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REVIEW

ORIGINAL ARTICLES

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REVIEW

Non-pharmacological Methods to Prevent Delirium in Pediatric Intensive Care Units: A Systematic Review

Pediyatrik Yoğun Bakım Ünitelerinde Deliryumu Önlemek için Farmakolojik Olmayan Yöntemler: Sistematik Bir İnceleme

İlçim Ercan Koyuncu[1], Duygu Gözen[2]

[1]Department of Child Health and Diseases Nursing Doctorate Programme, Institute of Graduate Studies, İstanbul University-Cerrahpaşa, İstanbul, Türkiye
[2]Department of Pediatric Nursing, Koç University Faculty of Nursing, İstanbul, Türkiye

Abstract

Delirium is a syndrome of acute-onset cerebral dysfunction characterized by impaired attention, awareness, and consciousness. Considering the adverse consequences for children, prevention and effective management of delirium are important. This systematic review aimed to determine the effectiveness of non-pharmacological methods for preventing delirium in pediatric intensive care units. This systematic review was designed and reported according to the PRISMA guidelines. Ten databases, including Cochrane, Cinahl, Clinical Key, EBSCO, PubMed, Science Direct, Wiley, Scopus, Web of Science, and Google Scholar, were searched using the keywords ("pediatric" or "child" or "children") and ("delirium" or "confusion" or "disorientation") and "intensive care unit" and "non-pharmacologic". The database search identified 2,390 studies. Five studies met the inclusion criteria and were included in the systematic review. The designs of the included studies were randomized controlled trials and quasi-experimental studies. The interventions evaluated to prevent delirium in children aged 0-21 included nursing bundle, massage therapy, reading books, and listening to music. The delirium levels of the children were assessed using the Cornell delirium assessment tool, the state-trait anxiety inventory for children, and the Sophia observation withdrawal symptoms-pediatric delirium scale. Nursing bundles and massage in pediatric intensive care units effectively prevent delirium.

Keywords: Child, delirium, intensive care unit, nursing, critical care

Öz

Deliryum, dikkat, farkındalık ve bilinç düzeyinde bozulma ile karakterize, akut başlangıçlı serebral işlev bozukluğu sendromudur. Çocuklar üzerindeki olumsuz sonuçları göz önünde bulundurulduğunda, deliryumun önlenmesi ve etkin yönetilmesi oldukça önemlidir. Bu sistematik derleme, pediyatri yoğun bakım ünitelerinde deliryumu önlemeye yönelik uygulanan non-farmakolojik yöntemlerin etkinliğini belirlemek amacıyla gerçekleştirilmiştir. Bu araştırma sistematik derleme niteliğindedir. Bu amaçla ("pediatric" or "child" or "children") and ("delirium" or "confusion" or "disorientation") and "intensive care unit" and "non-pharmacologic" anahtar kelimeleri kullanılarak Cochrane, Cinahl, Clinical Key, EBSCO, PubMed, Science Direct, Wiley, Scopus, Web of Science, Google Scholar olmak üzere 10 veri tabanı taranmıştır. Bu araştırmada veri tabanlarının taraması sonucunda toplam 2.390 yayına ulaşılmıştır. Araştırmaya dahil edilme kriterlerine uygun olan toplam 5 yayın araştırma kapsamına alınmış ve sonuçlar açısından değerlendirilmiştir. Dahil edilen çalışmaların tasarımları randomize kontrollü çalışmalar ve yarı deneysel çalışmalardı. Araştırma kapsamında deliryumu önlemek için 0-21 yaş arasında olan çocuklara bakım paketi, masaj uygulaması, kitap okuma ve müzik dinletme müdahaleleri yapılmıştır. Çocukların deliryum düzeyleri "Cornell deliryum değerlendirme arac", "çocuklar için durumluk sürekli kaygı envanteri" ve "Sophia yoksunluk ve pediatrik deliryum ölçeği" ile değerlendirilmiştir. Yoğun bakım ünitelerinde çocuklara uygulanan bakım paketinin ve masajın deliryumu önlemede etkili olduğu sonucuna ulaşılmıştır.

Anahtar Kelimeler: Çocuk, deliryum, yoğun bakım, hemşirelik, kritik bakım

Introduction

Delirium is a syndrome of acute-onset cerebral dysfunction characterized by impaired attention, awareness, and level of consciousness. It occurs as a result of a medical condition and often manifests as a severity that fluctuates throughout the day (1). The diagnostic and statistical manual of mental disorders defines delirium as "a disturbance in attention or consciousness that a pre-existing neurocognitive disorder cannot explain occurs for a medical reason, and shows acute and severe fluctuations with an additional disturbance

Corresponding Author:
İlçim Ercan Koyuncu, ilcimercan@hotmail.com

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in cognitive disorders such as memory, orientation, language, visuospatial competence or perception" (2). The pathophysiology of delirium is complex and not fully explained. However, it may develop due to changes in neurotransmitter function, decreased cerebral blood flow, increased energy metabolism, or cellular homeostasis disturbances (3,4).

The prevalence of delirium among hospitalized children varies between 10% and 60%. In critically ill children in the pediatric intensive care unit, this rate increases to 80% (4-7). Risk factors for delirium in childhood include age younger than 2 years, developmental delay, presence of comorbidities, respiratory failure, systemic inflammation, major surgery, hospital stay longer than 48 hours, benzodiazepine use, inability to control pain, physical fixation, sleep interruption, and immobility (8). Delirium in children leads to prolonged hospital stay, increased cost of care, and increased mortality and morbidity (9,10). In addition, post-traumatic stress disorder has been reported in one-third of children who develop delirium in intensive care units (11,12).

Considering the negative consequences of delirium, prevention and effective management are important. Preventing delirium in children is possible with a holistic and multidisciplinary approach focusing on eliminating the medical conditions that cause it. However, eliminating the causative medical conditions is not always possible or takes time. Therefore, non-pharmacological methods that minimize the risk of developing delirium are recommended to prevent delirium (13). These methods include supportive approaches, such as early mobilization, family-centered care practices, regulation of environmental factors, such as sound and light, and implementation of bundles (8). Studies have reported that these methods reduce delirium by supporting a healthy sleep-wake cycle and maintaining children's routines (14-16).

Nurses play a crucial role in managing pediatric delirium, particularly in intensive care units, where they are responsible for early detection, prevention, and therapeutic intervention. They continuously monitored children for subtle changes in behavior, cognition, and awareness using validated tools for the early detection of delirium. Preventive care includes strategies to maintain a regular sleep-wake cycle, reduce environmental stimuli, manage pain effectively, and involve family members in care. When delirium occurs, nurses administer and monitor medications and tailor non-pharmacological interventions to the child's needs. They communicate and educate families about their condition, work with a multidisciplinary team, advocate for the child's well-being, and provide emotional support to the child and the family. In addition, nurses provide ongoing monitoring and follow-up care to address any recurrent symptoms or long-term effects and contribute to the child's overall well-being during and after the delirium episode (1,3,4,13,17). Therefore, this systematic review aimed to determine the effectiveness of non-pharmacological methods for preventing delirium in pediatric intensive care units.

Material and Method

Study Questions

Study questions were determined according to the PICOS [P: (Participants) I: (Interventions) C: (Comparators) O: (Outcomes) S: (Study designs)] criteria.

P: Children being treated in the pediatric intensive care unit

I: Non-pharmacological interventions to prevent delirium

C: Comparison of the effects of interventions to prevent delirium

O: Decreased incidence of delirium

S: Randomized controlled trials and quasi-experimental designs.

Study questions;

- What non-pharmacological interventions can prevent delirium?

- Which non-pharmacological interventions are effective in preventing delirium?

Study Design

A retrospective literature review was conducted to identify non-pharmacological methods for preventing delirium in children treated in intensive care. The systematic review used the preferred reporting items for systematic reviews (PRISMA) standards. The literature search was conducted between April 1, 2023 and May 1, 2023 using the keywords ("pediatric" or "child" or "children") and ("delirium" or "confusion" or "disorientation") and "intensive care unit" and "non-pharmacologic".

Databases Used in the Study

The Cochrane, Cinahl, Clinical Key, EBSCO, PubMed, Science Direct, Wiley, Scopus, Web of Science, and Google Scholar databases were used.

Inclusion Criteria

The inclusion criteria for this study were non-pharmacological interventions to prevent delirium, a randomized controlled or quasi-experimental design, patients aged 25 years in intensive care units, published in English, and available full text.

Exclusion Criteria

The exclusion criteria of this study were not including non-pharmacological interventions, samples not consisting of children [aged 25 years and over (18)], no randomized controlled or quasi-experimental design, non-English language, and no available full text.

Study Selection

As a result of the search, a total of 2390 articles were reached. In total, 2000 articles were excluded because the title and abstract did not cover the keywords searched, and 20 articles were excluded because the publication language was not English. The number of articles decreased to 370. After excluding the same 85 articles repeated in different databases, the remaining 285 articles were evaluated according to title, abstract, and access to full text. We excluded 247 articles that did not include non-pharmacological intervention, 18 articles due to the use of different research designs [descriptive (n=65), cross-sectional (n=34), retrospective (n=19), methodological (n=16), and review (n=113)], and 15 articles due to inaccessibility of the full text. When evaluated by the inclusion and exclusion criteria, five articles suitable for the study were included and analyzed (Figure 1).

Results

The systematic review was conducted per the PRISMA standard, and 2,390 articles on the subject were identified based on the literature review. Data from five published articles were included in the review when limited according to the inclusion criteria (Table 1). All the studies were written in English. Three of the articles were quasi-experimental

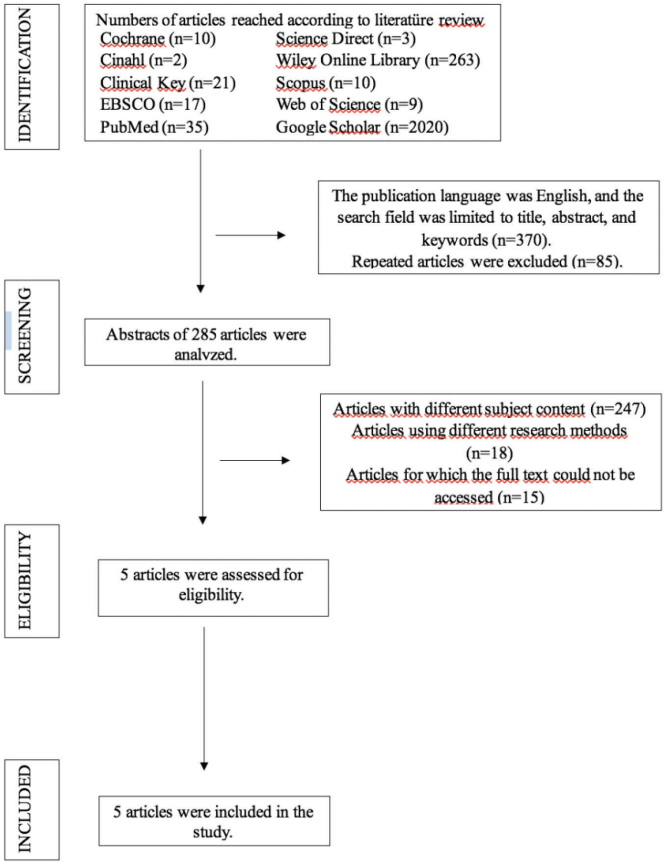

Figure 1.
PRISMA Literature Review Process Flow Diagram
PRISMA=preferred reporting items for systematic reviews

(15,19,20), and two were randomized controlled experimental (21,22) designs. Research was conducted in the United States (15,19,21), Canada (22), and the Netherlands (20).

Characteristics of the Sample Group

The study sample consisted of children being treated in intensive care units. In one study, children aged 18-21 in late adolescence were also included (15). In three studies, only children treated in the pediatric intensive care unit were included in the study (15,19,20), whereas in two studies, children treated in the pediatric cardiac surgery intensive care unit were also included (21,22). The sample size in each study evaluated within the scope of the study varies between 60 and 792. The total sample size obtained due to the systematic review was 1306.

Characteristics of the Analyzed Studies

Sixty percent (n=3) of the studies included in the systematic review were conducted in pediatric intensive care units, 20% (n=1) in cardiac surgery intensive care units, and 20% (n=1) across both pediatric and cardiac surgery intensive care units. Regarding study design, 40% (n=2) were randomized controlled trials that evaluated the effects of interventions such as massage, reading, music and headphone use on delirium and anxiety levels. The remaining 60% (n=3) were quasi-experimental studies that assessed the impact of nursing bundles on delirium. The continuous ambulatory peritoneal dialysis (CAPD) (60%, n=3) (23), state-trait anxiety inventory for children-state form (STAIC) (20%, n=1) (24), and Sophia observation withdrawal symptoms-pediatric delirium (SOS-PD) (20%, n=1) (25) groups were used to evaluate the effectiveness of the interventions. The measurement tools considered the parameters of the sample group that would affect delirium (15,19-22). CAPD was applied to children aged 0-21. The scale comprises eight items, each scored between 0 and 4. The Cronbach α value of the scale was 0.90. A score of 9 indicates a positive delirium assessment is positive (23). STAIC is applied to children aged 9-12. The scale, consisting of 20 items, measures the psychological effects of anxiety in children. This study aims to evaluate feelings related to state anxiety, such as tension, uneasiness, agitation, and nervousness. Cronbach α value is 0.81. The scale scores 20-60 points, with higher scores indicating greater anxiety (24). SOS-PD is applied to children aged 0-18. The scale comprises 17 items evaluated as "Yes" or "No". A score of 4 or higher on the delirium scale indicates positive delirium assessment is positive (25).

Most studies (15,19,20) used "nursing bundles" as a non-pharmacological intervention. After intensive care nurses were trained on nursing bundles, implementation was started. These bundles include ensuring day and night awareness, cognitive stimulation, presence of familiar person-object, ensuring orientation, supporting the use of devices such as glasses-headphones, creating rest periods during the day, reviewing the necessity of catheters, and keeping the noise level under control (15,19,20). In the studies by Simone et al. (15) and Michel et al. (20), early

Table 1.
Characteristics and Results of Studies Included in the Systematic Review

Author, year, country	Design	Purpose	Age group, sample	Method	Data collection tool	Result
Franken et al. (19) United States	A quasi-experimental design with a pre-test post-test control group in non-randomized groups	To evaluate the effect of an evidence-based non-pharmacological nursing bundle on delirium	Children aged 2-18 who were treated in the pediatric intensive care unit for >48 hours (n=266)	**Bundle implementation:** - Familiar person-object presence - Ensuring patient orientation - Ensuring day and night awareness - Protecting sound and light with the use of masks, headphones - Support the use of assistive devices (glasses, etc.) - Establishment of rest periods - The necessity of invasive catheters - Postponement of treatment and care at night	CAPD	The nursing bundle implementation did not affect the delirium score.
Michel et al. (20)	One-group pre-test post-test quasi-experimental design	To evaluate the effect of a nursing bundle consisting of non-pharmacological methods	Children aged 0-18 who were treated in the pediatric intensive care unit for >48 hours (n=792)	**Bundle implementation:** Part I (Care of sedated children) - Protecting sound and light with the use of masks, headphones Part II (Care of awake or intubated children) - Ensuring day and night awareness - Early mobilization - Cognitive stimulation - The presence of acquaintances - Ensuring patient orientation	SOS-PD	The delirium scores of patients who received the nursing bundle were low.
Simone et al. (15) United States	One-group pre-test post-test quasi-experimental design	To evaluate the effect of a nursing bundle consisting of non-pharmacological methods	Children aged 0-21 receiving mechanical ventilation support in the pediatric intensive care unit (n=144)	**Bundle implementation:** - Application of standard sedation protocol - Early mobilization	CAPD	The delirium scores of patients who received the nursing bundle were low.

Table 1. Continued

Author, year, country	Design	Purpose	Age group, sample	Method	Data collection tool	Result
Staveski et al. (21) United States	Randomized controlled experimental design	To evaluate the effect of massage and reading sessions within the first 24 hours after cardiac surgery on postoperative pain and anxiety levels and opioid and benzodiazepine exposure.	Children aged 6-18 who have undergone cardiac surgery in the intensive care unit (n=60)	**Massage practice:** - The procedure was implemented within 24 hours after the operation and continued as long as the patient remained in the hospital. - It was applied two or three times a week for a minimum of 15 minutes and a maximum of 30 minutes. - The massage protocol was developed in line with the requests and reactions specific to each patient. - Practitioners received "Massage Practitioner Certificate". - The practitioners selected a range of massage techniques to suit the patient's condition, preferences, and responses. - These techniques included classical massage, craniosacral therapy, myofascial release, energy-based modalities (e.g., Reiki and/or healing touch), acupressure, shiatsu, and neuromuscular therapy. - Massage was applied to the body's soft tissues with rhythmic hand movements. - The most frequently massaged areas included the extremities (legs and feet), head, face, neck, shoulders, and back. - The application was performed on the patient's bed in the supine position. Reading book: - The procedure was implemented within 24 hours after the operation and continued as long as the patient remained in the hospital. - The patients read the books for 30 minutes twice a week. - "The Lorax", "Horton Hears a Who!" and "Oh, the Places You will Go!" were selected as reading books.	STAIC	The anxiety scores and benzodiazepine exposure of children who received massage were significantly decreased. Therefore, we predicted that it would contribute to reducing delirium scores.

