Ordu Üniversitesi Hemşirelik Çalışmaları Dergisi
Ordu University Journal of Nursing Studies

Ordu University J Nurs Stud
2026, 9(3), 576-585
DOI:1038108/ouhcd.1623029

Sistematik Derleme/Systematic Review

Examination of Graduate Theses Utilizing Virtual Reality Applications in the Field of Surgical Nursing in Türkiye

Türkiye'de Cerrahi Hemşireliği Alanında Sanal Gerçeklik Uygulamaları ile Yapılan Lisansüstü Tezlerin İncelenmesi

Gülseren Maraş Baydoğan [1]

[1] Erciyes University, Faculty of Health Sciences, Surgery Nursing, Kayseri, TÜRKİYE

Geliş tarihi/ Date of receipt: 19/01/2025 **Kabul tarihi/ Date of acceptance:** 11/05/2025
© Ordu University Faculty of Health Sciences, Department of Nursing, Türkiye, **Published online**: 23/06/2026

ABSTRACT

Objective: This study aims to examine graduate theses conducted in the field of surgical nursing in Türkiye that utilize virtual reality applications.

Methods: This retrospective literature review examines theses that utilized virtual reality applications in surgical nursing between 2016 and 2024. The inclusion criteria for the theses examined in the Council of Higher Education Thesis Center database had the keywords "Virtual Reality," "Virtual Reality Goggles," "Virtual Reality Glasses," and "Nursing" in their titles and were being conducted by the Surgical Nursing Department. The study was methodologically structured according to the PRISMA statement checklist.

Result: The screening process identified 15 theses with full texts accessible from 2016 to 2024. It was determined that all of the theses were written in the last eight years, and five theses were at the doctoral level, and 10 theses were at the master's level. When the study designs were examined, all of them were conducted using the experimental method. The theses include the effects of virtual reality applications on biopsy, burns, anesthesia, and different surgical procedures. It has been reported that the applications reduce pain and anxiety levels and have a positive effect on quality of life, physiological parameters, and satisfaction.

Conclusion: The nursing theses on virtual reality concluded that the applications were effective based on their usage purposes. In this context, it is proposed that the use of virtual reality applications in the perioperative period could serve as a non-pharmacological method for mitigating significant issues arising from the surgical process.

Keywords: Surgical, nursing, virtual reality, virtual reality glasses, virtual reality goggles

ÖZ

Amaç: Bu çalışma Türkiye'de cerrahi hemşireliği alanında sanal gerçeklik uygulamaları ile yapılan lisansüstü tezlerin incelenmesi amacıyla planlanmıştır.

Yöntem: Bu retrospektif tipteki literatür araştırmasında 2016-2024 yılları arasında cerrahi hemşireliği alanında sanal gerçeklik uygulamalarının kullanıldığı tezler incelenmiştir. Yükseköğretim Kurulu Ulusal Tez Merkezi veri tabanında incelenen tezlerin araştırmaya alınma ölçütleri; tez başlıklarında "Sanal gerçeklik", "Sanal Gerçeklik Gözlüğü" ve "Hemşirelik" anahtar kelimeleri yer alması, Cerrahi Hemşireliği Anabilim dalı tarafından yapılmış olmasıdır. Çalışma, PRISMA kontrol listesine göre yapılandırılmıştır.

Bulgular: Tarama sonucunda 2016-2024 yılları arasında tam metnine ulaşılan 15 tez değerlendirmeye alınmıştır. Tezlerin tamamının son sekiz yılda yazıldığı ve beş tezin doktora, 10 tezin yüksek lisans düzeyinde olduğu tespit edilmiştir. Çalışma desenleri incelendiğinde tamamı deneysel yöntem kullanılarak yürütülmüştür. Yapılan tezler biyopsi, yanık, anestezi, farklı cerrahi prosedüler konusundaki sanal gerçeklik uygulamalarının etkilerini içermektedir. Uygulamaların ağrı ve anksiyete düzeyini azalttığı, yaşam kalitesi, fizyolojik parametreler, memnuniyet üzerinde olumlu etkisi olduğu bildirilmiştir.

