first used the PK method for the GDM presentation and then for the GHT presentation ( $p=0.637$ ). Similarly, no difference was found among individuals who first employed the infographics method for the GDM presentation and then for the GHT presentation ( $p=0.421$ ). (Table 3).

**Table 3.** Comparison of knowledge test scores PK and Infographic Groups in GHT and GDM

Groups	GDM (n=30)	GHT (n=30)	P Value*
	Mean ± SD	Mean ± SD	
PK (n=15)	71,60± 5,80	79.93± 9,82	0.637
Infographic (n=15)	72.93± 16.81	73.86± 21.47	0.421
P Value**	0.630	0.518	

\*Wilcoxon test

\*\*Man-Whitney U test

**Figure 1.** The flow diagrams of the participants through each stage of the study.

### Satisfaction Levels of Students

The mean satisfaction levels of students PK and infographics methods, the mean satisfaction level for PK was  $6.33 \pm 2.630$ , while the mean satisfaction level for infographics was  $7.26 \pm 2.303$  and no statistically significant difference was found ( $p=0.161$ ). After conducting an analysis of students' preferences, it was observed that both presentation formats consistently produced statistically significant outcomes. However, the PK method was favored more due to reasons related to time management ( $p=0.007$ ), whereas students expressed a desire to incorporate infographics into their future presentations ( $p=0.007$ ). Notably, no significant differences were found between the groups in terms of enjoyment in the classroom setting ( $p=0.122$ ) (Table 4).

**Table 4.** Comparison of Students' Preferences for PK and Infographic Methods

Items	PK n(%)	Infographic n(%)	Both n(%)	Chi- Square	p value
1. It helped me learn how to edit presentation content.	6.7	26.7	<b>66.7</b>	16.800	0.001
2. It helped me learn to present information concisely.	13.3	33.3	<b>53.3</b>	7.200	0.027
3. It helped me learn time management during the presentation.	<b>56.7</b>	10	33.3	9.800	0.007
4. During the presentation, it helped me to use tone of voice, gestures and facial expressions effectively.	13.3	16.7	<b>70.0</b>	18.200	0.001
5. Helped me learn how to select relevant resources and information.	10.0	23.3	<b>66.7</b>	15.800	0.001
6. It gave me the opportunity to practice my creativity.	10.0	40.0	<b>50.0</b>	7.800	0.020
7. My critical thinking ability has improved.	23.3	16.7	<b>60.0</b>	9.800	0.007
8. It gave me the opportunity to improve my presentation skills.	10.0	6.7	<b>83.3</b>	33.800	0.001
9. It provided an opportunity to take responsibility in my learning process.	10.0	10.0	<b>80.0</b>	29.400	0.001
10. I was able to interact with my classmates during the presentation.	6.7	6.7	<b>86.7</b>	38.400	0.001
11. Improved my communication skills.	6.7	3.3	<b>90.0</b>	43.400	0.001
12. It made me enjoy while preparing the presentation.	16.7	36.7	46.7	4.200	.122
13. The presentations made the lesson enjoyable.	10.0	16.7	<b>73.3</b>	21.800	0.001
14. I would like to make future presentations using this method.	10.0	<b>56.7</b>	33.3	9.800	0.007

### Discussion

The objective of this study was to compare the efficacy of two teaching methods for GDM and GTH: PK presentations and infographics for nursing students. The investigation measured the effect of these methods on students' knowledge and satisfaction. The study found no statistically significant difference in knowledge scores between the two instructional techniques, but students exposed to infographics reported higher satisfaction. PK presentations enhanced learning outcomes in nursing education, consistent with prior studies conducted by Byrne (2016)<sup>31</sup> and Joseph and Natarajan (2022a).<sup>33</sup> Furthermore, the research conducted by Joseph

and Natarajan (2022) pertaining to the pathophysiology course demonstrated that knowledge assessment test scores did not significantly differ between students exposed to PK and those utilizing PowerPoint presentation.<sup>31</sup> Similarly, Bakcek et al. (2020) did not identify a significant variance in learning performance between nursing students employing PK and the traditional PowerPoint.<sup>34</sup>