Table 1. Continued

Author, year, country	Design	Purpose	Age group, sample	Method	Data collection tool	Result
Garcia Guerra et al. (22) Canada	Randomized controlled experimental design	To evaluate the effect of music therapy on delirium in intensive care units	Children aged between 1 month and 16 years receiving mechanical ventilation support in the intensive care unit for >24 hours and hospitalized for 48 hours (n=60)	**Music practice:** - Classical music with 60 beats and a short tempo in the 45-55 dB sound range was played for 30 minutes thrice daily. - The music therapist selected the appropriate music. - The music selection process was meticulous, avoiding any disturbing chords or melodies that could evoke negative emotions. - The application was performed three times: once between 7:00 and 12:00, once between 12:00 and 16:00, and once between 16:00 and 20:00. Noise canceling headphones implementation: - This study aimed to reduce ambient noise by using noise-canceling headphones for 30 minutes three times a day. - A silent recording was played for half an hour using headphones. - The application was performed three times: once between 7:00 and 12:00, once between 12:00 and 16:00, and once between 16:00 and 20:00.	CAPD	The music and use of noise-canceling headphones did not affect the delirium scores.

CAPD=continuous ambulatory peritoneal dialysis, SOS-PD=Sophia observation withdrawal symptoms-pediatric delirium, STAIC=state-trait anxiety inventory for children-state form

mobilization with a standard sedation protocol was included in the nursing bundles.

Staveski et al. (21) used massage as a non-pharmacological intervention to determine its effect on delirium. Massage therapy was started within 24 hours after cardiac surgery and continued during the children's hospital stay. Massage was applied twice a week for a maximum of 30 minutes. The massage therapist selected a suitable massage technique for the patient. These techniques included classical massage, craniosacral therapy, myofascial release, energy-based modalities (e.g., Reiki and/or healing touch), acupressure, shiatsu, and neuromuscular therapy. Massage was applied to the body's soft tissues with rhythmic hand movements. The most frequently massaged areas included the extremities (legs and feet), head, face, neck, shoulders, and back. Masage was performed in the patient's bed in the supine position. Another non-pharmacological intervention used in the same study was book reading. Similar to the massage intervention, book reading sessions started within 24 hours after cardiac surgery and continued throughout the children's hospital stay. As a result of a literature review and collaboration with health professionals, "The Lorax", "Horton Hears a Who!" and "Oh, the Places You'll Go!" were selected as reading books. Patients read the book they preferred among the three books by themselves. The books were read twice a week for 30 minutes (21).

Garcia Guerra et al. (22) aimed to determine the effects of music listening and noise-canceling headphones on delirium in intensive care units. Short classical music pieces with a tempo of approximately 60 beats per minute, avoiding dramatic moments, disturbing chords, and discordant keys that may be associated with sadness, were played at a controlled volume of 45-55 dB, ensuring the safety of the patients' hearing. The music was selected by the music therapist. The group wearing noise-canceling headphones listened to a silent recording without any noise. The playlists of both groups began with a minute of silence to ensure blinding. The interventions were performed three times a day: In the morning, midday, and evening (22).

Discussion

Delirium, which is frequently observed in pediatric intensive care units, is a vital syndrome leading to prolonged hospital stay, increased cost of care, unplanned extubation,

and increased morbidity and mortality (6). To prevent the negative consequences of delirium, it is recommended to ensure a healthy sleep-wake cycle, regulate environmental factors, provide family-centered care, and use anxiety-reducing techniques such as music and massage (4). This systematic review examined non-pharmacological interventions to prevent pediatric delirium, aiming to guide healthcare professionals and transfer their knowledge to clinical practice. According to the results obtained from the five studies examined within the scope of the research, nursing bundles, listening to music, wearing headphones, reading books, and massage applications were used to prevent pediatric delirium in intensive care units. Despite the differences in the results of the studies, the potential of these non-pharmacological interventions, particularly when validated by future randomized controlled trials, is a source of inspiration for the future of pediatric care.

Effect of Nursing Bundles on Delirium

Multi-component delirium interventions, such as nursing bundles, are effective for adult and pediatric patients in various clinical areas because they directly target the elimination of delirium risk factors (26-28). The findings of this systematic review similarly show that nursing bundles are generally associated with reduced delirium scores. The outcomes of the nursing bundles differed despite the similarity of the sample group and inclusion criteria. Franken et al. (19), Michel et al. (20), and Simone et al. (15) applied a nursing bundle to determine its effect on delirium in pediatric intensive care units. Michel et al. (20) and Simone et al. (15) found that the delirium scores of children who received nursing bundles were lower, whereas Franken et al. (19) found that the nursing bundle did not affect delirium. In all three studies, nursing bundles were implemented after providing nursing training (15,19,20). However, in the studies of Michel et al. (20) and Simone et al. (15), delirium assessment tools were integrated into the nurse observation form, and the screening rate performed by nurses was reported to be >95%. Franken et al.'s (19) study reported that nurses forget to perform delirium screening. Therefore, the nursing bundle was considered ineffective because delirium monitoring was not sustainable (19). Intensive care nurses are ideal health professionals for assessing, preventing, and effectively managing delirium because they are constantly in contact with patients. Therefore, it is of great importance for clinicians to have knowledge and awareness about the importance of delirium screening and early intervention to reduce the negative consequences of delirium in children (29). Future studies should consider the practical training of nurses for the nursing bundles to treat pediatric delirium.

Michel et al. (20) and Simone et al. (15), the nursing bundle was implemented with a multidisciplinary approach. A standard protocol was established for sedated children, and early mobilization was included in the nursing bundle (15,20). These parameters were not included in the nursing bundle used by Franken et al. (19). Early mobilization in intensive care units reduces the duration of hospital stay and the need for mechanical ventilation, improves the sleep-wake cycle, and reduces the incidence of delirium (30). Similarly, the findings of these studies showed that nursing bundles, including early mobilization, were more effective. The duration of hospitalization and mechanical ventilation support was shortened, and delirium scores decreased (15,20). In the standard sedation protocol, morphine, fentanyl, and clonidine were used by limiting benzodiazepine exposure, which is the primary risk factor for pediatric delirium (6,7,31). Mody et al. (32) examined the relationship between benzodiazepine use and pediatric delirium and found that delirium was four times more common in children exposed to benzodiazepine, and daily increase in benzodiazepine dose increased the risk of delirium by 43%. The decrease in benzodiazepine exposure as a result of the application of the standard sedation protocol increased the effect of the nursing bundle by decreasing delirium scores.

Di Nardo et al. (33) evaluated the feasibility and safety of a nursing bundle in a pediatric intensive care unit and reported that children's need for sedation and analgesics decreased. The incidence of delirium after the application was found to be 23%, but no comparison could be made because delirium was not evaluated beforehand (33). Parallel to the results obtained from the studies reviewed in this systematic review (15,20), the nursing bundle, including a limited sedation protocol and early mobilization, was emphasized as feasible and safe (33).

Effects of Massage, Music, Headphones, and Reading on Delirium

In the study comparing massage and book reading methods, anxiety scores and benzodiazepine exposures of children who received massage decreased significantly. However, this was not observed in children who read boks (21). Therefore, we predicted that the application of a massage method would contribute to reducing children's delirium scores. Staveski et al. (13) reported that classical massage is the most commonly used technique. This massage was performed by certified practitioners two or three times a week for at least 15 and at most 30 minutes. Classical massage consists of effleurage, kneading, friction, tatman, and vibration techniques and is known for having the fewest side effects and high reliability (34). Similarly, Staveski et al. (21) found that classical massage had the best physiological stress responses and the lowest anxiety scores. In a study examining the effect of classical massage on delirium in patients who were followed up in the intensive care unit, the effect of massage on delirium could not be proven (35). Studies with a high level of evidence from a large sample group are needed to determine the effect of massage on delirium in pediatric populations and to establish best practices standards. Staveski et al. (21) found that the benzodiazepine exposure and anxiety scores of children who read books did not decrease. In another study, it was determined that reading animated books decreased children's anxiety scores (36). In both studies, the reading time was limited to 30 minutes and was continued until discharge from the hospital. However, in the study by Sekhavatpour et al. (36), the follow-up period

was short, and patients were followed up for an average of 2 days.

In a study comparing the methods of playing music and using noise canceling headphones were compared, it was determined that both methods had no effect on the delirium score (22). Classical music with a tempo of approximately 60 beats per minute, selected by the music therapist, was played three times a day at a range of 45-55 dB. Noise-canceling headphones were used, and a fake playlist containing silent recordings was created and played three times a day. Studies have shown that playing music and using headphones can prevent delirium by improving sleep quality among adult patients (37,38). However, it was emphasized that there was limited evidence to support the use of music or headphones in these studies and that randomized controlled trials are needed to determine whether music and headphones are effective in pediatric patients and, if effective, to determine good practice standards (22,37).

Study Limitations

The limitations of this study include the scarcity of RCTs on the topic and the absence of the research protocol in some RCTs included in the study.

Conclusion

As a result of the studies reviewed, the delirium scores of pediatric patients to whom nursing bundles, including early mobilization and standard sedation protocols, were low, and nurses should receive training before applying the nursing bundle. At the same time, while the application of massage had a positive effect on delirium, reading books, listening to music, and using noise-canceling headphones had no significant effect on delirium. Increasing the number of randomized controlled studies on pediatric delirium will help determine the best-practice standards of the methods used.

Footnotes

Author Contributions: Concept - İ.E.K., D.G.; Design - İ.E.K., D.G.; Analysis and/or Interpretation - İ.E.K., D.G.; Literature Review - İ.E.K.; Writing - İ.E.K., D.G.

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ORIGINAL ARTICLE

The Relationship Between Fear of COVID-19 and Family Harmony During the COVID-19 Pandemic in the Turkish Republic of Northern Cyprus: A Descriptive and Cross-sectional Study

Kuzey Kıbrıs Türk Cumhuriyeti'nde COVID-19 Salgını Sırasında COVID-19 Korkusu ve Aile Uyumu Arasındaki İlişki: Tanımlayıcı ve Kesitsel Bir Çalışma

Aslı Er Korucu[1], Yasemin Çekiç[2], Laden Serinsu Konuşur[3], Fatma Uslu Şahan[4]

[1]Department of Midwifery, Ankara University Faculty of Nursing, Ankara, Turkey
[2]Department of Nursing, Ankara University Faculty of Nursing, Ankara, Turkey
[3]Değirmenlik-Akıncılar Municipality Day Care Centre, Nicosia, North Cyprus, Turkey
[4]Department of Nursing, Hacettepe University Faculty of Nursing, Ankara, Turkey

Abstract

Objective: This study investigates the influence of coronavirus disease-2019 (COVID-19) related fear on family harmony among adults aged 18 and above in the Turkish Republic of Northern Cyprus.

Method: This descriptive and cross-sectional study included 720 participants selected through convenience and snowball sampling. An online survey method was employed to gather the data, and the survey was shared via social media from August 1 to September 1, 2020, due to the precautionary measures and restrictions in effect. The survey included a demographic information form with two scales: namely the fear of COVID-19 scale and the family harmony scale. Data analysis was conducted using SPSS version 23.0, employing descriptive statistics, t-tests, one-way ANOVA, and regression analysis.

Results: The participants' mean score on the fear of COVID-19 scale was 15.01±7.97. Increased levels of COVID-19 fear occurred in participants aged 45-65 (p=0.034), those who were unmarried (p=0.040), individuals who thought about self-harm during the pandemic (30), and those who received a COVID-19 diagnosis (p=0.013) or suffered the loss of a family member due to COVID-19 (p=0.002). The mean score on the family harmony scale was 20.42±4.87. Higher levels of family harmony were found among participants without thoughts of self-harm (p=0.01) and those who experienced a family loss due to COVID-19 (p=0.001). A moderate negative correlation was identified between the mean scores on the fear of COVID-19 scale and the family harmony scale (r=-0.460, p<0.001). Regression analysis revealed that fear of COVID-19 accounted for 21% of the variance in family harmony (Beta=-0.461, R^2=0.211, F=192.501).

Conclusion: The study emphasizes the significant correlation between COVID-19 fear and family harmony, illustrating that pandemic-related psychological stress adversely affects family dynamics. Healthcare practitioners and governments should devise measures to alleviate the negative impact of pandemic-induced dread on family dynamics and promote familial harmony.

Keywords: COVID-19 fear, family harmony, pandemic, Turkish Republic of Northern Cyprus

Öz

Amaç: Bu araştırma, Kuzey Kıbrıs Türk Cumhuriyeti'nde 18 yaş ve üzeri bireyler arasında koronavirüs hastalığı-2019 (COVID-19) korkusunun aile uyumu üzerindeki etkisini incelemektedir.

Yöntem: Bu tanımlayıcı ve kesitsel araştırmaya, kolayda ve kartopu örnekleme yöntemleri kullanılarak seçilen 720 katılımcı dahil edilmiştir. Veriler, uygulanan önleyici tedbirler ve kısıtlamalar nedeniyle 1 Ağustos-1 Eylül 2020 tarihleri arasında sosyal medya aracılığıyla dağıtılan bir anket aracılığıyla çevrimiçi olarak toplanmıştır. Ankette tanıtıcı özellikler formu, COVID-19 korkusu ölçeği ve aile uyumu ölçeği yer almıştır. Veri analizi, tanımlayıcı istatistikler, t-testleri, one-way ANOVA ve regresyon analizi kullanılarak SPSS 23.0 kullanılarak gerçekleştirilmiştir.

Bulgular: Katılımcıların COVID-19 korkusu ölçeğin ortalama puanı 15,01±7,97'dir. 45-65 yaş arası (p=0,034), bekar (p=0,040), pandemi sırasında kendine zarar verme düşüncesi olan (p=0,03) ve COVID-19 teşhisi konmuş (p=0,013) veya COVID-19 nedeniyle vefat etmiş bir aile üyesine sahip olan (p=0,002) katılımcıların COVID-19 korku düzeyi daha yüksektir. Katılımcıların aile uyumu ölçeği puan ortalaması 20,42±4,87'dir. Kendine zarar verme düşüncesi olmayan

Corresponding Author:
Aslı Er Korucu, akorucu@ankara.edu.tr

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(p=0,01) ve bir aile üyesini COVID-19 nedeniyle kaybeden (p=0,001) katılımcıların aile uyumu düzeyi daha yüksektir. COVID-19 korkusu ölçeği ve aile uyumu ölçeği ortalama puanları arasında orta düzeyde negatif bir korelasyon tespit edilmiştir (r=-0,460, p<0,001). Regresyon analizi, COVID-19 korkusunun aile uyumundaki varyansın %21'ini açıkladığını ortaya koymuştur (Beta=-0,461, R^2=0,211, F=192,501).

Sonuç: Araştırma, COVID-19 korkusu ile aile uyumu arasında önemli bir ilişki olduğunu vurgulamakta ve pandemiyle ilişkili psikolojik stresin aile dinamiklerini olumsuz etkilediğini göstermektedir. Sağlık hizmeti sağlayıcıları ve politika yapıcıların pandemiye bağlı korkunun aile dinamikleri üzerindeki olumsuz etkilerini hafifletmeye ve aile uyumunu artırmaya yönelik müdahaleler planlaması önerilmektedir.

Anahtar Kelimeler: COVID-19 korkusu, aile uyumu, pandemi, Kuzey Kıbrıs Türk Cumhuriyeti

Introduction

The coronavirus disease-2019 (COVID-19) outbreak has profoundly affected communities and individuals globally, disrupting daily life and adversely impacting mental health and social dynamics (1,2). The fear linked to COVID-19, including worries about the health and economic security of relatives, has resulted in the infection being a substantial psychological burden (3-5). The widespread fear of COVID-19 may result in heightened stress, anxiety, and depressive symptoms, consequently impacting daily living and interpersonal relationships (1,2,6). Understanding the extent and influence of COVID-19-related dread is essential since it impacts individuals and undermines familial relationships and cohesion (7-11).

The fear of COVID-19 is complex, involving worries about the safety and health of family members and anxiety over the pandemic's long-term socio-economic ramifications (3,10,12). These fears can significantly alter individuals' behaviors, leading to increased precautionary measures, social isolation, and even avoidance of essential activities (1,6,8). The psychological stress caused by these fears can manifest in various ways, impacting emotional well-being and daily functioning (6,13,14). Since families often provide the primary support system for many individuals during such crises, it is crucial to explore how these fears are experienced within the family unit (7,8,10,15).

Family harmony, characterized by the emotional bonds and sense of solidarity among family members (16), is crucial in mitigating the adverse effects of stressful events (16,17). During crises like the COVID-19 pandemic, strong family harmony can provide emotional support, enhance coping mechanisms, and foster a sense of stability and security (7). However, the prolonged nature of the pandemic and the associated fears challenge the maintenance of this harmony. A study conducted during the pandemic highlighted that family functioning is significantly related to intergenerational communication and satisfaction with social support. Families with balanced levels of cohesion and flexibility were better equipped to manage the psychological distress caused by the pandemic. These findings emphasize the importance of fostering balanced family dynamics to enhance resilience and well-being during crises. Furthermore, the study underscored the need for interventions aimed at improving family functioning and preventive measures to reduce psychological distress in future pandemics (18). Another study focusing on family dynamics during the COVID-19 pandemic revealed that family cohesion was negatively related to stress consequences. The study found that fear of COVID-19 partially mediated the relationship between family cohesion and stress consequences, indicating that cohesive families were better able to mitigate the adverse psychological impacts of pandemic-related fears (19). Disruptions in family harmony can lead to increased conflicts, communication breakdowns, and emotional distancing, exacerbating the stress experienced by family members (12,16). Understanding how the fear of COVID-19 affects family harmony is essential for developing effective psychosocial support strategies during such unprecedented times (7).

