ATATÜRK ÜNİVERSİTESİ YAYINLARI
ATATURK UNIVERSITY PUBLICATIONS

Research Article *Araştırma Makalesi* DOI: 10.17049/jnursology.1542753

Orthopedic and Trauma Nurses' Experiences of Caring for Patients Undergoing Extremity Surgery Due to Trauma: A Qualitative Study

Ortopedi ve Travmatoloji Hemşirelerinin Travma Nedeniyle Ekstremite Cerrahisi Uygulanan Hastalara Bakım Verme Deneyimleri: Nitel Bir Çalışma

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ABSTRACT

Objective: This study investigated orthopedic and trauma nurses' experiences of caring for patients undergoing extremity surgery due to trauma.
Methods: This study adopted a descriptive and qualitative research design. The sample consisted of 11 nurses working in the Orthopedic and Traumatology Clinic of a public hospital in Ankara, where trauma patients are primarily admitted. The determination of the sample size was based on data saturation. Data were collected online (Zoom) using a semi-structured interview guide. Thematic content analysis was used for data analysis.
Results: The data were grouped under four themes. The themes were Differences in Care, Competencies in Care, Areas of Improvement in Care, and Challenges Faced by Patients in the Eyes of Nurses.
Conclusion: The results showed that our participants were aware of the care needs of patients after trauma surgery. Especially, nurses emphasized that nursing care of orthopedic trauma patients is more complex than that of other orthopedic patients. These results suggest that nurses need training specifically for the care of trauma patients and that different studies should be conducted to evaluate patient outcomes and nurse experiences after training.

Keywords: Trauma, trauma nursing, nurse experiences, orthopedic trauma, qualitative research

ÖZ

Amaç: Bu çalışma, travma nedeniyle ekstremite cerrahisi geçiren hastalara bakım veren ortopedi ve travma hemşirelerinin deneyimlerini incelemiştir.
Yöntem: Tanımlayıcı nitel araştırma deseni kullanılmıştır. Örneklem, travma hastalarının öncelikli olarak kabul edildiği Ankara'daki bir devlet hastanesinin Ortopedi ve Travmatoloji Kliniğinde çalışan 11 hemşireden oluşmuştur. Örneklem büyüklüğü veri doygunluğuna göre belirlenmiştir. Veriler, yarı yapılandırılmış görüşme formu kullanılarak çevrim içi (Zoom) ortamında toplanmış; analizde tematik içerik analizi yöntemi uygulanmıştır.
Bulgular: Veriler dört tema altında toplanmıştır: Bakımda Farklılıklar, Bakımda Yetkinlikler, Bakımda Gelişim Alanları ve Hemşirelerin Gözünden Hastaların Karşılaştığı Zorluklar.
Sonuç: Bulgular, hemşirelerin travma cerrahisi sonrası hastaların bakım gereksinimlerinin farkında olduklarını göstermiştir. Özellikle, ortopedik travma hastalarının hemşirelik bakımının diğer ortopedi hastalarına kıyasla daha karmaşık olduğunun altı çizilmiştir. Sonuçlar, travma hastalarının bakımına yönelik özel hemşirelik eğitimine gereksinim olduğunu ve bu eğitimin ardından hasta sonuçları ile hemşire deneyimlerinin değerlendirilmesine yönelik farklı çalışmalar yapılması gerektiğini ortaya koymaktadır.
Anahtar Kelimeler: Travma, travma hemşireliği, hemşire deneyimleri, ortopedik travma, nitel araştırma

This study was presented as an "oral presentation" at the 4th International 12th National Turkish Surgical and Operating Room Nursing Congress held in Antalya between January 13 and 16, 2022.