In our study, the PK group exhibited higher satisfaction levels (mean score of 9.12) than the infographics group. This difference may result from the PK group's involvement in creating their own presentations, whereas the infographics group only encountered presentations made by others. This finding is in resonance with a study by Warmuth and Caple (2021), which underscored the pedagogical efficacy and engaging nature of the PK technique.<sup>35</sup> However, it is noteworthy that within our study, students who utilized the PK approach reported lower levels of satisfaction (mean score of 6.3), potentially attributable to the demanding nature of presentation preparation and the students' relative lack of prior experience with PK. Another study observed the effectiveness of the PK method in highlighting key points in presentations on nursing theorists in a graduate nursing theory course. However, students noted that explaining complex concepts with automatic slide transitions required more time, which differs from Byrne's (2016) results. Our study confirmed that PK helped students organize content effectively and, intriguingly, the time constraints imposed by PK improved their time management skills, contrary to Byrne's findings.<sup>33</sup>

Another study had nursing students use the PK method to present survey findings in a community health assessment course. Students found that PK helped them understand the subject better, increased their confidence, and improved their presentation skills. Our findings support previous research, indicating that the PK method is effective in enhancing nursing students' presentation, communication, and critical thinking skills. Infographics are increasingly gaining recognition as a valuable instructional tool in nursing education due to their capacity to simplify complex information through visual.<sup>36,37</sup> Research is ongoing to explore how it can improve learning in different areas of nursing education.<sup>22-27</sup> Following an assignment involving infographics within the framework of an innovative technology-driven approach to a public health education course, nursing students reported that creating infographics was informative and fostered creativity, making the learning process enjoyable.<sup>38</sup> In our study, students who engaged in infographic creation similarly attested to enhanced creativity and a more enjoyable learning experience, aligning with prior research findings<sup>37</sup>. Bradshaw and Porter<sup>21</sup> and Hsiao et al.<sup>39</sup> reported favorable outcomes regarding the use of infographics as an educational tool in nursing. Bradshaw and Porter<sup>21</sup> found that students rated

the infographics method as excellent and good, while Hsiao et al.<sup>39</sup> observed improved abilities in information acquisition, synthesis, presentation, as well as heightened comprehensibility and interest in the presented information. Jaleniauskiene and Kasperuniene<sup>37</sup> noted that infographics enhanced students' learning, information retention, creativity, and communication skills, with students expressing high satisfaction with the approach. In our study, students indicated that both the traditional presentation (PK) method and infographics helped them present information concisely and improved their presentation and communication skills. Nevertheless, a comparison of students' satisfaction with the PK and infographics methods revealed a higher preference for the latter. Furthermore, students expressed a preference for using infographics in future presentations ( $p = 0.007$ ). In conclusion, active and experiential learning environments involving infographic creation seem to have a stronger impact on learning outcomes, as indicated by higher student satisfaction compared to the PK method. Preparing infographics fosters critical thinking and encourages creativity in students.<sup>40</sup>

PK and infographics both effectively enable concise information presentation using visual content.<sup>11,31</sup> Both approaches necessitate students to engage in research, critical thinking, and analysis before developing their visual presentations.<sup>36,37</sup> This alignment with Bloom's revised taxonomy's highest level of learning is noteworthy. Furthermore, both methods cater to the preferences of Generation Z students, who favor visual content and concise information delivery within a short timeframe.<sup>11</sup> Educators should consider students' preferences and integrate active learning strategies into the educational process to foster a more engaging and effective learning environment.

### **Strengths and Limitations**

One of the strengths of this study is that it is the first study to use PK and infographic method in obstetrics and gynecology nursing. Second, the current study found that the satisfaction of the students who created presentations using PK and infographics methods was high. In contrast to the literature, all the students in our study used both PK and infographics methods; which allowed us to investigate individual levels of satisfaction and which method was preferred. In analyzing the students' knowledge levels, we found that there was no significant difference between the groups. The main reason for this was the number of students. Our results cannot be generalized due to the small size of the sample. Furthermore, the sample was only collected from nursing students studying obstetrics and gynecology at a university. Thus, the PK and infographics method needs to be used for similar courses in studies with a larger sample size. We taught the PK and infographics methods for the topics GDM and GHT; which are important

in the obstetrics and gynecology courses. However, it is recommended that studies be conducted using these methods for other topics within obstetrics and gynecology education.

### **Conclusion**

Comparing two different teaching methods; PK and infographics, we found that there was no significant difference between the knowledge levels of the two groups of students about GDM and GHT. The use of different teaching methods is thus more critical concerning student satisfaction than increasing students' knowledge levels about these topics. It is recommended that the use of PK and infographics methods in nursing education be increased in addition to traditional learning methods and in accordance with the necessary learning objectives.

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### **Declaration of competing interest**

The authors declare that no conflicts of interest exist.

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