As a region with distinct cultural, social, and economic structures, Turkish Republic of Northern Cyprus (TRNC) provides a unique context for examining how these factors influence the interplay between pandemic-induced fear and family cohesion. While global studies have explored the psychological effects of COVID-19, few have directly assessed its impact on family cohesion, particularly in such socio-culturally specific settings. To the best of our knowledge, these dynamics have not yet been explored within the context of the TRNC. This research aims to address this gap by investigating the relationship between COVID-19 fear and family harmony among adults, offering valuable insights into how families in this unique socio-cultural environment adapt to pandemic-related stress.

The socio-cultural context of TRNC provides a unique setting for examining these dynamics. Despite the global nature of the pandemic, regional differences in cultural, social, and economic structures can influence how fear and family harmony are experienced and managed. This study is important not only in the context of the COVID-19 pandemic but also for understanding family resilience during future health crises and global challenges. The pandemic has highlighted the vulnerabilities in family dynamics under conditions of constant stress, fear, and uncertainty. As global health experts anticipate future pandemics or similar crises, examining the relationship between fear-induced psychological stress and family cohesion is essential for building resilient support systems. This research examines

Main Points

- Participants exhibited a moderate fear of coronavirus disease-2019 (COVID-19), but their levels of family harmony were assessed as high.
- A negative correlation exists between fear of COVID-19 and family harmony, with fear of COVID-19 accounting for 21% of the variance in family harmony.
- Healthcare practitioners and governments must design ways to bolster the resilience and welfare of families during public health emergencies.

the influence of COVID-19-related fear on family harmony among adults aged 18 and above in the TRNC. The research inquiries are as follows: (i) What is the level of fear of COVID-19 among individuals aged 18 and older in the TRNC? (ii) What is the level of family harmony among individuals aged 18 and above in the TRNC? (iii) Is there a correlation between the fear of COVID-19 and family harmony among individuals aged 18 and above in the TRNC? (iv) Does the fear of COVID-19 impact family harmony among individuals aged 18 and above in the TRNC?

Material and Method

Study Design And Participants

This research is a descriptive and cross-sectional study. The research population comprises individuals living in the TRNC during the COVID-19 pandemic. The sample of this research was obtained by using non-random sampling techniques, namely convenience and snowball sampling, resulting in 751 individuals being included. These methods were deemed appropriate given the unique challenges posed by the COVID-19 pandemic, particularly the strict social distancing measures and restrictions on face-to-face interactions during the data collection period. Participants were recruited using announcements disseminated via social media and other platforms, including email, WhatsApp, Instagram, and Facebook, employing a snowball sampling method. The inclusion criteria required participants to be at least 18 years old, having a family, and being healthy individuals without any obstacles to communication. For this study, "healthy individuals" were defined as those without a diagnosed psychiatric illness, as such a condition could influence communication abilities or the study variables. The exclusion criteria included reluctance to participate or an inability to provide informed consent. Efforts were made to ensure that the recruited sample represented the target population while acknowledging the potential limitations of online recruitment methods during the pandemic. This approach aimed to maintain consistency and validity in data collection while addressing ethical considerations.

Twenty people were omitted for being underaged, 11 were excluded for declining participation, yielding a final sample of 720 participants. Following data collection, a post-hoc power analysis was conducted using the G*Power 3.1.9.7 software to assess the adequacy of the sample size. The analysis was based on the effect size obtained from the regression analysis of the collected data, which revealed an effect size of 0.07, an alpha value of 0.05, and a power of 1.00. This indicates that the sample size was sufficient to detect significant relationships between the variables under investigation.

The study's data were gathered from August 1 to September 1, 2020, utilizing an online survey, in response to preventive measures and restrictions in the TRNC. The scales were developed using Google Forms, and an online survey link was disseminated to all participants using email, WhatsApp, Facebook, or Instagram. Participants were instructed to share the survey link with acquaintances, using snowball sampling. Before participation, all persons were apprised of the study's objectives and methodologies, and consent was secured online and in writing from those who consented to participate. The survey required roughly 20 minutes to complete.

Data Collection Tools

Data were gathered online via a demographic information form, the fear of COVID-19 scale, and the family harmony scale.

Demographic Information Form: The form, which was developed by the researchers through a literature study, comprises 13 questions aimed at identifying participants' demographic parameters, including age, gender, marital status, and cohabitants.

The Fear of COVID-19 Scale: The scale was developed by Ahorsu et al. (3) and translated into Turkish by Satici et al. (20). It assesses "individuals" fear levels associated with COVID-19. The Likert scale contains seven items with no sub-dimensions and five points each (3). Therefore, the score on the scale varies between 5 and 35, where higher scores represent more significant levels of fear (20). Cronbach's alpha value obtained in this study was 0.89, slightly higher than the original scale, which was determined to be 0.84 (20).

Family Harmony Scale: The scale, which measures individuals' degrees of family harmony, was first introduced by Kavikondala et al. (16) and revised for Turkish by Kula et al. (21). The Likert scale consists of five items with no sub-dimensions, and each item scores five points. The scale's minimum score is 5, while the maximum is 25, with elevated scores signifying enhanced family harmony. Cronbach's alpha value computed in this study was 0.85, slightly lower than the original scale, with the original scale at 0.92.

Statistical Analysis

Data were analyzed at a significance level of 0.05 utilizing Statistical Package for the Social Sciences® 23.0 for Windows® (IBM Corporation, Armonk, NY, USA). Numerical values and percentages were used for descriptive analysis. The Kolmogorov-Smirnov test was employed to assess normality. Independent sample t-tests and one-way ANOVA were employed to evaluate group differences based on demographic factors. The Tukey test was employed for pairwise comparisons to identify the source of discrepancies. The association of the scales was examined through correlation and simple regression analyses. The level of internal consistency was evaluated using the computed Cronbach's alpha coefficient.

Ethical Considerations

The study was conducted in accordance with the principles of the Helsinki Declaration. The research protocols were approved by the Ankara University Ethics Committee and

ethical approval was obtained for the conduct of the study (decision no: 13/182, date: 09.07.2020). Through voluntary participation, an online informed consent form was secured from all participants.

Results

In the study, 36.5% of the participants were in the 26-35 age range, 64.7% were female, and 53.8% were married. Additionally, 57.2% lived with their spouse/partner and/or children. During the pandemic, 93.6% of the participants did not experience thoughts of self-harm. Furthermore, 61.1% reported living with individuals who have chronic illnesses. Regarding COVID-19 diagnoses, 40% stated that none of their close contacts had been diagnosed with COVID-19. Regarding COVID-19-related deaths, 64.6% of participants reported that there had been no such losses among their acquaintances (Table 1).

The participants' mean score on the fear of COVID-19 scale was 15.01±7.97 (Table 2). Higher mean scores on the fear of COVID-19 scale were observed among participants aged 45-65 (p=0.034), those who were single (p=0.040), those who experienced thoughts of self-harm during the pandemic (p=0.030), those with at least one family member/relative diagnosed with COVID-19 (p=0.013), and those who experienced the loss of a family member/relative due to COVID-19 (p=0.002) (Table 3).

Table 1.
Descriptive Characteristics of the Participants (n=720)

Descriptive characteristics	n	%
Age		
18-25	192	26.7
26-35	263	36.5
36-45	154	21.4
45-65	111	15.4
Gender		
Female	466	64.7
Male	254	35.3
Marital status		
Married	387	53.8
Single	333	46.2
People with whom the participants live		
Alone	89	12.4
Spouse/partner and/or children	412	57.2
Parents and/or siblings	219	30.4
Thoughts of self-harm during the pandemic		
Yes	46	6.4
No	674	93.6
Presence of individuals with chronic illness in the living environment		
Yes	440	61.1
No	280	38.9
Receiving a diagnosis of COVID-19		
Himself/herself	62	8.6
At least one person from family/relatives	78	10.8
At least one person from friends	119	16.15
At least one person from neighbors	183	25.4
At least one person from colleagues	165	22.9
No one	288	40.0
Death due to COVID-19		
At least one person from family/relatives	62	8.6
At least one person from friends	69	9.6
At least one person from neighbors	70	9.7
At least one person from colleagues	52	7.2
No one	465	64.6

COVID-19=coronavirus disease

Table 2.
Participants' Mean Scores on the Fear of COVID-19 Scale and the Family Harmony Scale (n=720)

Scales	Mean	SD	Minimum and maximum scores to be obtained from the scales
Fear of COVID-19 scale	15.01	7.97	7-35
Family harmony scale	20.42	4.87	5-25

COVID-19=coronavirus disease; SD=standard deviation

The participants' mean score on the family harmony scale was 20.42±4.87 (Table 2). Participants who did not experience thoughts of self-harm during the pandemic (p=0.01) and individuals who experienced the loss of a family member/relative due to COVID-19 (p=0.001) exhibited higher mean scores on the family harmony scale (Table 3).

A moderate negative correlation was identified between the mean scores on the fear of COVID-19 scale and the family harmony scale (r=-0.460, p<0.001) (Table 4). The impact of participants' fear of COVID-19, on family harmony was examined using a simple regression model, as illustrated in Table 4. The model results indicated Beta=-0.461, R^2=0.211, and F=192.501. The participants' fear of COVID-19 constituted 21% of the overall impact on family harmony. A one-unit rise in COVID-19 fear results in a 0.461-unit decrease in family harmony.

Table 3.
Mean Scores on the Fear of COVID-19 Scale and the Family Harmony Scale by Descriptive Characteristics (n=720)

Descriptive characteristics	Fear of COVID-19 scale			Family harmony scale		
	Mean ± SD	Test	p	Mean ± SD	Test	p
Age						
18-25	15.14±7.58	F=2.895	0.034	20.08±4.81	F=2.078	0.102
26-35	14.22±7.71[a]			20.75±4.54		
36-45	14.88±8.33			20.88±4.77		
45-65	16.86±8.53[b]			19.66±5.77		
Gender						
Female	15.41±7.80	t=1.830	0.68	20.74±4.41	t=2.325	0.20
Male	14.28±8.39			19.86±5.61		
Marital status						
Married	14.44±7.72	t=-2.060	0.040	20.70±4.76	t=1.625	0.105
Single	15.67±8.22			20.11±5.01		
People with whom the participants live						
Alone	16.24±9.12	F=1.898	0.69	20.30±5.48	F=2.679	0.051
Spouse/partner and/or children	14.57±7.77			20.77±4.70		
Parents and/or siblings	15.35±7.82			19.84±4.92		
Thoughts of self-harm during the pandemic						
Yes	17.43±8.72	t=2.136	0.03	18.63±4.95	t=-2.595	0.01
No	14.85±7.90			20.55±4.85		
Presence of individuals with chronic illness in the living environment						
Yes	15.54±8.49	t=2.222	0.27	20.37±5.12	t=-0.420	0.674
No	14.19±7.01			20.53±4.48		
Receiving a diagnosis of COVID-19						
Himself/herself						
Yes	16.56±9.39	t=1.606	0.109	20.40±5.19	t=-0.044	0.965
No	14.86±7.82			20.43±4.85		
At least one person from family/relatives						
Yes	17.12±9.94	t=2.477	0.013	20.90±4.80	t=0.898	0.370
No	14.76±7.67			20.37±4.89		
At least one person from friends						
Yes	15.52±9.31	t=0.763	0.446	20.51±4.45	t=0.760	0.058
No	14.91±7.69			20.21±4.93		
At least one person from neighbors						
Yes	15.83±9.16	t=1.601	0.110	20.36±5.17	t=-0.237	0.812
No	14.73±7.52			20.45±4.78		
At least one person from colleagues						
Yes	15.57±8.88	t=1.025	0.306	19.75±5.67	t=-2.055	0.55
No	14.85±7.68			20.63±4.60		
No one						
Yes	15.41±7.70	t=1.105	0.270	20.88±4.71	t=-3.052	0.052
No	14.74±8.15			20.75±5.06		

Table 3.
Continued

Descriptive characteristics	Fear of COVID-19 scale			Family harmony scale		
	Mean ± SD	Test	p	Mean ± SD	Test	p
Death due to COVID-19						
At least one person from family/relatives						
Yes	17.98±9.99	t=3.089	0.002	20.61±4.64	t=-3.307	0.001
No	14.73±7.71			18.48±6.68		
At least one person from friends						
Yes	16.74±11.33	t=1.897	0.58	21.16±5.65	t=1.308	0.091
No	14.83±7.52			20.35±4.79		
At least one person from neighbors						
Yes	16.30±10.23	t=1.424	0.155	21.27±4.97	t=1.522	0.129
No	14.87±7.69			20.34±4.86		
At least one person from colleagues						
Yes	15.58±10.39	t=0.531	0.596	19.31±6.84	t=-1.723	0.085
No	14.97±7.76			20.52±4.69		
No one						
Yes	15.14±7.53	t=0.565	0.572	20.294.77±	t=-1.015	0.310
No	14.78±8.74			20.68±5.06		

[a, b]=in the same column, groups designated with different letters for each variable are statistically significant, Tukey test, F=one-way ANOVA, t=independent-samples t-test, COVID-19=coronavirus disease-2019, SD=standard deviation

Table 4.
The Impact of COVID-19 Fear on Participants' Family Harmony

Model	Unstandardized coefficients		Standardized coefficients	t	R^2	r	F
	B	Std. Error	Beta				
Family harmony							
(Constant)	24.652	0.345	-0.461	71.540*	0.211	-0.460	192.501*
Fear of COVID-19 scale	-0.281	0.020		-13.874*			

F=one-way ANOVA, t=independent-samples t-test, COVID-19=coronavirus disease-2019

Discussion

The findings from this study offer significant insights into the intricate relationship between COVID-19 fear and familial harmony among adults aged 18 and above in the TRNC. Participants exhibited a moderate fear of COVID-19, whereas their levels of familial harmony were elevated. The research discovered that various demographic factors affected participants' anxiety about COVID-19 and familial cohesion. More notably, a remarkable relationship was observed between fear of COVID-19 and family harmony. These findings highlight the effect of pandemic-related fear on family dynamics, emphasizing the resilience and strength of family bonds during challenging times.

The study findings indicate that participants reported a moderate level of fear of COVID-19. Notably, higher levels of fear were encountered among specific demographic groups, including individuals aged 45-65, single participants, those who experienced thoughts of self-harm during the pandemic, and those who had a family member diagnosed with COVID-19 or had a family member who died due to the virus. These results align with the existing literature suggesting that fear and anxiety during the pandemic are influenced by a combination of factors including age, marital status, mental health history, and personal experiences related to the virus (1,4, 22,23). Brooks et al. (24) reported that older adults, especially individuals aged 45 to 65, are more prone to heightened fear and anxiety because of their increased vulnerability to severe outcomes if infected. Quadros et al. (4) suggested that single individuals may lack immediate emotional support from a partner, which can exacerbate feelings of fear and isolation. The increased fear among those with thoughts of self-harm aligns with

the literature highlighting that pre-existing mental health issues may intensify during the pandemic due to the stress and uncertainty of the situation (24,25). Additionally, this research indicates that individuals with direct personal experiences related to COVID-19, such as having a family member diagnosed with or who died from the virus, report higher levels of fear. This personal connection to the pandemic can heighten perceived threat and vulnerability, contributing to increased anxiety (4,14,26). This study contributes to the existing evidence by demonstrating how these factors interact to influence the levels of fear associated with COVID-19. Comprehending these levels of fear can inform the creation of targeted interventions to enhance mental well-being amid current and future public health emergencies.

The study indicated that participants exhibited elevated levels of family harmony, especially among individuals who did not contemplate self-harm during the pandemic and those who experienced the loss of a family member due to COVID-19. The finding corroborates the current research emphasizing the essential function of familial support and cohesion during crises (7,8,16,27). Research indicates that strong family bonds are crucial in mitigating the adverse psychological effects of pandemics, providing emotional stability, and fostering resilience (7,16). Patterson (28) noted that families who maintain open communication, mutual support, and adaptable coping strategies tend to exhibit higher levels of harmony and collective resilience. The increased family harmony among participants without thoughts of self-harm suggests that mental stability enhances family relationships. Individuals with good mental health are more likely to form positive relationships with family members, contributing to a supportive and cohesive family environment (8,27). The finding that some individuals who have lost a family member to COVID-19 reported higher levels of family harmony may reflect the unifying effect of shared grief. Families often come together in the face of loss, drawing strength from collective mourning and mutual support, which can reinforce family bonds (8,29). These results underscore the role of family support systems in promoting resilience and emotional well-being during public health crises.

The study's findings reveal a substantial correlation between fear of COVID-19 and family harmony, with the fear of COVID-19 explaining 21% of the variance in family harmony. This corresponds with current research indicating that psychological stress related to the pandemic might adversely affect family relations (2,7,17). Increased anxiety and fear can lead to heightened intra-family tensions and conflicts, thereby reducing overall family harmony (7,12,17). Pandemic-induced stress presents unprecedented challenges for families, such as health concerns, financial instability, and changes in daily routines (8,12,24,30). This stress can exacerbate pre-existing family issues and generate new points of conflict (7,8,12,30). Furthermore, during a pandemic, fear and anxiety can disrupt typical family roles and responsibilities (17,31). Brown et al. (31) highlight that parents face increased pressure to manage both work and child care, which can lead to excessive role strain and stress that may permeate family interactions. This role strain can diminish parents' emotional availability and responsiveness, which are critical factors for maintaining family harmony (7). Furthermore, fear of contagion and illness can lead to social isolation even within the household, as family members may distance themselves to protect vulnerable individuals (7,8,24). This physical and emotional distance can weaken family bonds and reduce opportunities for supportive interactions, further undermining family harmony (24). Understanding the interaction between pandemic-related stresses and their impact on family dynamics is essential for formulating effective interventions and support structures that strengthen family resilience during challenging periods.