Geliş Tarihi/Received	03.09.2024
Revizyon Talebi/Revision Requested	22.05.2025
Son Revizyon/Last Revision	03.06.2025
Kabul Tarihi/Accepted	30.06.2025
Yayın Tarihi/Publication Date	17.09.2025

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Cite this article: Güler S, Akarsu K, Bulut H. Orthopedic and Trauma Nurses' Experiences of Caring for Patients Undergoing Extremity Surgery Due to Trauma: A Qualitative Study. *J Nursology*. 2025;28(3):294-302. doi:10.17049/jnursology.1542753

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INTRODUCTION

Trauma is reported as one of the leading causes of death and disability in developed countries, particularly among individuals aged 15–44 years, and it is also associated with a significant economic burden due to direct healthcare costs and lost productivity.[1-5] Trauma-related orthopedic injuries typically result from falls, motor vehicle accidents, and acts of violence, contributing significantly to mortality, morbidity, and long-term disability, and account for approximately 50% of injury-related deaths worldwide.[2,5] Studies conducted in the United States, China, and Italy have consistently identified trauma as the leading cause of death among young and middle-aged adults.[1,6,7] According to the World Health Organization (WHO), approximately 1.19 million people die annually due to traffic accidents, while 360,000 die as a result of work-related accidents.[8,9] In Türkiye, the General Directorate of Security reported 485,048 accidents in 2022, resulting in 2,282 deaths and 291,151 injuries.[10] Although these absolute numbers are lower than global figures, when adjusted for population size, traffic and occupational accidents remain a major public health concern in Türkiye, reflecting patterns observed worldwide. Extremity fractures are among the most common traumatic injuries both globally and in Türkiye.[11,12] According to the 2020 report of the Social Security Institution (SSI), 138,593 individuals sustained upper extremity trauma and 71,230 sustained lower extremity trauma due to occupational accidents, while 525 individuals experienced limb or organ loss.[13] These figures indicate that trauma and trauma-related extremity fractures represent a significant health issue in Türkiye, consistent with international trends. Overall, these data highlight the significance of trauma and underscore the necessity of preventive measures as well as effective care strategies at both national and international levels.

It is stated that patients who undergo trauma-related fracture surgery experience problems such as pain, limitation of mobility, and disability after surgery, and accordingly, anxiety and depression may develop in individuals.[14,15] The reasons such as the fact that trauma-related extremity surgery patients are mostly young, create an economic and psychological burden, many traumas result in death and disability, and constitute a common patient group in clinical care, increase the importance of trauma-related extremity surgery clinical care.[1,16]

The postoperative nursing care process for orthopedic trauma patients is difficult and complex. The reasons for these difficulties are the sudden development of trauma, the lack of preparedness of the patient and his/her family for the surgical process, the risk of limb loss or limb loss, sudden complication development, and the need for serious effort for postoperative follow-up.[12,17] In our experience, in parallel with the literature, it was observed that patients and their relatives were in shock by the trauma they experienced, could not be adequately prepared for the surgical process, and therefore had difficulty in process management and adaptation to their own care and treatment. Therefore, nurses need to make extra effort to include patients and their relatives who have undergone trauma-related extremity surgery in the process and to ensure their adaptation, apart from treatment and care. Our literature review found no study examining orthopedic nurses' views on the patient group undergoing trauma-related extremity surgery. However, there are studies in the literature on the experiences of intensive care nurses in caring for all traumatized patients without discrimination and the experiences of nurses working with trauma patients in critical care, accident, and emergency settings.[17,18] In another study, posttraumatic recovery indicators were compared by patients, family members, and clinicians.[16] However, the majority of trauma patients are followed up in orthopedic and traumatology clinics. It is known that the care provided by orthopedic and trauma nurses is important in both acute and postoperative periods.[1,12]

The opinions of orthopedic and trauma nurses in the care process of trauma patients are of great importance not only in terms of patient safety and comfort, but also in terms of treatment effectiveness and prevention of complications.[1,12] Nurses' knowledge, skills, clinical observation, and communication skills directly affect the quality of recovery after trauma. Therefore, taking nurses opinions into consideration in the care of trauma patients is necessary to improve the quality of health services.[1,4]

In the literature, studies addressing nursing experiences in the care of trauma patients are mostly limited to nurses working in intensive care, emergency, and critical care units.[16-18] However, patients undergoing trauma-related extremity surgery are primarily followed up in orthopedic and traumatology clinics, and no studies have been found regarding the care experiences of nurses working in these units. Therefore, examining the experiences of orthopedic and trauma nurses in caring for this specific patient group will fill an important gap in the literature.

AIM

This study aims to address this gap and contribute to the improvement of nursing care for patients with extremity trauma. It is thought that the results of this study will contribute to the nursing care of patients with extremity trauma.