Sonuç: Sanal gerçeklik konusunda yapılan hemşirelik tezlerinde uygulamaların kullanım amaçlarına göre etkili olduğu sonuca ulaşılmıştır. Bu kapsamda, perioperatif süreçte sanal gerçeklik uygulamalarının kullanımının cerrahi sürecin yol açtığı önemli sorunların azaltılmasında farmakolojik olmayan bir yöntem olarak kullanılabileceği önerilmektedir.

Anahtar Kelimeler: Cerrahi, hemşirelik, sanal gerçeklik, sanal gerçeklik gözlüğü

ORCID IDs of the authors: GM: 0000-0002-2876-5772
Sorumlu yazar/Corresponding author: Gülseren Maraş Baydoğan
Erciyes University, Faculty of Health Sciences, Surgery Nursing, Kayseri, TÜRKİYE
*This article was presented as an oral presentation at the 8th International 19th National Nursing Congress.
e-posta/e-mail: gulserenmaras@erciyes.edu.tr
Atıf/Citation: Baydoğan Maraş G. (2026). Examination of graduate theses utilizing virtual reality applications in the field of surgical nursing in Türkiye. Ordu Üniversitesi Hemşirelik Çalışmaları Dergisi. 9(3), 576-585. DOI:1038108/ouhcd.1623029

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2026, 9(3), 576-585
DOI:1038108/ouhcd.1623029

Introduction

Virtual reality (VR) refers to technologies that create a computer-generated digital environment, offering a sense of three-dimensional reality. This environment, produced by computers, transmits artificial sensory information (such as visual, auditory, and kinesthetic stimuli) that helps users experience realistic sensations (Sen et al., 2022). VR technologies are becoming increasingly recognized and accessible across various fields. In healthcare, VR applications are widely used for health preservation, early disease diagnosis, and during education and rehabilitation processes (Sanchini and Marelli, 2020). Healthcare professionals frequently utilize these technologies for preoperative patient education and in managing pain and anxiety resulting from various clinical procedures (Luo et al., 2019).

Virtual reality (VR) applications offer a cost-effective and innovative solution to enhance the preparation of operating room nurses for major surgeries. VR has been reported to improve the technical knowledge, visuospatial skills, motion efficiency, and non-technical skills of inexperienced surgeons in both open and endoscopic procedures, while also reducing operation times and errors (Antonis et al., 2019; Hooper et al., 2019; Logishetty et al., 2019). In a study involving operating room nurses, the use of VR was found to reduce surgery durations by 47% and significantly enhance the knowledge and efficiency of staff. Additionally, participants reported increased confidence and reduced anxiety levels by the end of the study (Edwards et al., 2021). A meta-analysis examining the effectiveness of VR applications in nursing education indicated that VR is more effective than traditional educational methods (Chen et al., 2020). Another study investigating the use of VR to reduce pain and anxiety following laparoscopic sleeve gastrectomy found that it could effectively alleviate these symptoms in patients (Yesilot et al., 2022). Despite the potential of VR technologies to improve the quality of care in healthcare services, a meta-analysis noted that its clinical application is still in its infancy, with challenges emerging in its implementation. The study underscored the importance of conducting more extensive and comprehensive research to advance the use of VR applications in healthcare (Kouijzer et al., 2023).

Given recent technological advancements, the development and implementation of this promising technology, which is rapidly replacing existing systems and paradigms with noticeably advantageous new solutions, have become crucial (Abbas et al., 2023). In Türkiye, the use of VR applications in surgical processes, clinical practices, and nursing education in the field of surgical nursing has increased significantly in recent years. However, no study has been found in the literature that systematically compiles postgraduate theses prepared with VR applications in the field of surgical nursing in our country. Postgraduate theses using VR applications specifically in surgical nursing have demonstrated their effectiveness in the treatment of different problems. Therefore, this study is important in terms of guiding future research, making a wide range of existing knowledge visible, showing gaps in the literature, understanding the role of VR applications in health services and surgical processes, presenting comprehensive studies and application results, supporting clinical practices and providing a positive impact on the development of solid evidence. This study aims to examine graduate theses conducted in the field of surgical nursing in Türkiye that utilize virtual reality applications.