Study Limitations

This study has some limitations that must be acknowledged when assessing the results. The cross-sectional approach of the study restricts the capacity to determine causal correlations between fear of COVID-19 and family harmony. Longitudinal studies are crucial for establishing causality and monitoring temporal variations. Secondly, the data were acquired by self-report instruments, which may be prone to social desirability bias and recall errors. The sample is restricted to adults aged 18 and above in the TRNC, thereby constraining the generalizability of the findings to other age groups and regions. Furthermore, the use of social media as a primary tool for participant recruitment may have skewed the sample toward individuals who are more active online, potentially underrepresenting groups with limited internet access or digital literacy.

Conclusion

This study highlights the significant relationship between COVID-19-related fear and family harmony among individuals aged 18 and above in the TRNC. The findings reveal that participants experienced moderate levels of fear of COVID-19, which negatively influenced family harmony. Despite the stress associated with the pandemic, familial harmony levels remained relatively high, particularly among participants who did not experience thoughts of self-harm and who endured the loss of a family member due to COVID-19. Given the significant influence of pandemic-related fear on family harmony, the results emphasize the need for targeted interventions. Public health initiatives should prioritize at-risk populations, such as single individuals and those directly affected by pandemics, by implementing family support programs and accessible mental health services.

These efforts should address the unique psychological and social challenges posed by widespread health crises, ensuring support systems are resilient and adaptable to future pandemics. Additionally, public health messaging should actively promote mental health resources, reduce stigma around seeking psychological support, and encourage community engagement to mitigate the adverse effects of isolation.

By implementing these strategies, healthcare providers and policymakers can better address the psychological and social challenges posed by pandemics. Strengthening family resilience through comprehensive interventions not only promotes mental well-being but also ensures the stability of family bonds during current and future global health crises. This study contributes valuable insights into the psychological and social impact of pandemics, emphasizing the need for proactive and inclusive public health strategies.

Ethics Committee Approval: The research protocols were approved by the Ankara University Ethics Committee and ethical approval was obtained for the conduct of the study (decision no: 13/182, date: 09.07.2020).

Informed Consent: Through voluntary participation, an online informed consent form was secured from all participants.

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Footnotes

Author Contributions: Concept – A.E.K., Y.Ç., L.S.K., F.U.S.; Design – A.E.K., Y.Ç., L.S.K., F.U.S.; Data Collection and/or Processing – A.E.K., Y.Ç., L.S.K., F.U.S.; Analysis and/or Interpretation – A.E.K., F.U.S.; Literature Review – A.E.K., Y.Ç., L.S.K., F.U.S.; Writing – A.E.K., Y.Ç., L.S.K., F.U.S.

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ORIGINAL ARTICLE

The Relationship Between Empathic Tendency and Happiness Levels in Associate Degree Students Studying in the Health Field: A Descriptive and Cross-sectional Study

Sağlık Alanında Okuyan Önlisans Öğrencilerinde Empatik Eğilim ve Mutluluk Düzeyleri Arasındaki İlişki: Tanımlayıcı Kesitsel Çalışma

Sibel Çaynak

Department of Nursing, Antalya Bilim University Faculty of Health Sciences, Antalya, Turkey

Abstract

Objective: The research was planned to determine the relationship between empathic tendency and happiness level in associate degree students studying in the field of health.

Method: The study is of descriptive cross-sectional type. The research was conducted at a university with 280 students who agreed to participate. Data were collected using the empathic behavior scale and the happiness level scale. The analysis of the data was performed using the SPSS 25.0 program, t-test, Mann-Whitney U test, one-way ANOVA, Kruskal-Wallis test, and correlation analysis for the relationship between variables.

Results: The mean age of the participants was 21.11 (±3.86) and 83.9% of them were women. The empathy scale mean score is 54.67, and the average happiness level score is 22.92. Women's empathy tendencies were found to be higher. It was determined that the happiness scale scores of the participants showed a statistically significant difference according to their income level and place of residence ($p<0.05$). A statistically significant and positive relationship ($r=0.169$, $p<0.01$) was found between empathy and happiness level.

Conclusion: Empathy tendencies and happiness levels of health professionals have an important place in the delivery of quality and efficient health services. It is important for managers to regularly monitor the data on empathy tendencies and happiness levels of health professionals to provide a good working environment, offer opportunities that allow them to develop themselves, and provide necessary support. It is recommended to support participation in events such as in-service trainings, congresses, and symposia.

Keywords: Associate degree students, empathy, happiness

Öz

Amaç: Araştırma, sağlık alanında öğrenim gören ön lisans öğrencilerinde empatik eğilim ile mutluluk düzeyi arasındaki ilişkiyi belirlemek amacıyla planlanmıştır.

Yöntem: Araştırma tanımlayıcı kesitsel tiptedir. Araştırma bir üniversitede araştırmaya katılmayı kabul eden 280 öğrenci ile yürütülmüştür. Empatik davranış ölçeği ve mutluluk düzeyi ölçeği kullanılarak veriler toplanmıştır. Verilerin analizi SPSS 25.0 programında yapılmış olup, t-testi, Mann-Whitney U testi, one-way ANOVA, Kruskal-Wallis testi, değişkenler arasındaki ilişki için korelasyon analizi yapılmıştır.

Bulgular: Katılımcıların yaş ortalaması 21,11 (±3,86) ve %83,9'u kadındır. Empati ölçeği ortalama puanı 54,67, mutluluk düzeyi ortalama puanı 22,92'dir. Kadınların empati eğilimleri daha yüksek bulunmuştur. Katılımcıların gelir düzeyine ve yaşadıkları yere göre mutluluk ölçeği puanlarının istatistiksel olarak anlamlı bir farklılık gösterdiği tespit edilmiştir ($p<0,05$). Empati ile mutluluk düzeyi arasında istatistiksel olarak anlamlı ve pozitif yönlü ($r=0,169$, $p<0,01$) bir ilişki tespit edilmiştir.

Sonuç: Kaliteli ve verimli sağlık hizmeti sunumunda sağlık profesyonellerinin empati eğilimleri ve mutluluk düzeyleri önemli bir yere sahiptir. Sağlık profesyonellerinin empati eğilimleri, mutluluk düzeyleriyle ilgili verilerin yöneticileri tarafından düzenli izlenmesi, iyi bir çalışma ortamı sağlanması, kendilerini geliştirmelerine imkan tanıyacak fırsatların sunulması ve gerekli desteğin verilmesi önemlidir. Hizmet içi eğitimler, kongre, sempozyum gibi bilimsel toplantılara, sosyal ve kültürel etkinliklere katılımının desteklenmesi önerilmektedir.

Anahtar Kelimeler: Önlisans öğrencileri, empati, mutluluk

Corresponding Author:
Sibel Çaynak, sibeltimur86@hotmail.com

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Introduction

The healthcare sector is a constantly evolving field. Providing healthcare services requires establishing healthy communication with others. By nature, people are motivated to communicate. Approaching others with empathy during communication enhances mutual understanding. Empathy is defined as the ability to understand another person's feelings and thoughts and to experience compatible emotions. The fundamental aspect of empathy is understanding patients' experiences. Empathy facilitates communication in every aspect of life. It is stated that empathy positively impacts emotional well-being and helps individuals maintain positive relationships (1,2). A lack of empathy indicates a lower understanding of the patient's perspective, whereas a high level of empathy reflects a better understanding and meeting of patient needs through interpersonal relationships (3). Patients approached with empathy experience reduced anxiety and increased satisfaction (4). When healthcare professionals use empathy skills while communicating with patients and their relatives, it prevents miscommunication and enhances the quality of interaction. Patients who feel understood are more satisfied, which, in turn, leads to increased job satisfaction and professional fulfillment for healthcare workers.

Happiness is defined as the frequent experience of positive emotions and high life satisfaction, and it is associated with both physical and mental health (5). Individuals with high levels of empathetic behavior in interpersonal relationships and work environments tend to have a happier lifestyle. There is a relationship between happiness and a positive outlook on life. Studies show that greater happiness contributes to better health and life satisfaction (6). It is stated that individuals with higher levels of happiness also have higher psychological well-being (7). Happiness provides individuals with a healthier mind and enhances their ability to cope with life events.

Research focusing on the positive aspects of individuals' well-being, such as life satisfaction, hope levels, optimism, and happiness, as well as their positive emotions, has been steadily increasing (8). For example, there are studies that examine the impact of happiness on individuals' psychological resilience (9-11). Happiness and empathy are key concepts in positive psychology. Disciplines dedicated to understanding humans and society emphasize that achieving happiness is a critical goal, and highlight the importance of studies in this area (10). Empathy is essential in optimal healthcare delivery; however, no study has been found that examines empathy levels across different healthcare disciplines. Based on this, determining the empathic tendency and happiness level of students studying at the associate degree level in the field of health is important, as it will affect the quality of service delivery while practicing their profession. Therefore, the aim of this study is to assess the relationship between empathetic tendencies and happiness levels among associate degree students studying in the health field.

Main Points

- Empathy is important in the provision of health services because it supports the development of individuals' awareness, communication and emotional skills.
- Individuals with high levels of empathy can lead a more satisfying and fulfilling lifestyle both in interpersonal relationships and in work environments.
- It is of great importance for health professionals who provide health services to develop their empathy skills.

Material and Method

Study Design

This study is descriptive and cross-sectional.

Research Questions

1. What is the level of empathic tendency in associate degree students studying in the health field?

2. What is the level of happiness in associate degree students studying in the health field?

3. Is there a relationship between empathic tendency and happiness level in associate degree students studying in the health field?

Population and Sample

The population of the study consisted of students enrolled in the Health Services Vocational School at Antalya Bilim University. There are nine different programs in the health vocational school. These are physiotherapy, first and emergency aid, opticianry, dialysis, anesthesia, medical laboratory, oral and dental health, operating room, medical imaging (n=900). The sample size was calculated using the known population formula, with a 95% confidence level and a 5% margin of error, yielding a required sample size of 269. The sample of the study consisted of 280 associate degree students who agreed to participate.

Inclusion Criteria

- Proficiency in the Turkish language,
- Being a student at the health services vocational school in the institution where the research was conducted,
- Voluntary participation in the study.

Data Collection Tools

Personal Information Form: This form consists of nine questions designed to gather participants' sociodemographic data. The personal information form consists of questions aimed at determining age, gender, place of residence, financial situation, department, and class of study.

Toronto Empathy Scale (TES): The TES, developed in 2009 by Spreng et al. (12), is a 16-item, 5-point Likert scale. In Turkey, the scale was adapted by Totan et al. (13) in 2012, reducing the number of items to 13 due to cultural differences . The internal consistency reliability coefficient of the scale was found to be 0.79, and the test-retest reliability coefficient after two weeks was 0.73. The TES is a unidimensional core measurement tool designed to minimize differences between the subdimensions of empathy. Items 1, 3, 5, 7, 8, 9, 11, and 12 are reverse-coded. Higher scores indicate greater empathy. As a result of the analysis conducted for the reliability of the scale, the Cronbach alpha internal consistency coefficient was found to be 0.79 (13). In this study, the Cronbach's alpha internal consistency coefficient was calculated as 0.79.

Oxford Happiness Questionnaire (OHQ): The OHQ-short form was validated and tested for reliability in 2011 by Doğan and Doğan and Akıncı Çötok (14). Originally an 8-item scale, the scale was reduced to a 7-item, 5-point Likert scale after items with a total correlation below 0.30 were removed. The internal consistency and test-retest reliability coefficients of the scale were 0.74 and 0.85, respectively. Items 1 and 7 are reverse-coded. Higher scores on the scale indicate greater happiness. The scale's reliability is reported as Cronbach's alpha =0.692, indicating moderate internal consistency (14). In this study, the Cronbach alpha internal consistency coefficient was calculated as 0.78.

Ethical Considerations

Ethical approval for the study was obtained from Akdeniz University Faculty of Medicine Clinical Research Ethics Committee and institutional permission was granted from the institution where the study was conducted. (decision no: KAEK-42, date: 11.01.2023). Voluntary consent forms were collected from participants. Additionally, written informed consent was obtained from all participants in accordance with the principles of the Helsinki Declaration.

Procedure

Voluntary consent forms were collected from participants who agreed to participate. The study was carried out with 280 students enrolled in the Health Services Vocational School at Antalya Bilim University during the Spring Semester of the 2022-2023 academic year. Data was collected online using Google Forms during the data collection period, due to the transition to online education following the earthquake in the country. The students' e-mail groups were obtained from the student affairs office. The form was shared in the students' e-mail group. The first page of the form includes information about the research and the approval section. Those who completed the approval form accessed the scale items and responded to them.

Statistical Analysis

The data were analyzed using Statistical Package for Social Sciences version 25.0. Descriptive statistics such as frequencies, percentages, means, and standard deviations were used. Both parametric and nonparametric tests were applied to analyze the variables. To test whether scores from two independent samples differed significantly, independent samples t-test and Mann-Whitney U test were used. To test whether the mean scores of more than two independent samples differed significantly, one-way ANOVA (F-test) and the Kruskal-Wallis test were applied. Correlation analysis was conducted to examine the relationships between variables. Regression analysis was performed to evaluate the impact of independent variables on dependent variables.

Results

The average age of the participants was found to be 21.11. The participants are 83.9% female and 96.1% single. It was found that 19.6% of the participants were in the operating room services, 12.1% in dialysis, and 11.8% in the department of anesthesia. It was determined that 58.6% of the participants were in the second class and 41.4% were in the first class. It was determined that 76.1% of the participants had health insurance, 55.0% had equal levels of income and expenses, and 65.0% lived in the province. 87.9% of the participants had a mother, father, or sibling they were living with (Table 1).

The means of the scales in the study were found to be 54.67 for empathy tendency and 22.92 for happiness level. It was observed that the skewness and kurtosis values of the scales were between -2 and +2 (Table 2).

It was determined that the empathy scale scores of the participants showed a statistically significant difference according to their gender ($p<0.05$). Accordingly, it was seen that the empathy score of women was higher than that of men. It was determined that the empathy scale scores of the participants did not show a statistically significant difference according to their marital status, department, class, health insurance, income level, place of residence, and people they lived with ($p>0.05$) (Table 3).

It was found that, the happiness scale scores of the participants showed a statistically significant difference based on their income level ($p<0.05$). The happiness scale score of the group whose income exceeds expenses is higher than that of the other groups. According to multiple comparisons, the happiness scale score of the group whose income is higher than expenses is higher than that of the group whose income is lower than expenses. A statistically significant difference was found in the happiness scale scores of participants based on where they live ($p<0.05$). The happiness scale score of the group living in the province is higher than that of the other groups. According to multiple comparisons, the data show that the happiness scale score of the group living in the province is higher than the group living in the district. It was found that the happiness scale scores of the participants did not show a statistically significant difference according to their gender, marital status, department of study, class, health insurance, and the people they live with ($p>0.05$) (Table 4).

Table 1.
Participants' Information

Variables		Number	%
Age	($\overline{X}$: 21.11; SD: 3.86; min.-max.: 18-48)		
Gender	Male	45	16.1
	Female	235	83.9
Marital status	Single	269	96.1
	Married	11	3.9
Department	Operating room services	55	19.6
	Anesthesia	33	11.8
	First and emerhency aid	30	10.7
	Opticianry	31	11.1
	Medical imaging	26	9.3
	Medical laboratory	28	10
	Physiotherapy	17	6.1
	Oral and dental health	26	9.3
	Dialysis	34	12.1
Class	1st class	116	41.4
	2nd class	164	58.6
Health insurance	Yes	213	76.1
	No	67	23.9
Income level	Income less than expenses	64	22.9
	Income equal to expenses	154	55
	Income more than expenses	62	22.1
Place of residence	Province	182	65
	District	82	29.3
	Village	16	5.7
People living	Alone	13	4.6
	Mother, father, sibling	246	87.9
	Friend	9	3.2
	Spouse and children	12	4.3

SD=standard deviation, min.=minimum, max.=maximum

Table 2.
Scale Average Scores

Scales	Minimum	Maximum	$\overline{X}$	SD	Skewness	Kurtosis
Toronto empathy scale	32	65	54.67	6.58	-0.580	0.181
Oxford happiness scale	8	35	22.92	4.84	-0.106	-0.108

SD=standard deviation

Regression analysis was conducted to explain the effect of empathy on the happiness of the participants in the study. When the significance level corresponding to the F value is examined, it is seen that the established model is statistically significant ($F=8.187$; $p<0.05$). When the t value and significance levels of the ß coefficient of the independent variable are examined, empathy ($t=2.861$; ß=0.124) is seen to have a statistically significant effect on happiness ($p<0.05$). In this case, as scores obtained from empathy increase, happiness will increase. It is evident that 2.5% of the change in happiness is explained by empathy (Adjusted $R^2=0.025$) (Table 5).