METHODS

Study Design

The situations that orthopedic nurses encounter with trauma patients in daily practice, the relationships they establish with patients, the difficulties they encounter, and the coping strategies they develop in these processes are too deep, subjective, and contextual to be explained only by numerical data. Such experiences are based on individuals' experiences and the meanings they attribute to these experiences. For this reason, the phenomenological method offers an in-depth look at the care needs, needs, and difficulties of trauma patients from a professional perspective through the eyes of nurses who are with them 24/7 and observe them most closely. Therefore, in this study, a descriptive and qualitative research design was adopted to examine the experiences of orthopedic and trauma nurses in depth, and a phenomenological approach was used in the research design. Phenomenological studies aim to gain a deeper understanding of people's experiences by revealing the essence or basic structure of any phenomenon under investigation.[19,20] The research was conducted through semi-structured interviews. Data were analyzed using thematic content analysis. The Consolidated Criteria for Reporting of Qualitative Research (COREQ) was used as the basis for reporting the Research.[21]

Participants

The study sample consisted of 11 nurses working in the Orthopaedics and Traumatology Clinic of a training and research hospital in Ankara where trauma patients are primarily admitted. The inclusion criteria were to agree to participate in the study, to be equipped to use the Zoom programme and to have been working in the orthopaedics and traumatology clinic for at least 6 months. One of the participants was male and the others were female. The mean age of the participants was 32.3 years (min 24/max 47). The majority of the participants had a bachelor's degree. The mean working experience of the participants in the orthopaedics and trauma service was 42.2 months (min 7 months/max 13 years) (Table 1). Purposive sampling method was used in the study. The determination of the sample size was based on data saturation.[22,23] Twelve nurses who met the criteria for inclusion in the sample were invited, and the nurses were informed about the study. Interviews were conducted with the nurses who agreed to participate in the study, and repeated responses were received from the fourth participant. Participant recruitment was stopped when the data reached saturation at 11 participants. To ensure diversity in experiences, particular attention was paid to forming a heterogeneous sample during participant selection. Accordingly, nurses from different age groups, genders, marital statuses, and parental statuses were included in the study. In addition, the variation in the length of professional experience of the participating nurses in the field of orthopedic and trauma nursing was also taken into account. This allowed the perspectives of both nurses with shorter and longer professional experience to be reflected in the study. Since individuals' demographic characteristics and professional backgrounds influence their ways of interpreting events and experiences, this diversity contributed to the variation in viewpoints and aimed to present the research findings in a more comprehensive manner.

Table 1. Demographic Variables

Participants	Sex	Age (X̄±SD 29.90±8.59)	Education	Clinical Nursing Experience (Total) (X̄±SD 84.81±113.61 month)	Experience (Orthopedics and Traumatology Clinic) (X̄±SD 42.27±44.96 month)
Nurse 1	Female	25	Undergraduate	15 Months	15 Months
Nurse 2	Female	25	Undergraduate	8 Months	8 Months
Nurse 3	Female	27	Undergraduate	3 Years	3 Years
Nurse 4	Female	24	Undergraduate	7 Months	7 Months
Nurse 5	Female	24	Undergraduate	15 Months	15 Months
Nurse 6	Male	46	Undergraduate	19 Years	13 Years
Nurse 7	Female	27	Associate Degree	5 Years	5 Years
Nurse 8	Female	27	Undergraduate	5 Years	2 Years
Nurse 9	Female	24	Undergraduate	1 Years	1 Years
Nurse 10	Female	47	Undergraduate	30 Years	4 Years
Nurse 11	Female	33	Undergraduate	11 Years	7 Years

X̄, Aritmetik ortalama; SD, Standart sapma

Procedure/Data Collection

A semi-structured descriptive information form and an interview form prepared by the researchers were used in the interviews. In the orthopedic and traumatology clinic, nurses were informed about the study, and informed consent was obtained from the nurses who agreed to participate in the study. Nurses who agreed to participate in the study were called by phone to determine the day and time they were available for the interview. The interviews were completed one by one as individual interviews via the Zoom platform (Zoom™). Individual interviews were completed between 10 February 2021 and 21 March 2021. All 3 researchers are experienced in qualitative research. The first and second researchers had clinical nursing experience in orthopedic and traumatology. The interviews were video-recorded with the permission of the participants so that the reactions and moods of the nurses could be monitored repeatedly. Conducting the interviews on the Zoom platform (Zoom™) allowed the participants to use a space where they could be comfortable and alone, and the video recordings allowed the researchers to monitor the participants behaviors repeatedly. In the interviews, nurses' experiences of caring for trauma patients, areas where nursing care given to patients undergoing extremity surgery is adequate and needs to change, areas where trauma nurses need to strengthen themselves, and their views on the difficulties experienced by trauma patients after surgery were questioned with semi-structured open-ended questions (Table 2). Mean interview length was 51 minutes (37 to 68).