Research questions

•What is the distribution of postgraduate theses conducted using virtual reality applications in the field of surgical nursing in Türkiye by year?

•What are the research methods and designs used in postgraduate theses conducted using virtual reality applications in the field of surgical nursing in Türkiye?

•On which sample groups were postgraduate theses conducted using virtual reality applications in the field of surgical nursing in Türkiye?

•Are postgraduate theses conducted using virtual reality applications in the field of surgical nursing in Türkiye effective on sample groups?

Methods

Type of Research

In this retrospective literature study, the document analysis method was used to examine postgraduate theses studies using SG applications in the field of surgical nursing.

Research Universe and Sample

The universe of the study consisted of postgraduate theses on SG applications in the field of surgical nursing in Turkey; the sample consisted of theses written in the nursing department between the years 2016 and 2024. A purposive sampling method was used to determine the sample. Postgraduate theses written between the years 2016 and2024 were examined in the study. As a result of

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the database scan, 1109 theses were reached. As a result of the scan, 1013 theses not on nursing, 996 theses not on surgical nursing, and two theses not on surgical patients were excluded from the study. 15 theses registered in the database on surgical nursing that met the inclusion criteria were reached.

Data Collection

The data for the study consists of theses on surgical nursing applications registered at the Institute of Health Sciences between 2016 and 2024 at the Council of Higher Education National Thesis Center. The scanning of the theses evaluated within the scope of this study was conducted between September and October 2024. No year limitation was applied in order to comprehensively scan postgraduate theses. The criteria for the inclusion of theses examined in the National Thesis Center database of the Council of Higher Education were the keywords "Virtual Reality", "Virtual Reality Glasses", and "Nursing" in the thesis titles, and they were conducted by the Departments of Surgical Nursing.

Inclusion Criteria

•Postgraduate theses (master's or doctoral) conducted in Türkiye,

•Studies conducted specifically in the field of surgical nursing,

•Theses that involve the use of virtual reality (VR) applications,

•Theses written in Turkish or English,

•Theses published between 2016 and 2024.

Exclusion Criteria

•The theses that are not accessible in full text through the Council of Higher Education Thesis Center,

•Duplicate records or irrelevant topics based on title/abstract review.

The data collection form consisted of 5 items, including the type of research, year, method, sample group, and access to full text. The theses were examined in chronological order after being divided into master's and doctoral theses. The study was methodologically structured according to the PRISMA statement checklist (Figure 1).

Ethical Consideration

In this study, since it was conducted by accessing publicly available master's and doctoral theses, ethical approval was not required.