Table 3.
Distribution of Empathy Scale Scores According to Participants' Characteristics

Variables		Empaty				
		Minimum	**Maximum**	**Median**	**SD**	$\bar{x}$
Gender	Male	32	65	51	50.64	8.30
	Female	34	65	55	55.44	5.91
	t	-4.646				
	p	0.000*				
Marital status	Single	32	65	55	54.59	6.62
	Married	47	63	57	56.55	5.37
	Z	-0.911				
	p	0.362				
Department	Operating room services	32	65	55	54.64	7.25
	Anesthetics	37	64	57	54.94	6,61
	First and emergency aid	40	65	56	55.40	6.81
	Opticianry	41	65	55	54.58	6.90
	Medical imaging	44	65	54.5	54.96	4.95
	Medical laboratory	34	65	56.5	54.82	7.13
	Physiotherapy	39	60	54	52.47	5.67
	Oral and dental health	38	65	55	53.81	7.05
	Dialysis	41	65	55.5	55.32	5.97
	KW	3.215				
	p	0.920				
Class	1st class	32	65	55	54.90	6.18
	2nd class	34	65	55	54.51	6.85
	t	0.481				
	p	0.631				
Health insurance	Yes	32	65	55	54.76	6.61
	No	38	65	55	54.39	6.51
	t	0.404				
	p	0.687				
Income levels	Income is less than expense	32	65	56	55.02	7.84
	Income is equal to expense	34	65	54.5	54.61	5.73
	Income is more than expense	37	65	55	54.47	7.19
	F	0.123				
	p	0.884				
Place of residence	Province	32	65	55	54.59	6.86
	District	39	65	56	55.51	5.48
	Village	38	63	52	51.31	7.66
	KW	4.22				
	p	0.121				
People living	Alone	40	65	52	54.92	7.62
	Mother, father, sibling	34	65	55	54.67	6.54
	Friend	32	60	55	52.44	8.08
	Spouse and children	47	63	55	56.17	5.29
	KW	0.871				
	p	0.833				

**=p<0.05 t-test, Mann-Whitney U test, one-way ANOVA (F) test and Kruskal-Wallis test, KW=Kruskal-Wallis test, SD=standard deviation*

Table 4.
Distribution of Happiness Scale Scores According to Participants' Characteristics

Variables		Happiness				
		Minimum	Maximum	Median	SD	$\overline{X}$
Gender	Male	8	31	22	22.53	5.6
	Female	11	35	23	23	4.76
	t	-0.587				
	p	0.558				
Marital status	Single	8	35	23	22.88	4.9
	Married	21	31	23	24	2.97
	Z	-0.790				
	p	0.429				
Department	Operating room services	16	35	23	23.65	4.28
	Anesthetics	12	30	22	22.06	4.59
	First and emergency aid	13	31	23.5	23.10	4.70
	Opticianry	12	35	22	22.45	4.90
	Medical imaging	12	34	22.5	22.38	5.70
	Medical laboratory	13	32	23	22.89	5.07
	Physiotherapy	8	30	21	21.35	5.65
	Oral and dental health	12	32	24.5	23.73	4.67
	Dialysis	11	32	23.5	23.44	4.96
	KW	5.625				
	p	0.689				
Class	1st class	13	35	22	22.76	4.39
	2nd class	8	35	23	23.04	5.14
	t	-0.473				
	p	0.637				
Health insurance	Yes	12	35	23	23.18	4.55
	No	8	32	22	22.09	5.62
	t	1.451				
	p	0.15				
Income levels	Income is less than expense (1)	8	35	21	21.58	5.18
	Income is equal to expense (2)	12	35	23	23.15	4.45
	Income is more than expense (3)	12	35	23	23.74	5.20
	F	3.593				
	p	0.029*				
	Bonferroni	1<3				
Place of residence	Province (1)	8	35	23	23.35	4.81
	District (2)	12	35	21	22.04	4.83
	Village (3)	12	29	22.5	22.56	4.93
	KW	6.227				
	p	0.044*				
	Bonferroni	2<1				
People living	Alone	18	35	25	25	4.65
	Mother, father, sibling	8	35	23	22.72	4.87
	Friend	17	32	24	24.89	4.86
	Spouse and children	15	31	23	23.25	3.84
	KW	3.597				
	p	0.308				

**=p<0.05 t-test, Mann-Whitney U test, one-way ANOVA (F) test and Kruskal-Wallis test, KW=Kruskal-Wallis test, SD=standard deviation*

Table 5.
Results of Regression Analysis Conducted to Explain the Effect of Empathy on Happiness

Dependent variable	Independent variable	ß	t	p	Beta	F	Model (p)	Adjusted R^2
Happiness	**Stable**	16.117	6.728	0.000*		8.187	0.005*	0.025
	Empaty	0.124	2.861	0.006*	0.169			

*=p<0.05 regression analysis

Discussion

The average age of the participants in the study was 21.11; 83.9% were women. The average empathy scale was 54.67 and the average happiness level was 22.92. The empathy level of women was found to be higher than that of men. Studies have shown that women are more empathic than men (15,16). A study has stated that women are more empathic stems from cultural expectations regarding gender roles (17). Another study has shown (18) that physiological structures and hormones can be effective in influencing bodily functions or processes. The level of happiness can vary depending on living conditions, education level, personality traits, and gender (19). Another study has found that the level of happiness increases as income increases (20). As a result of the study, the level of happiness was found to be high in those living in the city center and those with high income levels. This shows that happiness can vary depending on environmental conditions.

Empathy is achieved when a person understands another person's feelings correctly and can convey an appropriate response. People who realize that they receive empathy from others feel more understood and cared for. In a study conducted with medical school students, it was observed that empathy levels decreased throughout the education process (21). In the study conducted by Tutuk et al. (22), empathy was found to be at a moderate level in nursing students, and empathy increased as the years of education increased. In a different study, empathy scores were found to be high in nurses who worked in the clinic for a long time (23). There are also studies that have found a positive relationship between empathy and self-esteem (24). The study also found a high level of empathy. It is thought that empathy skills in students studying in health sciences may be affected by not only the fact that they are patients but also the education they receive and their personality traits.

Happiness motivates people to take action. Taking action and being happy make it easier to help other people. In a study where a significant positive relationship was found between happiness, well-being, and health, no statistically significant relationship was found between age, family income, personal income, and happiness (25). There are many factors that affect happiness. These factors can be personality traits (26,27), social support systems (28), socio-demographic characteristics, and living conditions (29,30). The study found a relationship between the happiness levels of health vocational school students and their economic status and place of residence; additionally, their happiness levels were found to be high. Health professionals, due to their jobs, are in constant communication with patient groups who need help. Therefore, the level of happiness among health service providers can be a determinant for the quality and satisfaction of the work done. In a study conducted with health sciences faculty, students in our country, no significant relationship was found between happiness levels, gender, and grades (31). Similarly, in our study, it was determined that happiness scale scores did not show a statistically significant difference according to gender, marital status, department, grade, health insurance, and people they lived with. Based on this, the factors affecting the level of happiness should be investigated more specifically. Studies examining the relationship between empathy and happiness in a student sample reveal a positive relationship between these variables (32,33). A study conducted by Thomas et al. (34) found that those with high empathy skills felt happier and had better interpersonal relationships. In a study conducted by Keleş (35), a strong correlation was found between communication and empathy. It is stated that empathy is related to various dimensions of happiness such as self-acceptance, personal development, and purpose in life (2,36). In addition, in a study conducted with nurses, it was stated that understanding the patient from the patient's perspective by empathizing and gaining respect will increase communication satisfaction, and as a result, work well-being and happiness levels will increase (37). As a result of the study, a significant positive relationship was found between empathy and happiness. Healthcare professionals should pay attention to their empathy and interpersonal relationships in order for service delivery to result in positive outcomes.

As a result of the study, the effect of empathy on happiness was found to be significant. In a study conducted by Viyanak and Judge (38), empathy was found to be a predictor of psychological well-being. In a different study, it was determined that happiness, one of the most basic emotions, has an important role in the formation of empathy (39). Happiness causes more activity, facilitates the individual's social relationships, and forms the basis for empathy. This situation shows that the level of happiness and empathy is important in healthcare professionals. Happy people cooperate at a higher level and happiness is associated with satisfaction; therefore, it has an accelerating role in the development process of society.

Study Limitations

This study was conducted with students from nine programs (first and emergency aid, operating room, anesthesia, medical laboratory, medical imaging, opticianry, oral and dental health, physiotherapy, and dialysis) in the Health Vocational School who volunteered to participate. The study is limited by the location and sample. There may be different programs in Health Service Vocational Schools throughout the country, so the differences cannot be generalized. Since there are no similar studies at the associate degree level in the literature, the discussion could be limited.

Conclusion

The empathic tendencies and happiness levels of the participants are high. The empathic tendencies and happiness levels of health professionals have an important place in the provision of quality and efficient health services. It is important that the data on the empathic tendencies and happiness levels of health professionals are regularly monitored by their managers; a good working environment and opportunities for self-improvement, together with necessary support, are provided. It is important to support participation in in-service training, scientific meetings, such as congresses and symposiums, and social and cultural events. In addition, it is recommended that new studies be conducted on empathy and happiness levels with a larger sample and different groups of health professionals. Increasing awareness of the empathy and happiness levels among professionals providing health services can enhance service provision. It is recommended that applied research be conducted in the future using positive psychological interventions to increase the level of empathy and happiness.

Ethics

Ethics Committee Approval: Ethical approval for the study was obtained from Akdeniz University Faculty of Medicine Clinical Research Ethics Committee and institutional permission was granted from the institution where the study was conducted. (decision no: KAEK-42, date: 11.01.2023).

Informed Consent: Voluntary consent forms were collected from participants.

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ORIGINAL ARTICLE

Is There a Difference Between Postpartum Depression and Mother-baby Bonding in Pregnant Women Who Had and Did Not Have COVID-19? A Comparative and Cross-sectional Study

COVID-19 Geçiren ve Geçirmeyen Gebelerde Doğum Sonrası Depresyon ve Anne-bebek Bağlanması Arasında Fark Var mıdır? Karşılaştırmalı ve Kesitsel Bir Çalışma

Gülnaz Karatay[1], Nazan Gürarslan Baş[1], Aslı Yüksekol[2]

[1]Department of Nursing, Munzur University Faculty of Health Science, Tunceli, Turkey
[2]Clinic of Neurology, Median Clinic, Flechtingen, Germany

Abstract

Objective: This study was conducted to examine the effect of being diagnosed with coronavirus disease-2019 (COVID-19) during pregnancy on postpartum depressive symptoms and infant-mother bonding.

Method: This comparative cross-sectional study was conducted in a city in southeastern Turkey. Using the purposeful sampling method, 210 postpartum women (106 had COVID during pregnancy, 104 did not) constituted the sample of the study. The data were collected through face-to-face interviews between 15 March and 30 May 2022. Data were collected using the mother introductory information form, mother-infant bonding scale, and Edinburgh postnatal depression scale. The obtained data were analyzed using percentages, means, t-test, chi-square, Mann-Whitney U, and regression analysis.

Results: According to the findings of the study, a significant relationship has been observed between contracting COVID-19 and both the birth weight of the baby and the week of birth. Moreover, having COVID-19 negatively affected infant-mother bonding and increased postpartum depressive symptoms.

Conclusion: According to the findings of the study: it was observed that the babies of mothers who had COVID-19 had lower birth weight, were born before the full term, mother-baby bonding was lower, and postpartum depression was higher in mothers.

Keywords: Coronavirus disease-2019, bonding, pregnancy, postpartum depression, newborn

Öz

Amaç: Bu çalışmada, gebelik sırasında koronavirüs hastalığı-2019 (COVID-19) tanısı almış olmanın, doğum sonrası depresif belirtiler ve anne-bebek bağlanması üzerine etkisinin incelenmesi amacıyla yapıldı.

Yöntem: Karşılaştırmalı türde planlanan bu kesitsel çalışma, Türkiye'nin güneydoğusunda bir şehirde gerçekleştirildi. Amaçlı örnekleme yöntemi kullanılarak seçilen 210 postpartum dönemindeki kadın (106'sı gebelikte COVID geçiren, 104'ü geçirmeyen) çalışmanın örneklemini oluşturdu. Çalışmanın verileri 15 Mart-30 Mayıs 2022 tarihleri arasında yüz yüze görüşme yöntemi ile toplandı. Veriler; anne tanıtım bilgi formu, anne-bebek bağlanma ölçeği ve Edinburgh doğum sonrası depresyon ölçeği kullanılarak toplandı. Elde edilen veriler SPSS veri tabanında yüzdelikler, ortalamalar, t-test, ki-kare, Mann-Withney U ve regresyon analizi kullanılarak analiz edildi.

Bulgular: Çalışmadan elde edilen bulgulara göre; COVID-19 enfeksiyonu geçirme durumu ile doğum haftası ve bebeğin doğum ağırlığı arasında anlamlı ilişki olduğu; benzer şekilde COVID geçirmenin anne bebek bağlanmasını olumsuz yönde etkilediği ve postpartum dönemde depresif yakınmaları artırdığı görüldü.

Sonuç: Çalışmada elde edilen bulgulara göre; Covid-19 geçiren annelerin bebeklerinin daha düşük doğum ağırlıklı olduğu, normal doğum haftasından daha erken dünyaya geldikleri, anne-bebek bağının daha düşük, annelerde doğum sonrası depresyonun daha yüksek olduğu görüldü.

Anahtar Kelimeler: Koronavirüs hastalığı-2019, bağlanma, gebelik, doğum sonrası depresyonu, yeni doğan

Corresponding Author:
Gülnaz Karatay, gkaratay@gmail.com

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Introduction

Coronavirus disease-2019 (COVID-19), which emerged as a global pandemic in early 2020, directly affects reproductive and perinatal health through direct infection, as well as indirectly due to changes in healthcare, social policies, or socio-economic circumstances (1). Therefore, pregnant women who are a unique group concerning mental and physical health needs had to cope with the burden of the pandemic during a critical care period as well as the usual stressors of the pre-and postnatal period (2).

Recent studies indicate that the virus's severity during pregnancy leads to increased morbidity and mortality (1,3-5). As the cardiorespiratory, circulatory, and immune systems undergo significant physiological changes during pregnancy, pregnant women become more vulnerable to various infections, including COVID-19 (6). Although intrauterine infection and vertical transmission of COVID-19 seem to be rare, the infection has been reported to cause an increased risk of pre-eclampsia, preterm birth, miscarriage, stillbirth, and low birth weight infants (4,7,8). On the other hand, beyond the direct effects of the pandemic stemming from infection, the repercussions of pandemic control policies, strain on health infrastructure, societal dynamics, and the global economy have directly impacted vulnerable groups, including pregnant women. In particular, the uncertainty of the impacts of COVID-19 on pregnancy, the concerns about its effects for generations and that these impacts will last for a long time in infants and children, the inability to establish cause-effect relationships related to the disease in general, hesitations about vaccination, limitations in access to healthcare, lack of evidence-based treatment options in pregnant women, domestic violence and increased poverty were among the factors that increased the psychological stress burden in pregnant women during this process (1,9).

Stress is a risk factor for postpartum depression, and it has been learned globally that the COVID-19 pandemic is a major source of stress. Published studies on the postpartum bonding experiences of mothers indicate that the burden of psychological stress increases in pregnant women due to the fear of COVID-19 during the pandemic, and this burden negatively affects the bonding process of mothers with their babies (2,10,11).

There are data indicating that the risk of postpartum depression is increased in women who have had COVID-19. Potential reasons for this include: the anxiety experienced by women during pregnancy becoming more pronounced in the postpartum period; the desire to stay strong for the baby during pregnancy giving way to emotional relaxation in the postpartum period; the physiological and psychological destruction that the disease process can cause; the fear of losing the baby; and many other factors such as the medications used. These factors can also negatively affect the mother-baby bonding process (1,2,8,11).

This study aims to explore the effect of having COVID-19 during pregnancy on postpartum depressive symptoms and infant-mother bonding in a city located in southeast Turkey: where people live in poverty, fertility is high, and education level is relatively low.

Main Points

- Having coronavirus disease-2019 (COVID-19) during pregnancy threatens both the baby's and mother's health.
- Bonding is negatively affected in mothers who have had COVID-19 during pregnancy.
- Having COVID-19 during pregnancy can lead to postpartum depressive symptoms.

Research Questions

1. Is there the relationship between having COVID-19 during pregnancy and birth characteristics?

2. Does contracting COVID-19 during pregnancy affect infant-mother bonding?

3. Does contracting COVID-19 during pregnancy affect postpartum depressive symptoms?

Material and Method

Study Design and Setting

This study was planned as a comparative cross-sectional study. The research was carried out in family health centers located in the city center. The province where the study was conducted was chosen because of its high fertility rates and its status as one of the riskiest provinces due to its demographic and cultural structure throughout the COVID-19 pandemic.

The study population comprised mothers residing in the city center, who sought vaccination for their babies against Hepatitis B at family health centers by the end of the first month. However, due to the large population, the study population was determined by two family health centers located in districts representing the most populous, poor, and middle-rich neighborhoods. G*Power analysis was used to determine the sample size. The sample size was calculated as 104 for each group and 208 people in total, taking alpha: 0.05, effect size: 0.5, and power: 0.95. Thus, considering the data losses, the study was completed with 210 participants.

Data Collection Tools

Research data were collected using the introductory information form, the mother-infant bonding scale (MIBS), and the Edinburgh postnatal depression scale (EPDS).

Mother Introductory Information Form

The form was developed by the researchers through a comprehensive review of the literature and subsequently validated through expert opinion. To evaluate the validity of the questionnaire, it was preliminarily applied to five participants, after which the questionnaire was formed.

The questionnaire included a total of 17 questions about the introductory characteristics of a mother (6 questions), the characteristics of fertility (5 questions), and the basic variables that may affect infant-mother bonding (6 questions).