Table 2. Semi-structured Individual Interview Questions

Q1.Could you please describe what was your experience of caring for patients who underwent extremity surgery due to trauma in the orthopedics and traumatology clinic?
Q2.What do you think are the areas where nursing care for patients who have undergone extremity surgery due to trauma in the orthopedics and traumatology clinic is adequate?
Q3.Which of the current nursing practices after extremity surgery due to trauma in the orthopedics and traumatology clinic do you think should be changed and why?
Q4.In what ways do you think orthopedics and traumatology nurses should improve or strengthen themselves in the care of patients who have undergone trauma surgery?
Q5.What do you think are the difficulties these patients experience after surgery?

Data Analysis

The data obtained from the research were analyzed in four stages: (1) coding the data, (2) finding codes and themes, (3) organizing the codes and themes, and (4) describing and interpreting the findings according to thematic content analysis.[24] In the first stage, the records were transcribed and transcribed verbatim. In the second stage, the transcripts were read multiple times independently by 3 researchers to minimize the risk of error. After repeated reading, contextual analyses were performed by highlighting meaningful sentences and expressions. Expressions found important in contextual analyses were selected, and the content was formulated. In the third stage, all authors agreed on the codes and themes through mutual discussions and opinions. An external expert with qualitative study and analysis experience evaluated the findings in terms of scope and richness. In the last stage, the themes and sub-themes were revised, defined and interpreted by the three authors after the suggestion according to the thematic content analysis of the findings. By reaching a consensus, the nurse expressions that make up the codes and themes were determined. The findings were verified with feedback from the participants.

Precision and Reliability of Study Data

The rigor of the research was achieved through the triad of reliability, transferability, and verifiability proposed by Lincoln and Guba.[25] Reliability was achieved by clearly informing the participants about the study, ensuring transparency with the participants, and audio and video recording the interviews as well as taking notes by the researcher during the interviews. Transferability was ensured by quoting the findings from the participants' own statements. After the participants' statements were transcribed, accuracy was ensured by obtaining their approval. Verifiability was ensured by following the COREQ checklist. During the data collection and data analysis stages, the research team had continuous interaction and information sharing.[19]

Ethical Considerations

Ethical approval was obtained from the Lokman Hekim University Ethical Review Board before conducting the study (Code No. 2021007, Date: January 19, 2021). In addition, written permission was obtained from the chief physician of the institution where the study was conducted. Written and verbal consent were obtained from all participants. In the interviews, the statements of the nurses were stated as "N1, N2," and the names of institutions or individuals were not included in the statements.

RESULTS

Orthopedic and trauma nurses agree that care of patients with trauma is more complex and challenging compared to other orthopedic patients. Nurses state that the care of patients with orthopedic trauma differs and that they are both competent in this field and aware of the aspects that need to be developed. In this direction, the data obtained

in the study were classified under four main themes: Differences in Care, Competencies in Care, Areas for Improvement in Care and Challenges Faced by Patients from the Nurses' Perspective (Table 3). In this section, participant statements related to each theme are given.