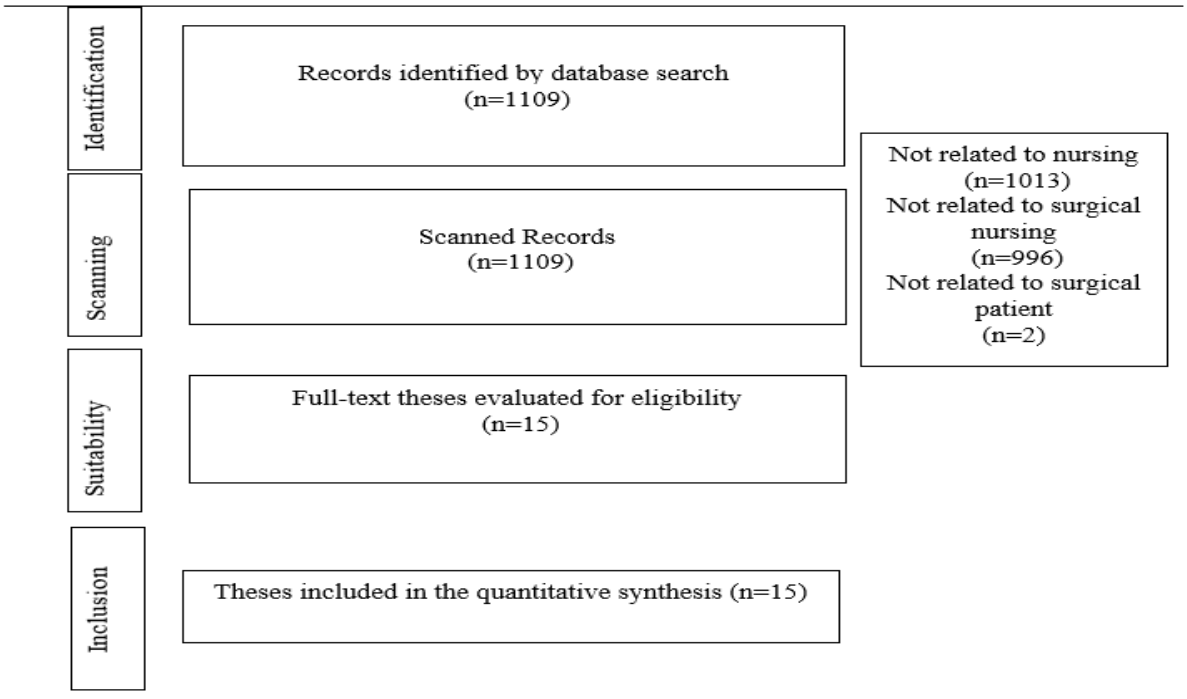

Figure 1. PRISMA Flow Chart

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Results

The study includes 15 theses that meet the inclusion criteria from the years 2016 to 2024. It was found that 33.00% of these theses were conducted in 2021. Of the theses, 67.00% were master's theses and 33.00% were doctoral theses. Patients comprised all the sample groups in these studies. When the study designs were examined, it was revealed that all of them were conducted using experimental designs. Most theses were focused on applications during anesthesia, biopsy, burn treatment, and wound care (Table 1).

Table 1. Distribution of theses according to their characteristics

Characteristic	Number of Theses	Percentage
Years		
2016	1	7.0
2021	5	33.0
2022	3	20.0
2023	4	27.0
2024	2	13.0
Graduate Level		
Master	10	67.0
Doctorate	5	33.0
Sample group		
Patient	15	100
Study Design		
Experimental	15	100
Study group		
Biopsy (breast, prostate)	3	20.0
Anesthesia	3	20.0
Burn/Wound care	2	13.0
General Surgery	3	20.0
Cardiovascular Surgery	1	7.0
Orthopedics	1	7.0
Neurosurgery	1	7.0
Urology	1	7.0

Three experimental studies investigated the effects of virtual reality (VR) applications during biopsies on pain, anxiety, and patient satisfaction (Genç, 2021; Karaman, 2016; Toraman, 2022). One thesis examining the impact of VR on pain and anxiety levels in patients undergoing fine needle aspiration biopsy for breast cancer found statistically significant reductions in pain and state anxiety scores compared to the control group (Karaman, 2016). Another study evaluating the effectiveness of VR goggles during transrectal prostate biopsy concluded that VR significantly reduced pain and anxiety levels and increased patient satisfaction (Toraman, 2022). Additionally, the study by Genç (2021) found that using VR goggles and a stress ball during transrectal prostate biopsy effectively reduced pain and positively influenced vital signs (Genç, 2021).