Mother-infant bonding scale: MIBS, developed by Taylor et al. (12), is a 4-point Likert-type scale consisting of 8 items. There is a strong correlation between the bonding scores measured by the scale at the 3rd week, and at the 12th week. The scale is scored on a range of 0 to 24, with the lowest score being 0 and the highest being 24. In the assessment, the 1st, 4th, and 6th items denote positive emotional expressions and are scored as 0,1,2, or 3. Conversely, the 2nd, 3rd, 5th, 7th, and 8th items represent negative emotional expressions and are scored as 3,2,1, or 0 in reverse order. It was reported in the study of Taylor et al. (12) that the inter-rater reliability of the scale was 0.71 and the Cronbach's alpha coefficient was 0.66. In the adaptation study conducted by Karakulak and Alparslan (13) in Turkey, the Cronbach's alpha value of the scale was found to be between 0.66 and 0.85. In this last study, the Cronbach's alpha value was calculated as 0.61.

Edinburgh postnatal depression scale: EPDS was developed by Cox et al. (14) in 1987 to screen for postpartum depression in women. In our country, the validity and reliability of the scale were studied by Engin Deniz in 1996. The scale comprises 10 items, each evaluated on a 4-point Likert scale ranging from 0 to 3. scores range from 0 to 30, with higher scores indicating greater severity of depressive symptoms. For items 3, 5, 6, 7, 8, 9, and 10, scoring is reversed (3,2,1,0). A cut-off score of 12 is used, with individuals scoring above it considered at risk for depression. The Cronbach's alpha value for the scale was reported as 0.87 in previous studies and 0.86 in the current study, indicating high internal consistency.

Data Collection

The study data were collected between 15 March and 30 May using face-to-face interviews. Thus, breastfeeding rooms in family health centers were used. The period when the mother breastfed her baby or the baby slept was preferred during the interview, which lasted for 8-10 minutes on average. In cases where reliable data collection was not possible, the interview was ended.

Inclusion Criteria

- The mothers are in the first month of the postpartum period

- Babies are healthy and present at the family health centers for vaccination

- Mothers have no communication barriers

- Mothers do not have any acute psychiatric problems

Statistical Analysis

The data obtained in the study were analyzed using percentages, means, student's t-test, chi-square, Mann-Whitney U, and regression analysis after being transferred to the computer-aided SPSS database. The results were considered significant at the 95% confidence level and $p<0.05$.

Ethical Dimention

The Munzur University Non-interventional Research Ethics Committee permission was obtained for the collection of research data and the implementation of the research (approval no.: 2022/04-04, date: 25.02.2022). The study was conducted with consideration of the principles of the Declaration of Helsinki, informing the mothers about the purpose of the study, and obtaining consent from each mother who agreed to participate.

Results

The findings obtained in this study, which aimed to explore the effect of having COVID-19 during pregnancy on infant-mother bonding and postpartum depressive symptoms, are given below.

The descriptive data of both groups are similar. It was observed that 39.5% of the mothers included in the study had primary-secondary school education, 70.0% were not working, and 61.4% had income that covered their expenses (Table 1).

Considering some of the data on marriage and fertility of mothers with and without COVID-19: 5.2% of the mothers did not marry willingly, nearly half (49.0%) had 1-2 pregnancies, 43.3% had a miscarriage, the majority (73.3%) had 1-2 live births, 91.0% of them stated that their last pregnancy was planned, 42.4% of them stated that they got pregnant with medical treatment. When the sex of the babies is evaluated, it was seen that 57.1% of the births were female, and 57.1% of the mothers did not care about the sex of their baby (Table 2).

When the relationship between the mothers' status of having COVID-19 during pregnancy and birth characteristics was evaluated, it was found that while the mean gestational week was 37.28±2.10 weeks in mothers who had COVID-19, it was 38.61±0.72 weeks in those who did not. It was observed that the duration of pregnancy between the groups was statistically significantly different in favor of those who did not have COVID-19 ($t=6.096$, $df=208$, $p=0.001$). Similarly, while the average birth weight of the baby was 3041.89±588.676 grams in mothers who had COVID-19, it was 3516.54±405.690 grams in those who did not have it, and the difference was statistically significant in favor of those who did not have COVID-19 ($t=6.791$, $df=208$, $p=0.001$) While having COVID-19 was not found to be a factor affecting the mode of delivery ($U^*=5286.00$, $p=0.493$), it was observed that it significantly changed the initiation of breastfeeding ($U^*=4633.500$, $p=0.038$) (Table 3).

Table 1.
Some Descriptive Characteristics of the Participants

Characteristics	Mother having COVID-19 (%)	Mother not having COVID-19 (%)	Total (%)
Age ($\bar{X}$ ± SD)	2.74±5.168	29.29±4.845	29.51±5.004 (minimum: 19, maximum: 41)
Education			
Illiterate	6 (5.7)	14 (13.5)	20 (9.5)
Literate	6 (5.7)	- (-)	6 (2.9)
Primary-secondary school	25 (23.6)	26 (25.0)	51 (24.3)
High school	39 (36.8)	44 (42.3)	83 (39.5)
University and above	14 (28.3)	20 (19.2)	50 (23.8)
Employment			
Working	31 (29.2)	32 (30.8)	63 (30.0)
Not working	75 (70.8)	72 (69.2)	147 (70.0)
Income			
Income less than expense	30 (28.3)	29 (27.9)	59 (28.1)
Income equals expense	62 (58.5)	67 (64.4)	129 (61.4)
Income more than expenses	14 (13.2)	8 (7.7)	22 (10.5)
Total	**106 (50.5)**	**104 (49.5)**	**210 (100.0)**

COVID-19=coronavirus disease-2019, SD=standard deviation

Table 2.
Some Characteristics of the Participants Regarding Fertility

Characteristics	Mothers having COVID-19 n (%)	Mothers not having COVID-19 n (%)	Total n (%)
Marrying willingly			
Yes	94 (88.7)	83 (79.8)	177 (84.3)
No	6 (5.7)	5 (4.8)	11 (5.2)
Undecided	6 (5.7)	16 (15.4)	22 (10.5)
Number of pregnancies			
1-2 pregnancy	52 (49.1)	51 (49.0)	103 (49.0)
3-4 pregnancy	47 (44.3)	46 (44.2)	93 (44.3)
5 and above pregnancy	7 (6.6)	7 (6.7)	14 (6.7)
Miscarriage status			
Yes	43 (40.6)	48 (46.2)	91 (43.3)
No	63 (59.4)	56 (53.8)	119 (56.7)
Number of live births			
1-2	79 (74.5)	75 (72.1)	154 (73.3)
3-4	25 (23.5)	29 (27.8)	54 (25.7)
5 and above	2 (1.9)	- (-)	2 (1.0)
Willingly get pregnant			
Yes	95 (89.6)	96 (92.3)	191 (91.0)
No	11 (10.4)	8 (7.7)	19 (9.0)
Mode of conception			
Medical treatment	37 (34.9)	52 (50.0)	89 (42.4)
Naturally	69 (65.1)	52 (50.0)	121 (57.6)
Baby's sex			
Girl	47 (44.3)	43 (41.3)	90 (42.9)
Boy	59 (55.7)	61 (58.7)	120 (57.1)

Table 2. ***Continued***			
Preference for sex of child			
Girl Boy Does not matter	18 (17.0) 30 (28.3) 58 (54.7)	16 (15.4) 26 (25.0) 62 (59.6)	34 (16.2) 56 (26.7) 120 (57.1)
COVID-19=coronavirus disease-2019, SD=standard deviation			

Table 3. ***The relationship between having COVID-19 during pregnancy and birth characteristics***			
Characteristics	**Mothers having COVID-19 n (%)**	**Mothers not having COVID-19 n (%)**	**Total n (%)**
Birth week ($\bar{X}$ ± SD)	37.28±2.10	38.61±0.72	37.94±1.71
Significance test	t=6.096, df=208, p=0.001		
Type of birth			
Vaginal birth Interventional birth Cesarean birth	23 (21.7) 1 (0.9) 82 (77.4)	26 (25.0) 2 (1.9) 76 (73.1)	49 (23.3) 3 (1.4) 158 (75.2)
Significance test	U*=5286.00, p=0.493		
Baby's birth weight (grams) ($\bar{X}$ ± SD)	3041.89±588.676	3516.54±405.690	
Significance test	t=6.791, df=208, p=0.001		
First breastfeeding period after birth			
Immediate Within 1-2 hours Within 3-4 hours 4 hours or more	11 (10.4) 34 (32.1) 15 (14.2) 46 (43.4)	13 (12.5) 32 (30.8) 40 (38.5) 19 (18.3)	24 (11.4) 66 (31.4) 55 (26.2) 65 (31.0)
Significance test	U*=4633.500, p=0.038		
**=Mann-Whitney U, COVID-19= coronavirus disease-2019, SD= standard deviation*			

Within the scope of the study, the relationship between having COVID-19 during pregnancy and MIBS and EPDS was evaluated. While the mean MIBS score was 22.264 ±2.089 in mothers who had COVID-19, it was 23.817±1.439 in those who did not, and the difference was statistically significant (t=6.260, df=208, p=0.001). Similarly, while the mean EPDS score was 10.905±6.255 in mothers who had COVID-19, it was 7.269±3.899 in mothers who did not, and the difference was statistically significant (t=5.044 df=208 p=0.001) (Table 4).

In the multinomial logistic regression analysis conducted to understand the predictive factors affecting infant-mother bonding, such factors as education, income, and employment status, willingly marrying and becoming pregnant, mode of delivery, baby's sex, and COVID-19 status were evaluated together. It was found among these variables that COVID-19 status (p=0.01), education (p=0.02), income status (p=0.016), mode of conception (p=0.039), and baby's sex (p=0.05) were predictive factors for infant-mother bonding. Among these factors, it was determined that the most influential factor according to the p-value was the state of having COVID-19 (Table 4).

Discussion

Pregnant women are identified as the group experiencing the most problems during the COVID-19 pandemic, as they go through a complex and sensitive process (15). When the literature is examined, the available literature reports that acute stress during pregnancy has negative effects on maternal health. Uncertainties about COVID-19 disease, defined as an acute environmental stressor, social isolation due to being exposed to COVID-19, inability to access necessary care, and concerns about the disease harming the fetus can cause increased psychological distress, especially in mothers in the perinatal period. It has been reported that COVID-19 disease may affect the level of postpartum depression and infant-mother bonding in mothers during the postpartum period (16,17). However, no study has been found in the literature comparing the level of postpartum depression and infant-mother bonding in mothers with and without COVID-19. In this study, the levels of MIBS and EPDS in mothers with and without COVID-19, as well as related factors, were examined in the light of the literature.

It was observed in this study that the average gestational week and average birth weight of the baby of mothers who had COVID-19 during pregnancy were lower than those who

Table 4.
The relationship between having COVID-19 during pregnancy and MIBS and EPDS

Characteristics	Mothers having COVID-19 ($\bar{X}$ ± SD)	Mothers not having COVID-19 ($\bar{X}$ ± SD)	Total $\bar{X}$ ± SD
MIBS	22.264±2.089	23.817±1.439	23.033±1.954
Significance test	t=6.260, df=208, p=0.001		
EPDS	10.905±6.255	7.269±3.899	9.104±5.520
Significance test	t=5.044, df=208, p=0.001		

COVID-19=coronavirus disease-2019, SD=standard deviation, MIBS=mother-infant bonding scale, EPDS=Edinburgh postnatal depression scale

did not, and that having COVID-19 changed the initiation of breastfeeding. In some studies, being COVID positive during pregnancy significantly increases the risk of low birth weight (1,7). These effects may be related to changes in nutritional patterns during the pandemic, decreased oxygenation levels due to disease, inadequate antenatal care, short gestation periods, and psychological distress. It was determined that the mean MIBS score in mothers who had COVID-19 was lower than those who did not and the mean EPDS score was higher than those who did not. The literature reports that during the pandemic, mothers in the postpartum period are worried about their health as well as the health of their loved ones, have mental problems, and that the process affects their parenting roles (9,18). Fernandes et al. (9) stated in their study that 27.5% of the mothers showed anxiety and depressive symptoms, and that mothers who gave birth during the COVID-19 pandemic had poorer and impaired infant-mother bonding than those who gave birth in the pre-pandemic period. Liu et al. (19) reported the mean postpartum depression score in mothers as 13.24 and the infant-mother bonding score average as 78.82. Suziki et al. (15) during the COVID-19 pandemic, it was reported that infant-mother bonding was poor in the first month after birth, and, in another study, postpartum depression increased during the 3-4 month period (20). Findings from this and other studies have shown that mothers who had COVID-19 during the pandemic are affected more negatively and that having COVID-19 has an effect on postpartum depression and infant-mother bonding.

In this latest study, it was found that having COVID-19, education and income status, mode of conception, and baby's sex were predictive factors for infant-mother bonding. Among these factors, the most influential factor was having COVID-19. In their study, Liu et al. (19) found a relationship between first pregnancy, young age, lack of support, and postpartum depression levels. It has been stated that experiencing COVID-19 related sadness was associated with low maternal bonding, while a high level of social support and maternal self-efficacy was associated with a high level of maternal bonding. It is stated in other studies as well that anxiety and sadness experienced during the pandemic process reduce the level of infant-mother bonding (2,21-23). Contrary to the results of this study, Chang et al. (24) reported that postpartum depression levels in pregnant women increased significantly during the pandemic process, but mother-infant bonding levels were not affected. Wilson et al. (25) stated that the visitor restriction during the pandemic and the fact that mothers spend more time at home and with their babies relax them and positively affect bonding. Handelzalts et al. (11) found that the higher COVID-19 anxiety, the higher the relationship between PDS and bonding. When examining the literature, it is emphasized that the prevalence of postpartum depression may be influenced by various factors, including the personal characteristics of the pregnant woman, societal factors, and extraordinary circumstances such as pandemics. Studies related to postpartum depression have reported prevalence rates ranging from 17.4% to 24% (10,26). Risk factors associated with postpartum depression include mental health issues, unintended pregnancies, low income, marital discord, and being a homemaker (26). According to the findings obtained from this and other studies, it is thought that the factors affecting the EPDS and MIBS levels of mothers vary during the pandemic process. This variability may be caused by sociological, economic, and cultural differences. Although the predictors affecting the MIBS level differ in the studies, it has been observed that the most important predictors related to the MIBS level are the education level of the mother and having COVID-19.

Study Limitations

The findings of the study are limited to the data obtained from pregnant women living in a province in Southeastern Turkey during the COVID-19 pandemic, and the results can only be generalized to this specific group.

Conclusion

The study found that mothers with COVID-19 gave birth to babies with lower birth weight, gave birth earlier than a normal week of delivery, and had lower MIBS and higher EPDS. It was determined that the most important factors affecting the MIBS level were the education level of the mother and having COVID-19. It is recommended that nurses and midwives make psychological assessments of pregnant and postpartum mothers they care for using scales during pandemic periods. In addition, planning and providing care to pregnant and postpartum mothers who are psychologically affected will play an important role in improving maternal and infant health.

Ethics Committee Approval: The study was approved by the Munzur University Non-interventional Research Ethics Committee (approval no: 2022/04-04, date: 25.02.2022).

Informed Consent: The study was conducted with consideration of the principles of the Declaration of Helsinki, informing the mothers about the purpose of the study, and obtaining consent from each mother who agreed to participate.

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ORIGINAL ARTICLE

Mediation and Moderation Effects of 21st-century Skills, on the Relationship Between Self-compassion and Resilience in Nursing Students: A Cross-sectional Study

Hemşirelik Öğrencilerinde Öz-şefkat ve Psikolojik Dayanıklılık Arasındaki İlişkide 21. Yüzyıl Becerilerinin Aracılık ve Düzenleyicilik Etkisi: Kesitsel Bir Çalışma

Sevda Yıldırım[1], Cansu Akdağ Topal[2]

[1]Department of Obstetrics and Gynecologic Nursing, Hacettepe University Faculty of Nursing, Ankara, Turkey
[2]Department of Nursing, Başkent University Faculty of Health Sciences, Ankara, Turkey

Abstract

Objective: This study investigates the mediating and moderating roles of 21st-century skills in the relationship between self-compassion and resilience among nursing students.

Method: This was a cross-sectional and descriptive study. The participants were nursing students from two universities. Study data was collected between November 2023 and December 2023. A participant information form, self-compassion scale short form, multidimensional 21st-century skills scale, and resilience scale for adults were used to collect data from nursing students (n=396). Mediating and moderating analyses were used to examine the potential mediating and moderating role of 21st-century skills in the relationship between self-compassion and resilience.

Results: Correlation analyses indicated that 21st-century skills, self-compassion, and resilience were significantly associated (p<0.05). Twenty-first-century skills, information and technology literacy skills, entrepreneurship and innovation skills, social responsibility and leadership skills significantly mediate the relationship between self-compassion and resilience (p<0.05). Moderation analysis indicated that critical thinking and problem-solving skills moderated the relationship between self-compassion and resilience (β=0.139, p<0.05).

Conclusion: Integrating self-compassion training and fostering 21st-century skills in nursing education is crucial for supporting future healthcare professionals' success and well-being. These interventions enhance resilience, enabling students to cope better with challenges.

Keywords: Nursing education, self-compassion, resilience, 21st-century skills, nursing students

Öz

Amaç: Araştırmanın amacı hemşirelik öğrencilerinde öz-şefkat ve psikolojik dayanıklılık arasındaki ilişkide 21. yüzyıl becerilerinin aracı ve düzenleyici etkisini incelemektir.