Table 3. Themes and Subthemes

Themes	Subthemes	Code	Total Frequency
Differences in Care	Unprepared patient	Unresponsive (1) Burnout (1) Psychological problems (6)	8
	Prepared patient	Psychological readiness (2) Physiological preparation (3)	5
Competencies in Care	Patient follow-up	Postoperative reception (4) Drug administration (2)	6
	Pain management	Pain (9) Pain control (2)	11
	Patient safety	Fall (3) Infection (5)	8
Areas of Improvement in Care	Psychological support	Psychological support (5) Emotional support (2)	7
	Time allocated for a patient	Nursing care (10)	10
	Constant training	Training in trauma patient care (9) Patient training (5)	14
Challenges Experienced by Patients from a Nurse's Perspective	Immobilization	Bedridden (1) Restriction of movement (2) Impaired mobilization (2)	5
	Excretory problems	Toilet needs (4) Powerlessness (1)	5
	Pain	Pain (6) Pain tolerance (1) Pain threshold (1)	8
	Adaptation	Adaptation problems (2)	2
	Gaps in knowledge	Gaps in knowledge (4)	4
	Anxiety	Aggressive (1) Fear (4) Demoralization (2)	7
	Sleep problems	Sleep deprivation (3) Sleep Pattern (2)	5
	Disruption in family processes	Family (4)	4

Theme 1: Differences in Care

Under the theme of differences in care, two sub-themes were identified: "Unprepared patient" and "Planned patient". The nurses emphasized that trauma patients are especially psychologically different from planned patients, that they experience surgical trauma because they are unprepared for their surgeries, and that they can remain unresponsive as if they are cut off from life.

"...psychologically there is a big difference. You know, the care of a normal platinum surgery and a traumatized person is not the same at all. For one thing, the companions are different, the patient is traumatized, and the relatives are traumatized" (N5).

"... patients who come from the outpatient clinic as planned are actually preparing themselves for surgery ... but trauma patients are different because it is something that develops suddenly, their approach to the hospital, their attitude towards us is completely different, so I can say there is a gap" (N8).

"They are unresponsive as if they are detached from life, they do not react. For example, he doesn't even extend his arm while taking his blood pressure. ...they are hospitalized but no psychological care is provided. There is no psychiatric support in any way, there is burnout" (N3).

Theme 2: Competencies in Care

Nurses stated that they considered themselves competent, especially in patient safety, patient monitoring, and pain management in the care of traumatized patients. When the nurses' statements are examined, it is seen that the nursing care or practices considered adequate are mostly medical care. Areas considered adequate in care:

"Pain management, then infection management, I think those two points" (N3).

"I think nurses are more experienced in pain and infection. Because we can only spare time for them" (N11).

"We follow them closely, we evaluate their risks. Since it is an orthopedic service, it is a clinic with a very high risk of falling, for example, we take precautions against this, we do these practices better" (N1).

"I think the postoperative patient welcome is good enough" (N9).

Theme 3: Areas for Improvement in Care

The nurses stated that due to reasons such as a low number of nurses and high workload, nurses mostly focused on medical treatment and could not spare enough time for nursing care. Nurses stated that providing psychological support, increasing the time allocated to the patient, and providing continuous training are areas of improvement in nursing care and follow-up of patients after surgery.

"...we have neither the environment nor enough time to provide care, nor the number of nurses is sufficient, that is, two nurses work in a clinic with 40 beds. We do not have time to provide care" (N6).

"...such patients should be given psychologically different care. They should be approached differently; we ignore this because of the intensity. We think that just medical treatment is enough" (N8).

"...there are too many patients per nurse, and I cannot deal with them enough, they are emotionally heavier, it is necessary to spare time" (N9).

"...I think the training we receive is very important here. When there is a seminar or congress on orthopedic and trauma, ward nurses can be sent in turn..." (N4).

Theme 4: Challenges Experienced by Patients from a Nurse's Perspective

Nurses stated that patients undergoing trauma extremity surgery experience difficulties such as excretory distress, immobilization, pain, difficulty in adapting to the current situation, sleep problems, anxiety, disruption in family processes, and lack of information.

"After the surgery, they cannot do their self-care, they have trouble going to the toilet, apart from that, they cannot control pain, and the other difficulties they have is when they are discharged from here, will they be able to return to normal life? They have those concerns; their stress is more" (N7).

"I think one of the problems experienced by trauma patients is being bedridden" (N10).

"I mean, restriction of movement is bad; patients are very overwhelmed in this respect. Because it is something that happens suddenly" (N8).

"...For example, even emptying is a big problem for them. I tell them you can do it with a slide; you can be diapered. I can understand even from their facial expressions, even the concept of diapers; they say diapers? They find it difficult. They can see it as 'helplessness', especially young patients" (N2).

"Since there is much pain, no matter how much painkillers you give, it is not enough" (N4).

"They have difficulty coping with pain" (N9).