Three experimental studies examined the effects of virtual reality goggles on pain, anxiety, physiological parameters, and post-spinal headache during surgical procedures with spinal and local anesthesia (Çelik, 2023; İcat, 2023; İnce, 2022). The findings indicate that the use of VR goggles during spinal anesthesia reduced pain and anxiety, with positive effects on vital signs (Çelik, 2023). İnce (2022) found that VR goggles were effective in reducing pain, anxiety, and post-spinal headache and in increasing oxygen saturation levels during the postoperative period (İnce, 2022). The study by İcat (2023) showed that VR goggles reduced anxiety and positively influenced all physiological parameters except heart rate during emergency surgery with local anesthesia. It was concluded that VR goggles are an easy-to-use, non-pharmacological, non-invasive, cost-effective, and effective method (İcat, 2023).

In studies investigating the use of VR goggles during burn and wound care, the effects on pain and anxiety were evaluated (Görücü, 2023; Günaydın, 2021). The use of VR goggles was reported to reduce patients' pain, anxiety, and pain-related anxiety (Görücü, 2023; Günaydın, 2021).

In the field of general surgery, the effects of VR on vital signs, pain, anxiety, comfort, and care satisfaction were examined in patients undergoing laparoscopic cholecystectomy (Öskan, 2022), thyroid-parathyroid surgery (Yılmaz, 2023), and laparoscopic abdominal surgery (Okutan, 2021). Training with VR goggles was found to reduce pain and anxiety and positively affect vital signs in patients undergoing laparoscopic cholecystectomy (Öskan, 2022). VR was effective in reducing pain and increasing comfort and care satisfaction after thyroid-parathyroid surgery (Yılmaz, 2023). The application of VR after laparoscopic abdominal surgery was found to reduce pain and discomfort and positively influence vital signs (Okutan, 2021). Similarly, the effects of VR were examined before open-heart surgery (Erol Akar, 2023), during shock wave lithotripsy (Kütük, 2024), before total knee arthroplasty (Güneş, 2021), and after lumbar canal stenosis surgery (Kaya, 2024). VR was found to reduce surgical anxiety and pain in cardiac surgery, decrease pain and anxiety in lithotripsy, reduce pain and anxiety and positively affect vital signs in knee arthroplasty, and positively influence body

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temperature and systolic blood pressure after lumbar canal stenosis surgery (Erol Akar, 2023; Güneş, 2021; Kaya, 2024; Kütük, 2024) (Table 2, Table 3).

Discussion

It is expressed that the future health system will allow the seamless integration of digital health information into routine clinical practice in the coming years and will transform healthcare practices. The integration of rapidly advancing augmented reality (AR) and virtual reality (VR) applications into clinical practice will lead to better service delivery and improved medical outcomes. These technologies provide support for a smoother learning experience in both patient care and training of healthcare professionals during surgical processes. Additionally, their accessibility and cost-effectiveness contribute positively to economic impacts, enhanced training, skill development, and the potential to improve the quality of life for patients worldwide (Desselle et al., 2020; Rizzetto et al., 2020).