Yöntem: Kesitsel ve tanımlayıcı tipte bir araştırmadır. Araştırmanın örneklemini, iki farklı üniversiteden hemşirelik öğrencileri oluşturmuştur. Çalışma verileri Kasım 2023 ile Aralık 2023 tarihleri arasında toplanmıştır. Veriler, hemşirelik öğrencilerinden (n=396) katılımcı bilgi formu, öz-şefkat ölçeği kısa formu, çok boyutlu 21. yüzyıl becerileri ölçeği ve yetişkinler için psikolojik dayanıklılık ölçeği ile toplanmıştır. Öz-şefkat ve psikolojik dayanıklılık arasındaki ilişkide 21. yüzyıl becerilerinin potansiyel aracı ve düzenleyici rolünü incelemek için aracılık ve düzenleyicilik analizleri yapılmıştır.

Bulgular: Korelasyon analizleri, 21. yüzyıl becerileri, öz-şefkat ve psikolojik dayanıklılık arasında anlamlı bir ilişki olduğunu göstermiştir (p<0,05). Yirmi birinci yüzyıl becerileri, bilgi ve teknoloji okuryazarlığı becerileri, girişimcilik ve yenilikçilik becerileri, sosyal sorumluluk ve liderlik becerileri, öz-şefkat ile psikolojik dayanıklılık arasındaki ilişkide anlamlı bir aracılık rolü oynamıştır (p<0,05). Düzenleyicilik analizi, eleştirel düşünme ve problem çözme becerilerinin öz-şefkat ile psikolojik dayanıklılık arasındaki ilişkiyi düzenlediğini göstermiştir (β=0,139, p<0,05).

Corresponding Author:
Sevda Yıldırım, sevda.yildirim@hacettepe.edu.tr

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Sonuç: Öz-şefkat eğitimini entegre etmek ve hemşirelik eğitiminde 21. yüzyıl becerilerini geliştirmek, geleceğin sağlık profesyonellerinin başarılarını ve iyi oluşlarını desteklemek için kritik öneme sahiptir. Bu müdahaleler, öğrencilerin zorluklarla daha iyi başa çıkmasını sağlayarak psikolojik dayanıklılığı artırmaktadır.

Anahtar Kelimeler: Hemşirelik eğitimi, öz-şefkat, psikolojik dayanıklılık, 21. yüzyıl becerileri, hemşirelik öğrencileri

Introduction

Nursing students face numerous challenges during their educational journey, such as emotional strain, demanding exams, balancing personal and professional responsibilities, heavy workloads, and difficult clinical experiences (1). To navigate these challenges effectively, students benefit from developing resilience, which refers to the ability to adapt and recover from adversity. Resilience helps students cope with both academic and personal stressors, allowing them to succeed in their studies and future careers as nurses (2). In the context of professional nursing, resilience is also critical for long-term career sustainability, as nurses regularly encounter high-stress situations, patient suffering, and emotionally taxing work environments. Developing resilience early in their training equips nursing students to handle these realities throughout their careers.

One key factor that fosters resilience is self-compassion. Self-compassion entails acknowledging that one's own challenges are a natural part of life and treating oneself with care and understanding when things get tough (3). Students who practice self-compassion are more likely to be resilient, according to research, since they demonstrate higher levels of intrinsic desire, less fear of failing, and more confidence in their skills (4,5). Moreover, self-compassion contributes to emotional well-being and allows individuals to approach challenges with a constructive mindset, ultimately enhancing personal and professional growth (6). For professional nurses, self-compassion is equally important, as it helps mitigate burnout and compassion fatigue, which are prevalent in healthcare environments. Nurses who practice self-compassion are better equipped to provide empathetic care while maintaining their own emotional health.

In addition to self-compassion, nursing students must learn 21st-century skills in order to fulfill the demands of contemporary healthcare. These skills-like problem-solving, cooperation, communication, and decision-making-are essential for addressing the complexities of patient care in an increasingly fast-paced, technology-driven environment (7). By equipping themselves with these competencies, nursing students can better manage the diverse challenges of their profession and deliver high-quality, empathetic care (8). For professional nurses, these skills are indispensable in managing patient care effectively, especially in interdisciplinary teams and rapidly changing clinical settings. The ability to adapt, make informed decisions, and communicate clearly with both patients and colleagues is fundamental to ensuring positive health outcomes.

Main Points

- Self-compassion and resilience were found to positively correlate with 21st-century skills.
- Mediation analysis revealed that self-compassion had significant indirect effects on resilience through various 21st-century skills sub-dimensions, particularly in information and technology literacy, entrepreneurship and innovation, social responsibility and leadership.
- Critical thinking and problem-solving skills were found to significantly moderate the relationship between self-compassion and resilience.

Although the relationship between resilience and self-compassion has been previously studied (9,10), no study has yet been found that examines the role of 21st-century skills as both a mediator and moderator in this relationship. This study addresses this gap in the literature by exploring how 21st-century skills influence the connection between nursing students' resilience and self-compassion. By doing so, it offers valuable insights for nursing education and professional development, particularly in strengthening skills that promote both resilience and self-compassion. Unlike prior studies, which have primarily focused on resilience or self-compassion independently (11-14), our research highlights the multifaceted role of 21st-century skills such as critical thinking, technological literacy, and social responsibility-skills that are crucial in contemporary nursing practice. Furthermore, the application of mediation and moderation models provides a unique methodological approach, not widely explored in existing literature. A comparison with similar studies shows that, while other research has investigated self-compassion and resilience separately, none has examined the interactive effects of 21st-century skills, making our findings both novel and significant.

The Mediation and Moderation Hypothesis

The effect of self-compassion on resilience occurs indirectly simultaneously via six mediators and moderators [the multidimensional 21st-century skills scale (MCSS), information and technology literacy skills (ITLS), critical thinking and problem-solving skills (CTPSS), entrepreneurship and innovation skills (EIS), social responsibility and leadership skills (SRLS), and career awareness (CA) see Figure 1 for the multiple mediator and moderator model]:

1. Self-compassion is positively correlated with resilience among nursing students.

2. MCSS mediate the correlations between self-compassion and resilience.

3. a) ITLS, b) CTPSS, c) EIS, d) SRLS, and e) CA mediate the correlations between self-compassion and resilience.

4. MCSS moderate the correlations between self-compassion and resilience.

5. a) ITLS, b) CTPSS, c) EIS, d) SRLS, and e) CA moderate the correlations between self-compassion and resilience.

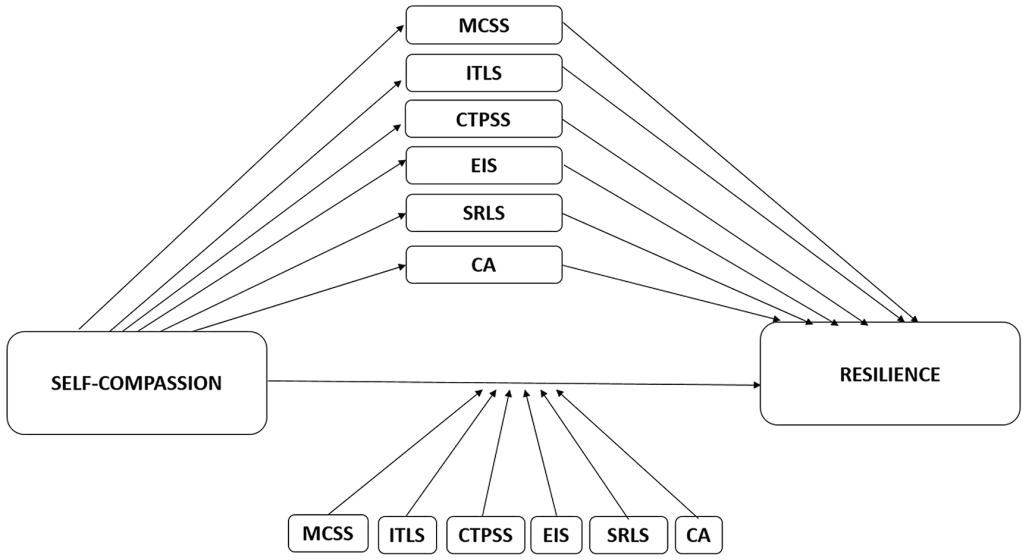

Figure 1.
Multiple Mediator and Moderator Models Depicting Students' Self-compassion and Resilience, Tested in the Current Study
MCSS=the multidimensional 21st-century skills scale, ITLS=information and technology literacy skills, CTPSS=critical thinking and problem-solving skills, EIS=entrepreneurship and innovation skills, SRLS=social responsibility and leadership skills, CA=career awareness

Material and Method

Design

This descriptive study was conducted from November 2023 to December 2023.

Settings and Participants

The study was carried out in two universities' nursing departments, and the sample was selected using convenience sampling from these departments. Participants were chosen based on the following inclusion criteria: (1) age ≥18 years; (2) current enrollment as an undergraduate nursing student at the participating universities; and (3) willingness to participate in the study. The exclusion criteria included incomplete questionnaire responses or a lack of willingness to participate. As recommended by Kline (15), the sample size for this study was determined using a methodological approach that relied on the ratio of the number of participants (n) to the model parameters (q). Ten relevant parameters (age, gender, class, family structure, mother's education level, father's education level, perceived economic situation, people live with, self-compassion level, and resilience level) were identified through structural equation modeling and multiple linear regression analysis to assess the influences on self-compassion. A minimum of five observations per parameter, ten cases per parameter, and an overall sample size that fell between 100 and 200 cases were considered in the sample size determination (15). Based on these calculations, the minimum required sample size was determined to be 100 students. However, a total of 396 nursing students participated in the study, exceeding the minimum requirement and ensuring sufficient statistical power.

Data Collection Instruments

MCSS, the self-compassion scale (SCS) short form, the brief resilience scale (BRS) for adults, and the participant information form were used to gather data.

Participant Information Form

After a review of pertinent research (16,17), the participant information form was created as a questionnaire to gather socio-demographic information from students. Age, gender, class year, perceived economic status, family structure, parental education levels, and living conditions are just a few of the variables that are covered in the questionnaire.

MCSS

To measure competence of 21st-century skills, MCSS was created. Cevik and Senturk (18) verified the validity and reliability of MCSS in Turkish. It consists of five sub-dimensions: CA, CTPSS, EIS, SRLS, and ITLS. Participants use a 5-point Likert scale to score their level of agreement with 41 items: strongly agree (5) to strongly disagree (1). There are seven reverse-scored items. By adding up all of the item scores and dividing by 41, the average score is calculated. Higher scores indicate greater proficiency in 21st-century skills. The Cronbach's alpha was 0.86 (18). In this study, the Cronbach's alpha value was found to be 0.91.

SCS Short Form

The SCS is employed to evaluate students' self-compassion levels. Widely utilised in surveys across numerous countries, the short form applies to diverse demographic groups and has been successfully employed with college students. Respondents rate their agreement with various statements using a five-point Likert scale ranging from 1 (almost never) to 5 (almost always). The final score on the SCS short form falls within the range of 12 to 70, with higher scores indicative of greater self-compassion levels (19). In this study, the Cronbach's alpha value was found to be 0.83.

BRS for Adults

A valid and reliable tool for evaluating human resilience is the BRS, which was first created by Smith et al. (20) and translated into Turkish by Doğan (21). Comprising six items, respondents use a scale of 1 (strongly disagree) to 5 (strongly agree) to indicate how much they agree with each of the statements. The range of total points is 6 to 30. The BRS is scored by reversing the coding of items 2, 4, and 6, and then figuring out the average of all item scores. A score of ≥3.99 indicates high resilience, whereas a score of ≤2.95 indicates poor resilience for individuals and the overall population. For females, a score of ≥2.87 indicates poor resilience, while a score of ≥3.91 indicates high resilience (20). In this study, the Cronbach's alpha value was found to be 0.88.

Data Collection

An online Google Forms survey was used to gather the data during November and December of 2023. Access to the survey link was facilitated through a QR code, allowing participants to use mobile phones or computers. The survey was distributed through WhatsApp groups catering to students. Participants were provided with information regarding the research's objectives and significance and were assured of the confidentiality of their data. Additionally, measures were implemented to ensure users could only complete the questionnaire once.

Statistical Analysis

In the study's statistical analysis, various methodologies were utilised, encompassing descriptive statistics, correlation analyses, reliability assessments employing Cronbach's alpha coefficient, regression modelling, and mediation and moderation analyses. Pearson correlation coefficient was employed to explore the relationships among scale scores, with the correlation results graphically presented using the ggcorrplot package in the R program (22). The subscale and total scores of the 21st-century skills scale functioned as mediator and moderator variables, respectively.

Self-compassion was designated as the independent variable, while the resilience scale was the dependent variable. Mediation analyses entailed generating a bootstrap sample (n=5000) to assess the significance of indirect effects, emphasising whether the confidence intervals of indirect effects encompassed zero. For mediation analyses, bootstrap-based linear regression was used with 5000 resampling iterations. For moderation effect analyses, Z-scores were computed for the variables, and the significance of interaction coefficients was evaluated. Moderation analyses were conducted using hierarchical regression analysis. The threshold for statistical significance was set at $p<0.05$ for all analyses. IBM SPSS 27 software was used for all analyses, with the PROCESS plug-in used as a supplement.

Ethical Considerations

This study was approved by the Başkent University's Ethics Board (approval no: E-62310886-605.99-239101, date: 07.11.2023). Ethical approval was obtained in accordance with the principles set forth in the Declaration of Helsinki. Before participation, all respondents were provided with comprehensive written information regarding the study's purpose, procedures, and potential risks. Each participant provided informed consent, affirming their voluntary participation and understanding of their rights throughout the study. The confidentiality and privacy of the participants were ensured by anonymising all data. Participants were also assured that their responses would be kept confidential and used solely for the purpose of the research. Measures were put in place to protect participants' personal information and to ensure their rights and welfare were upheld during the study.

Results

The students' ages ranged from 18 to 29 years old, with a mean age of 20.84 years (standard deviation 1.53). Most students in the present sample were females (88.1%). Approximately 40.9% of the students were in their first year, 85.6% reported belonging to nuclear families, and 56.8% indicated living with friends. Moreover, 41.1% of the students' mothers had an education level below secondary school, whereas only 24.0% of the students' fathers had similar educational attainment (Table 1).

Figure 2 illustrates the bivariate correlation matrix among the study variables. In particular, self-compassion ($r=0.25$, $p<0.005$) and resilience ($r=0.29$, $p<0.005$) were found to positively correlate with 21st-century skills. Skills related to entrepreneurship and innovation ($r=0.19$, $p<0.005$), information and technology literacy ($r=0.22$, $p<0.005$), social responsibility and leadership ($r=0.15$, $p<0.005$), and career awareness ($r=0.15$, $p<0.005$) were found to be positively correlated with self-compassion. Additionally, entrepreneurship and innovation skills ($r=0.33$, $p<0.005$), information and technology literacy skills ($r=0.18$, $p<0.005$), social responsibility and leadership skills ($r=0.22$, $p<0.005$), and career awareness ($r=0.12$, $p<0.005$) were found to positively correlate with resilience.

Table 1. Participant Demographics (n=396)		
	n	**%**
Age 20.84±1.53 (min: 18.00; max: 29.00)		
Gender		
Female	349	88.1
Male	44	11.1
Prefer not to say	3	0.8
Class		
1.	162	40.9
2.	81	20.5
3.	76	19.2
4.	77	19.4
Family structures		
Nuclear family	339	85.6
Extended family	37	9.3
Single-parent family	20	5.1
Mother's education level		
Less than secondary school	163	41.1
Secondary school graduate	76	19.2
High school and more graduate	157	39.6
Father's education level		
Less than secondary school	95	24.0
Secondary school graduate	77	19.5
High school and more graduate	224	56.5
Perceived economic situation		
Income more than expense	60	15.2
Income equals expense	290	73.2
Income less than expense	46	11.6
Live with		
Family	133	33.6
Friends	225	56.8
Alone	38	9.6

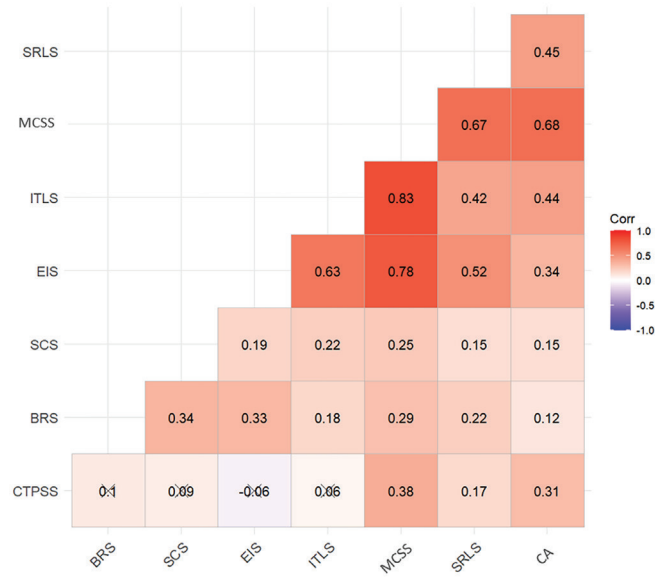

Figure 2.
Correlation Between Scale and Sub-dimension Scores
SRLS=social responsibility and leadership skills, MCSS=the multidimensional 21st-century skills scale, ITLS=information and technology literacy skills, EIS=entrepreneurship and innovation skills, SCS=self-compassion scale, BRS=brief resilience scale, CTPSS=critical thinking and problem-solving skills, CA=career awareness

Mediation Analyses

The results pertaining to the mediation function of the sub-dimensions and total levels of 21st century skills are shown in Table 2. The indirect effects of each mediator were examined in this analysis since all six mediators (21st skills and its sub-dimensions) were entered at the same time. The findings showed that self-compassion and 21st-century skills were positively correlated, and that resilience was favorably correlated with 21st-century skills. Similarly, self-compassion positively correlated with the three sub-dimensions of 21st-century skills (information and technology literacy, entrepreneurship and innovation, social responsibility and leadership), and these sub-dimensions were positively associated with resilience. Self-compassion was found to have significant indirect effects on resilience through 21st century skills, information and technology literacy, entrepreneurship and innovation, social responsibility and leadership (Figure 3). The models' critical thinking, problem-solving, and career awareness coefficients' confidence intervals, however, indicate that these variables do not substantially mediate (Table 2).