"I think the adaptation problem is the one they have the most difficulty with. They cannot accept the hospital environment. They cannot accept their current situation. ...psychological adaptation, adaptation to the hospital, they have the most difficulty in this regard" (N3).

"Their sleep patterns are disturbed because they have much pain... It is like the links of a chain... When one starts, it progresses ring by ring" (N5).

DISCUSSION

This study examined the care experiences of orthopedic and trauma nurses with patients who underwent extremity surgery due to trauma. One of the most emphasized points by nurses in the care of these patients is that these patients are different from planned patients; they come unprepared for the surgical process, and this situation traumatizes them more. In addition, nurses emphasized that these patients have more difficulties in the treatment adaptation process than planned patients and that they need psychological support and, therefore, more time should be allocated. In this respect, nurses stated that they needed training on the approach to trauma patients. It is also stated in the literature that emergency surgical patients have clinically different characteristics from planned surgical patients. It is emphasized that because traumatic fracture patients may have serious symptoms, their post-traumatic condition may develop rapidly and various complications may develop as a result of incorrect treatment or intervention.[26] In another study, nurses emphasized that trauma patients are unpredictable and require high concentration.[27]

This study shows that nurses are aware that the needs of patients undergoing trauma-related extremity surgery are different from other orthopedic patients. The nurses emphasized that even in the current situation, they thought that they were doing 'the best they could' for these patients. However, they stated that the time allocated to the care of complicated patients, such as trauma patients, while performing routine tasks was insufficient due to the high number of patients, density, and low number of nurses. For the same reasons, they stated that even if they could provide patient care, they could not apply all the steps of care. Participants especially emphasized that they could complete medical treatment and follow-up. It is inferred from the nurses' statements that this situation creates a sense of inadequacy or inability to do justice to their duties. Nurses stated that trauma patients need special support, especially psychologically, but they do not have sufficient knowledge and experience in this regard. They stated that there was no difference between the care they gave to patients who underwent trauma-related extremity surgery and patients who underwent other orthopedic surgeries because of the lack of sufficient time and nurses and the lack of sufficient knowledge about the approach to trauma patients.

In light of this information, it is clear that one of the critical areas that nurses need to improve in care is education. Nurses frequently stated in their own statements that they

needed training in trauma patient care and patient education. In line with the information given by the nurses, it is seen that they have requests such as receiving in-service training for trauma patients, being sent to congresses in their fields by their institutions, and receiving training from experts to provide adequate patient care. In addition, it was emphasized that in order to provide psychological support to patients in a special unit such as orthopaedic trauma and to provide holistic nursing care for the needs of trauma patients, continuous training specific to the fields should be provided. The importance of providing specialized training to nurses in orthopaedic trauma care is also included in the literature.[18]

Within the scope of their observations and experiences, nurses stated that after trauma-related extremity surgery, patients experienced severe problems such as 'immobilization', 'excretory distress', 'pain', 'inadequacy in the adaptation process', 'lack of information', 'anxiety', 'sleep problems', 'disruption in family processes'. Almost all of the participants gave similar answers to the problems and experiences of the patients. This shows that the nurses are aware of the problems of the patient group undergoing trauma-related extremity surgery. In addition, it is seen that the nurses liken these problems to a chain link that follows each other and think of them as a vicious circle. When the difficulties experienced by patients after trauma extremity surgery are examined in the literature, it is stated that the patient whose pain needs cannot be met has sleep problems, which may lead to anxiety development in the patient.[28-32]

As a result of this study, it was stated that orthopedic and trauma nurses were aware of the care needs of patients after trauma surgery and that this patient group needed psychological support, especially psychologically, more than planned inpatient orthopedic patients. The nurses emphasized that they needed training for trauma patients and that the number of nurses or the care time allocated to the patient should be improved in order to spend more time with the patients. In this study, it is necessary to make plans to give training to nurses for trauma patients, especially including psychological approach, and to evaluate the results of the training.

Expected Clinical Impact of the Study

Understanding Nursing Care in Trauma-Related Surgery

This study provides an in-depth understanding of the nursing care process by revealing the emotional, physical, and ethical dimensions of nurses' experiences while caring for patients undergoing trauma-related extremity surgery. The challenges faced by nurses, their coping strategies, and the therapeutic relationships they establish with patients are evaluated in this context.