Table 2. Summary of Master's Degree Nursing Theses on Virtual Reality

Author, Year	Type of Thesis	Aim of the Thesis	Method	Conclusion
Karaman, 2016	RCT	To determine the effect of VR on pain and anxiety levels during breast biopsy procedures.	30 patients in the experimental group and 30 in the control group, with VR images shown to the experimental group.	VR application during breast biopsy effectively reduced pain and anxiety levels.
Günaydın, 2021	RCT	To determine the effect of VR goggles on pain during burn dressings for patients in a burn unit.	30 patients with VR goggles watching relaxing videos, compared to 30 control patients.	VR goggles reduced pain during burn dressings, increased patient satisfaction, and decreased stress.
İnce, 2022	RCT	To determine the effect of VR on pain, anxiety, physiological parameters, and post-spinal headache in patients with spinal anesthesia.	40 patients in the VR group and 40 in the control group, with VR images shown to the experimental group.	VR was effective in reducing pain, anxiety, and post-spinal headache, and in increasing oxygen saturation levels.
Toraman, 2022	RCT	To determine the effect of VR goggles on pain, anxiety, and patient satisfaction during transrectal prostate biopsy.	35 patients with VR goggles compared to 35 control patients.	VR goggles were effective in reducing pain and anxiety and improving patient satisfaction during the procedure.
Öskan, 2022	RCT	To determine the effect of VR training on vital signs, pain, and anxiety in patients undergoing laparoscopic cholecystectomy.	31 patients with VR training, 31 with brochure-based training, and 31 controls.	VR training reduced pain and anxiety more than brochure training and had a positive effect on vital signs.
Çelik, 2023	RCT	To determine the effect of VR on pain, anxiety, and vital signs during spinal anesthesia in hernia patients.	55 patients with a VR application compared to 55 control patients.	VR reduced pain and anxiety and had a positive effect on vital signs during the surgical procedure.
Yılmaz, 2023	RCT	To examine the effect of VR on pain management, comfort, and patient satisfaction in patients undergoing thyroid-parathyroid surgery.	35 patients with VR compared to 34 control patients.	VR was helpful in pain management and improving comfort and satisfaction in thyroid-parathyroid surgery.
Erol Akar, 2023	RCT	To evaluate the effect of VR video on surgical fear and anxiety in patients undergoing open heart surgery.	45 patients with VR video and 45 control patients.	VR video reduced surgical fear and anxiety before open heart surgery.
İcat, 2023	RCT	To determine the effect of VR goggles on anxiety during emergency surgery with local anesthesia.	69 patients with VR goggles compared to 69 control patients.	VR goggles reduced anxiety and positively affected physiological parameters other than heart rate.
Kütük, 2024	RCT	To investigate the effect of VR on pain intensity and anxiety levels during shock wave lithotripsy.	36 patients with VR application and 36 control patients.	VR reduced pain intensity and anxiety levels during shock wave lithotripsy.

RCT: Randomized Controlled Trial; SG: Virtual Reality

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In theses involving virtual reality applications in biopsy procedures, it has been reported that VR has positive effects on pain, anxiety, and patient satisfaction (Genç, 2021; Karaman, 2016; Toraman, 2022). Prabhu et al. examined the effects of VR application on anxiety and pain during breast biopsies with 60 patients. The study found that the intervention group had significantly lower anxiety levels, 85.7% of participants were very satisfied, but there was no difference in pain scores (Prabhu et al., 2024). In the study by Sewell et al. (2023), a randomized clinical trial involving 83 participants was conducted to evaluate the effectiveness of a virtual reality intervention in reducing pain and anxiety during hysteroscopy. At the end of the study, no significant difference was found in pain scores between the VR and control groups, but anxiety scores were lower in the VR group (Sewell et al., 2023). Similarly, another study investigated the effect of VR glasses on pain during transrectal prostate biopsies. The study reported that VR glasses significantly reduced pain levels during the biopsy, no side effects were noted from the VR application, and its tolerability was excellent (De Luca et al., 2021). Another study examined the effect of VR glasses on pain during transrectal prostate biopsy. At the end of the study, it was stated that VR glasses significantly reduced pain levels during biopsy, no side effects were observed due to VR application, and tolerability was excellent (De Luca et al., 2021). Different studies have also reported that VR applications are similarly effective in reducing pain levels and anxiety (Deo et al., 2021; Pelazas-Hernández et al., 2023; Korkmaz and Guler, 2023). VR applications show that they are effective in reducing the pain experienced by patients during biopsy. However, fewer studies have reported that VR applications do not make a significant difference in reducing pain. Therefore, higher quality, large-sample randomized controlled trials with standardized protocols are needed to more clearly demonstrate the effectiveness of VR in pain management during biopsy.

Table 3. Summary of Doctoral Degree Nursing Theses on Virtual Reality

Author, Year	Type of Thesis	Aim of the Thesis	Method	Conclusion
Güneş, 2021	RCT	To determine the effects of a virtual reality (VR) application on pain, anxiety, and vital signs before total knee replacement surgery.	Patients were divided into 65 experimental (VR), 65 control, and 65 control groups.	VR application before total knee replacement surgery was found to reduce pain and anxiety and positively affect vital signs.
Okutan, 2021	RCT	To determine the effects of virtual reality (VR) and music on patients' vital signs, pain, and comfort after laparoscopic abdominal surgery.	Patients were divided into three groups: 75 VR, 75 music, and 75 control.	Both VR and music applications reduced pain and discomfort after laparoscopic abdominal surgery and had a positive effect on vital signs.
Genç, 2021	RCT	To determine the effects of VR goggles and stress ball squeezing on pain and vital signs during transrectal prostate biopsy (TRUS-Bx).	Patients were divided into 32 VR, 32 stress ball, and 32 control groups.	VR goggles and stress ball squeezing reduced pain and positively affected vital signs during TRUS-Bx.
Görücü, 2023	RCT	To determine the effects of VR and music on pain, anxiety, and pain anxiety during burn patient care.	Patients were divided into three groups: 40 VR, 40 music, and 40 no application.	Both VR and music applications were effective in reducing pain, anxiety, and pain anxiety during burn care.
Kaya, 2024	RCT	To investigate the effects of VR applications on patients' vital signs, pain, and comfort levels after lumbar stenosis surgery.	Patients were divided into 42 VR and 42 control groups.	VR application did not affect vital signs, pain, and comfort levels after lumbar stenosis surgery, except for body temperature and systolic blood pressure.

RCT: Randomized Controlled Trial; SG: Virtual Reality

In the context of anesthesia, theses involving VR applications have shown positive effects on pain, anxiety, physiological parameters, and post-spinal headache (Çelik, 2023; İcat, 2023; İnce, 2022). A study examining the effects of VR on patient anxiety under regional anesthesia found significant reductions in perioperative anxiety levels. However, there were no significant differences in vital signs, side effects, and overall satisfaction compared to the control group (Arifin et al., 2023). Wu et al. investigated the effects of VR applications used in preoperative preparations for children undergoing general anesthesia. It was concluded that VR applications used as a preparation tool for elective surgeries had positive effects on anxiety, induction compliance, and parent satisfaction (Wu et al.,

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2022). In the study conducted by Tippelt et al. (2024), the effect of VR application on anxiety and fear was investigated in patients who underwent surgery in the head and neck region under local anesthesia. Patients who had VR headsets during local anesthesia injection and those who had headsets after injection were compared, and it was determined that the first group had lower intraoperative anxiety scores than the second group, but there was no statistically significant difference. No significant effect was observed in terms of intraoperative pain. In the study, anxiety levels were examined in terms of surgical area and neck, ear, mouth, intranasal and other areas were compared. However, VR use did not yield significant results in terms of anxiety for different areas. At the end of the study, 71.7% of the patients reported that they would be less anxious for a future surgery using a VR headset and 86.6% of them would recommend the use of a VR headset to other patients (Tippelt et al., 2024). As a result of the study results, it can be concluded that the use of VR applications as a distraction method during local or regional anesthesia can reduce patient anxiety. However, it should be used appropriately in terms of sterilization for use in the intraoperative period.

Theses on the use of VR glasses during burn and wound care have identified positive effects on pain and anxiety (Görücü, 2023; Günaydın, 2021). A meta-analysis including 30 studies and 1,293 patients examined the effect of VR applications on pain during wound care in burn patients. The study reported that patients in the VR application group experienced significantly lower pain intensity compared to the control group. The study concluded with recommendations for policymakers and administrators to provide and use VR devices in patient care (Norouzkhani et al., 2022). Another systematic review by He et al. (2022) reported that VR applications in wound care could reduce pain scores, pain cognition scores, pain affect scores, pain sensation scores, and blood pressure (He et al., 2022). A meta-analysis evaluated the effectiveness of VR applications in reducing pain during wound care in burn patients. At the end of the study, it was reported that VR applications reduced the pain of twenty-two patients receiving care for burn wounds, increased the pain of one patient, and did not affect the pain of seven patients. The study stated that immersive VR applications significantly reduced pain intensity, but non-immersive VR applications did not have a statistically significant effect on pain intensity (Norouzkhani et al., 2022). Virtual reality applications, especially when immersive ones are used, generally stand out as an effective method in reducing pain in burn and wound care.