Enhancement of Clinical Practices

Findings can directly inform practical nursing applications by identifying areas where nurses require support, such as advanced communication skills, effective pain management, and psychosocial care. Integrating these insights into clinical protocols may increase patient satisfaction, improve care quality, and reduce complications.

Identification of Educational and Training Needs

Data obtained from nurses' experiences can guide the restructuring of nursing curricula and the development of targeted in-service training programs, particularly in the field of post-traumatic surgical care. This will better prepare nurses for the unique challenges of orthopedic trauma patients.

Psychosocial Support and Burnout Prevention

The study highlights psychosocial challenges such as emotional burden, burnout, and compassion fatigue frequently encountered by nurses working with trauma patients. Raising awareness of these issues can support the implementation of institutional strategies to protect nurses' well-being alongside patient care.

Policy and Management Implications

Results may provide evidence-based feedback to healthcare managers and policymakers regarding nursing service organization, workforce planning, and nurse-patient ratios. Such insights can contribute to safer, more supportive, and more effective care environments.

Limitations

This study was conducted in a single unit, which allowed an in-depth exploration of nursing care for trauma patients but limits the generalizability of the findings to other orthopedic and traumatology settings. Conducting interviews online may have led some participants to provide shorter or less detailed responses due to technical challenges or concerns about privacy. Additionally, as the results reflect participants' self-reported experiences and perspectives, they represent subjective views that may vary across individuals.

Future research could expand to multiple units or hospitals to capture a broader range of experiences, and consider mixed-methods designs combining qualitative and quantitative data. Including patients' and families' perspectives alongside nurses' experiences could provide a more comprehensive understanding of trauma care.

This study was conducted in a single institution, which limits the diversity of experiences captured. Future research could include nurses from different geographical regions and a variety of healthcare institutions, such as public, private, and teaching hospitals, to provide a broader perspective.

Employing mixed-methods designs that integrate qualitative and quantitative approaches may offer a more comprehensive understanding of nurses' experiences. For example, themes identified in qualitative interviews could be further explored and validated through surveys with larger samples.

Additionally, examining the experiences of not only nurses but also patients and their families could provide a multidimensional understanding of the care process. Multicenter studies may help capture wider variations in nursing practices and care environments, while longitudinal designs could elucidate the long-term effects of nursing interventions on patient outcomes and nurses' well-being. Finally, the development of evidence-based care models derived from these findings could strengthen both clinical guidelines and nursing education programs.

Etik Komite Onayı: Etik kurul onayı Lokman Hekim Üniversitesi Yerel Etik Kurulu'ndan (Tarih: 19 Ocak 2021, Sayı: 2021007) alınmıştır.
Bilgilendirilmiş Onam: Çalışmaya katılan hemşirelerden yazılı ve sözlü onam alınmıştır.
Hakem Değerlendirmesi: Dış bağımsız.
Yazar Katkıları: Fikir- KA; Tasarım- SG-KA-HB; Denetleme- SG-HB; Kaynaklar- SG-KA-HB; Veri Toplanması ve/veya İşlemesi- SG-KA; Analiz ve/ veya Yorum- SG-KA-HB; Literatür Taraması- SG-KA; Yazıyı Yazan- SG-KA; Eleştirel İnceleme- SG-HB
Çıkar Çatışması: Yazarlar, çıkar çatışması olmadığını beyan etmiştir.
Finansal Destek: Yazarlar, bu çalışma için finansal destek almadığını beyan etmiştir.

Ethics Committee Approval: Ethics committee approval was obtained from Lokman Hekim University Local Ethics Committee (Date: January 19, 2021, Number: 2021007)
Informed Consent: Verbal and written informed consent was obtained from the nurses involved in the study
Peer-review: Externally peer-reviewed.
Author Contributions: Concept -KA; Design- SG-KA-HB; Supervision- SG-HB; Resources- SG-KA-HB; Data Collection and/or Processing- SG-KA; Analysis and/or Interpretation- SG-KA-HB; Literature Search- SG-KA; Writing Manuscript- SG-KA; Critical Review- SG-HB
Conflict of Interest: The authors have no conflicts of interest to declare.
Financial Disclosure: The authors declared that this study has received no financial support.

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