Positive effects of VR applications have been examined in various surgical fields, including general surgery, open-heart surgery, urology, total knee replacement surgery, and lumbar spinal stenosis surgery (Erol Akar, 2023; Güneş, 2021; Kaya, 2024; Kütük, 2024; Okutan, 2021; Öskan, 2022; Yılmaz, 2023). A systematic review of the effects of VR applications on postoperative pain in hemorrhoidectomy, dental surgery, craniotomy/spinal surgery, episiotomy repair, and knee surgery patients showed that patients receiving VR interventions had lower postoperative pain scores compared to those receiving standard care. Significant improvements in postoperative satisfaction were reported in two studies (Ding et al., 2020). Another meta-analysis including 2,555 studies on the impact of VR applications in preoperative planning for brain and nerve surgery patients found statistically significant differences in surgical duration, fluoroscopy time, blood loss, and complication rates across four randomized controlled trials. The study highlighted the positive impact of VR on surgical strategy, anatomical visualization, validity, reliability, surgeon confidence, and applicability (Lan et al., 2023). The effect of VR applications on the anxiety and satisfaction of patients undergoing hand surgery was investigated. At the end of the study, it was stated that diastolic blood pressure and heart rate were significantly lower in the VR group compared to the control group, but there was no difference between the groups in terms of anxiety and satisfaction (McConnell et al., 2025). Similarly, the effect of VR applications on pain and anxiety was investigated in patients who had cardiac surgery. In the study, although the anxiety level in the VR group was statistically significantly lower, there was no significant difference in terms of pain. (Micheluzzi et al., 2024)

When the studies were examined, although VR applications created the desired effect in most studies, they were found to be ineffective in some studies. It is thought that this situation may be due to the nature and type of VR applications, the duration and time of application, the differences in patient characteristics, objective and subjective measurement differences, and the sample size. In this context, the results evaluating the effectiveness of VR applications should be interpreted within the framework of the methods and conditions used.

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DOI:1038108/ouhcd.1623029

Conclusion and Recommendations

The review of postgraduate theses revealed that virtual reality applications are effective in reducing pain and anxiety in patients undergoing invasive procedures such as biopsies within the field of nursing. In patients receiving local or regional anesthesia, VR not only alleviated pain and anxiety but also had a positive impact on physiological parameters. Similarly, the use of VR headsets during burn and wound care was found to significantly reduce pain and anxiety levels. In various surgical procedures, VR interventions demonstrated beneficial effects on vital signs, pain, anxiety, comfort, and overall care satisfaction. These findings suggest that, given the integral role of nurses in the perioperative care process, integrating VR technologies into clinical practice can enhance both patient outcomes and care quality. Therefore, it is recommended that the use of VR in nursing be expanded, incorporated into nursing education curricula, and promoted through increased awareness and further research in the field.

Ethics Committee Approval: In this study, since it was conducted by accessing publicly available master's and doctoral theses, ethical approval was not required.
Peer-review: External referee evaluation.
Author Contributions: Idea/concept: GMB; Design: GMB; Consultancy: GMB; Data collection and/or Data Processing: GMB; Analysis and/or Interpretation: GMB; Literature Review: GMB; Manuscript Writing: GMB; Critical review: GMB.
Conflict of interest: The authors declare that they have no conflict of interest.
Financial Disclosure: No financial support has been received for this research.

What did the study add to the literature?

- The findings of this research demonstrated virtual reality applications are effective according to their usage purposes.
- It facilitates adaptation processes by reducing anxiety in patients' preparation for the surgical process. It also provides cost-effective and time-saving opportunities.
- The use of virtual reality applications in surgical processes will be an important tool in improving the quality of patient care by integrating technology into clinics.

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