Moderation Analysis

Hypotheses 4 and 5 were assessed through regression analysis, specifically by regressing the self-compassion score on the resilience score and its interaction with the 21st century skills and its sub-dimension scores. SCS and the CTPSS had a significant interaction [B=0.139, 95% confidence interval (CI) (0.052, 0.227), p<0.05], as shown in Figure 3, indicating that the relationship between resilience and self-compassion was moderated by CTPSS. The association between self-compassion and resilience is only moderated by CTPSS, according to the overall findings (Table 3).

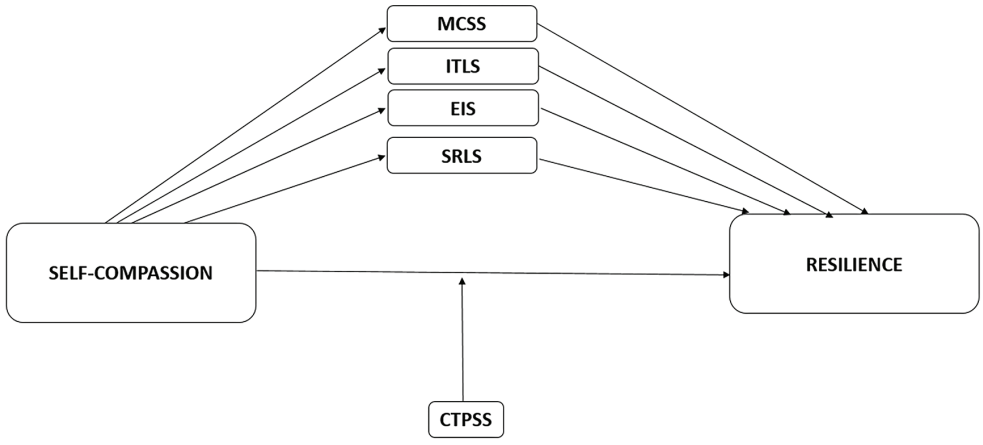

Figure 3.
Multiple Mediator and Moderator Models Depicting Students' Self-compassion and Resilience
MCSS=the multidimensional 21st-century skills scale, ITLS=information and technology literacy skills, EIS=entrepreneurship and innovation skills, SRLS=social responsibility and leadership skills, CTPSS=critical thinking and problem-solving skills

Table 2. Mediator Model Analyses Using 5,000 Bootstraps (n=396)

Mediations	**Effect types**	**Statistics**			
SCS→ITLS→BRS	Direct effect	Coefficient	SE	LBCI	UBCI
		0.418	0.064	0.293	0.543
	Indirect effect	Coefficient	BootSE	Boot-LBCI	Boot-UBCI
		0.032	0.017	0.002	0.069
SCS→CTPSS→BRS	Direct effect	Coefficient	SE	LBCI	UBCI
		0.442	0.063	0.319	0.565
	Indirect effect	Coefficient	BootSE	Boot-LBCI	Boot-UBCI
		0.009	0.009	-0.006	0.028
SCS→EIS→BRS	Direct effect	Coefficient	SE	LBCI	UBCI
		0.380	0.061	0.260	0.500
	Indirect effect	Coefficient	BootSE	Boot-LBCI	Boot-UBCI
		0.071	0.023	0.030	0.118
SCS→SRLS→BRS	Direct effect	Coefficient	SE	LBCI	UBCI
		0.416	0.062	0.294	0.538
	Indirect effect	Coefficient	BootSE	Boot-LBCI	Boot-UBCI
		0.035	0.015	0.010	0.067
SCS→CA→BRS	Direct effect	Coefficient	SE	LBCI	UBCI
		0.437	0.063	0.313	0.560
	Indirect effect	Coefficient	BootSE	Boot-LBCI	Boot-UBCI
		0.014	0.011	-0.005	0.039
SCS→MCSS→BRS	Direct effect	Coefficient	SE	LBCI	UBCI
		0.379	0.063	0.256	0.502
	Indirect effect	Coefficient	BootSE	Boot-LBCI	Boot-UBCI
		0.072	0.023	0.031	0.121

SE=standart error, Boot=bootstrapped, LBCI=lower bound confidence interval, UBCI=upper bound confidence interval, MCSS=the multidimensional 21st-century skills scale, ITLS=information and technology literacy skills, CTPSS=critical thinking and problem-solving skills, EIS=entrepreneurship and innovation skills, SRLS=social responsibility and leadership skills, CA=career awareness, SCS=self-compassion scale, BRS=brief resilience scale

Table 3. Moderation Model Analysis (n=396)						
Moderators	**Regressors**	**Coefficient**	**SE**	**LBCI**	**UBCI**	**R^2**
ITLS	Constant	-0.005	0.048	-0.099	0.090	0.129
	Z-SCS	0.316	0.049	0.221	0.411	
	Z-ITLS	0.108	0.049	0.013	0.203	
	Interaction	0.022	0.043	-0.061	0.106	
CTPSS	Constant	-0.013	0.047	-0.105	0.079	0.143
	Z-SCS	0.348	0.047	0.255	0.440	
	Z-CTPSS	0.064	0.047	-0.029	0.156	
	Interaction	0.139	0.045	0.052	0.227	
EIS	Constant	0.008	0.046	-0.083	0.099	0.192
	Z-SCS	0.290	0.046	0.199	0.381	
	Z-EIS	0.277	0.046	0.186	0.368	
	Interaction	-0.040	0.045	-0.128	0.049	
SRLS	Constant	0.003	0.047	-0.090	0.095	0.146
	Z-SCS	0.317	0.047	0.224	0.410	
	Z-SRLS	0.174	0.047	0.081	0.267	
	Interaction	-0.018	0.048	-0.111	0.076	
CA	Constant	-0.009	0.048	-0.102	0.085	0.127
	Z-SCS	0.337	0.048	0.243	0.431	
	Z-CA	0.072	0.048	-0.022	0.165	
	Interaction	0.062	0.044	-0.025	0.148	
MCSS	Constant	-0.009	0.047	-0.103	0.084	0.164
	Z-SCS	0.288	0.048	0.194	0.382	
	Z-MCSS-21	0.215	0.048	0.121	0.309	
	Interaction	0.038	0.044	-0.048	0.124	

SE=standart error, LBCI=lower bound confidence interval, UBCI=upper bound confidence interval, R^2=coefficient of determination, Z=Z score, ITLS=information and technology literacy skills, CTPSS=critical thinking and problem-solving skills, EIS=entrepreneurship and innovation skills, SRLS=social responsibility and leadership skills, CA=career awareness, SCS=self-compassion scale, MCSS=the multidimensional 21st-century skills scale

Discussion

This study examined the mediation and moderation effects of 21st-century skills on the relationship between nursing students' resilience and self-compassion. These findings have important implications for professional nursing as well, as both self-compassion and 21st-century skills are critical not only during education but also throughout nurses' careers. The ability to maintain resilience and adapt to the evolving demands of healthcare is essential for delivering high-quality care, managing stress, and preventing burnout in professional practice. We find out the important connection between nursing students' resilience and self-compassion. In their study, Zhao et al. (9) sought to investigate and analyze a model outlining possible pathways between self-compassion and depressive symptoms, and they found a substantial correlation between resilience and self-compassion. The study conducted by Lancaster et al. (10) sought to determine the degree of self-compassion and resilience among nursing students and discovered a strong correlation between the two variables. Similar to our findings, the study by Siware and Paul (23) also found a strong positive correlation between self-compassion and resilience. There are a number of reasons why self-compassion and resilience are related, such as better coping mechanisms, fewer negative feelings, better problem-solving skills, more social support, and better stress management. This discovery aligns with multiple studies delving into similar relationships (24,25). The positive connection between nursing students' resilience and self-compassion highlights the importance of encouraging self-kindness and actions to support future nurses' happiness and career advancement.

Moreover, our results indirectly align with our hypotheses on the role that 21st-century skills, information and technology literacy, entrepreneurship and innovation, social responsibility, and leadership play in mediating the relationship between resilience and self-compassion. To the best of our knowledge, research has focused on the relationship between 21st-century skills and resilience

(26) and self-compassion (27), but has not yet examined the mediation effects of 21st-century skills between resilience and self-compassion. Furthermore, students who exhibit a strong degree of self-compassion can develop the psychological resources essential for successfully overcoming challenges. Self-compassion indirectly fosters proficiency in 21st-century skills, encouraging emotional intelligence, adaptability, collaboration, critical thinking, resilience, and a growth mindset (28). In the study by Potts and Le Hunte (29), it is suggested that students' ability to cope with uncertainty and develop resilience can be more easily cultivated as a result of self-compassion. Specifically, it is emphasized that self-compassion, supported by 21st-century skills, enhances students' motivation to help others, reinforcing resilience and facilitating their ability to manage stress (29). These findings highlight the mediating effect of 21st-century skills and their role in strengthening the relationship between self-compassion and resilience.

The association between resilience and self-compassion is influenced by the mediating role of ITLS. Potts and Le Hunte (29) highlight the role of 21st-century skills, such as information and technology literacy, in enhancing resilience through self-compassion. Our study similarly finds that self-compassion, when supported by these skills, facilitates the development of resilience by helping students better manage obstacles. The ability to effectively use technology and information resources allows individuals to overcome challenges more efficiently, as they can access tools that support emotional and cognitive well-being (30). This can be explained by the fact that people who have higher degrees of self-compassion are better able to overcome obstacles because they are more adept at using technology and knowledge.

In our study, it was concluded that the effect of self-compassion on resilience is strengthened through entrepreneurial and innovative skills. Self-compassion enhances individuals' ability to cope with challenges and develop creative thinking skills, while also promoting flexibility and risk tolerance in innovative and entrepreneurial thinking processes (31). Consistent with our findings, the literature emphasizes that developing entrepreneurship and resilience skills helps students cope with challenges (32,33). Similarly, our study found that entrepreneurial and innovative skills strengthen students' resilience. These skills enhance psychological flexibility, helping individuals cope with future uncertainties. In the healthcare field, the importance of these qualities is even greater, as the ability to produce innovative solutions directly impacts individuals' professional resilience. Liu et al. (34) emphasize the need to increase creativity and innovation in healthcare education, which has the potential to improve the quality of healthcare services.

The relationship between resilience and self-compassion is influenced by the mediating role of SRLS. In the context of self-compassion and resilience, the development of SRLS is crucial. Individuals with a high level of self-compassion tend to show empathy and understanding, leading to positive relationships and effective leadership (35). On the contrary, individuals lacking self-compassion may struggle to empathize, which can hinder their ability to lead and take responsibility. The literature suggests that individuals with high self-compassion, along with leadership qualities, contribute to building trust and cooperation, which helps make communities more resilient (36). Leadership skills help individuals think solution-oriented during crises and guide others around them. These skills enable them to cope with stress and tackle challenges more effectively (37). Additionally, social responsibility enhances empathy and the sense of helping others, making it easier to deal with personal difficulties (36). Therefore, promoting self-compassion and developing SRLS can enhance resilience.

Our study results revealed that CTPSS are significant moderators that strengthen the relationship between self-compassion and resilience. Nursing students with higher levels of CTPSS exhibit greater resilience when demonstrating high levels of self-compassion. These findings suggest that while self-compassion plays a role in resilience, individuals with superior CTPSS may be even more resilient when adopting self-compassion practices. Supporting our findings, a study by Chen and Gan (38) also emphasized that CTPSS are fundamental components of adapting to new situations, and individuals who demonstrate resilience in challenging circumstances tend to possess higher levels of these skills. Similarly, a randomized controlled trial conducted by Şenocak and Demirkıran (39) reported that nursing students who received training to improve their problem-solving skills experienced an increase in resilience. This may be because CTPSS help individuals apply self-compassion strategies more effectively when coping with difficult situations, leading to a more efficient adaptation and coping process (40). Nursing students often experience high levels of stress due to academic requirements, clinical placements, and the need to balance personal and professional responsibilities (1). Therefore, CTPSS are crucial for nursing students to successfully manage academic demands and responsibilities (39). Teaching self-compassion techniques (5) alongside CTPSS (39) may help students manage stress and develop resilience. Individuals with strong CTPSS are more likely to navigate challenges effectively throughout their education and transition successfully into professional nursing roles.

Study Limitations

Our study faced several limitations. Firstly, as a cross-sectional design, it limits the ability to draw causal inferences, as the relationships between the variables were measured at a single point in time. Longitudinal studies could provide a clearer understanding of the causal pathways between 21st-century skills, self-compassion, and resilience over time. Secondly, while the sample was sufficiently large, it was drawn from nursing students in only one public and one foundation university, which may limit the generalizability of the findings to other student populations or academic disciplines. Thirdly, the study's descriptive nature may not fully capture the multidimensionality of the constructs of

21st-century skills, self-compassion, and resilience. Future qualitative or mixed-method research could offer a deeper exploration of these factors and their dynamic interplay. Despite these limitations, our study provides valuable insights into the relationships between 21st-century skills, self-compassion, and resilience among nursing students, and contributes to the literature on nursing education.

Conclusion

The results of this study highlight the strong correlation between nursing students' resilience and self-compassion. The positive correlation observed suggests that cultivating self-compassion could potentially enhance the resilience levels of individuals within this academic and professional context. This insight is particularly crucial in the demanding and often stressful environment that nursing students navigate. Moreover, the study highlights the role of MCSS as both mediators and moderators in the correlation between resilience and self-compassion. This implies that these skills influence the strength of the association between resilience and self-compassion and contribute to facilitating this relationship. In the context of professional nursing, these findings carry significant implications, as both self-compassion and resilience are critical for effective patient care, emotional regulation, and long-term career sustainability. This implies that interventions targeting the development of both self-compassion and these contemporary skills could offer a comprehensive approach to bolstering resilience among nursing students. Additionally, professional nursing practice requires the integration of 21st-century skills, such as teamwork, problem-solving, and adaptability, which are essential not only in clinical settings but also for managing the emotional and psychological challenges nurses face. Nursing practitioners can better manage the complicated nature of patient care, stress, and burnout by cultivating these competencies. The study highlights how crucial it is for nursing education programs to include self-compassion training and the development of multifaceted 21st-century skills. Equally important is the inclusion of these elements in continuous professional development for practicing nurses, as enhancing resilience and self-compassion throughout one's career can improve job satisfaction and patient outcomes. This strategy may enhance nursing students' resilience and general well-being, giving them the tools they need to successfully handle the difficulties of both their educational and professional lives. Additional studies and real-world initiatives in this field may yield insightful information for optimising nursing education, strengthening professional practice, and promoting the success of future healthcare professionals.

Ethics Committee Approval: This study was approved by the Başkent University's Ethics Board (approval no: E-62310886-605.99-239101, date: 07.11.2023).

Informed Consent: Each participant provided informed consent, affirming their voluntary participation and understanding of their rights throughout the study.

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Footnotes

Author Contributions: Concept - S.Y., C.A.T.; Design - S.Y., C.A.T.; Data Collection or Processing - S.Y., C.A.T.; Analysis or Interpretation - S.Y., C.A.T.; Literature Search - S.Y.; Writing - S.Y., C.A.T.

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ORIGINAL ARTICLE

The Relationship Between Mothers' Parenting Self-efficacy and Perception of Postpartum Social Support: A Descriptive Correlational Study

Annelerin Ebeveyn Öz-yeterliği ile Doğum Sonrası Sosyal Destek Algısı Arasında İlişki: Tanımlayıcı İlişkisel Çalışma

Elif Ertem[1], Songül Aktaş[2]

[1]Department of Nursing, Provincial Health Directorate, Trabzon, Turkey
[2]Department of Midwifery, Karadeniz Technical University Faculty of Health Sciences, Trabzon, Turkey

Abstract

Objective: This study aimed to examine the relationship between mothers' parenting self-efficacy and their perception of postpartum social support.

Method: The research was conducted using a cross-sectional design. The study was carried out with 604 mothers between 3 and 6 months postpartum. The data were collected online using the "maternal information form", the "parental self-efficacy scale (PSES)", and the "postpartum support questionnaire (PSQ)." There are two main dimensions of the PSQ, namely "importance of the need" and "perceived support", and four sub-dimensions.

Results: The total score of the PSES was found to be 35.20±10.4. Based on the cut-off point for the "importance of the need", the level of mothers' perception of the importance of the need for social support is as follows: 55% "very important", 12.4% "important", 32.6% "not important". A positive correlation was found between the mean score of the PSQ and the total score of the "importance of the need" main dimension, and all sub-dimension scores of the PSQ ($p<0.05$). The explanatory effect of the "importance of the need" dimension of the PSQ on the parental self-efficacy score was found to be 7.4% ($R=0.274$, R^2 adjusted=0.074, $p<0.001$).

Conclusion: A significant relationship was identified between parental self-efficacy and the perceived "importance of the need" for postnatal social support. Based on these findings, it is recommended that nurses and midwives routinely assess mothers for both parental self-efficacy and the need for postnatal social support.

Keywords: Mother, postpartum, parental self-efficacy, social support

Öz

Amaç: Çalışmanın amacı; annelerin ebeveynlik özyeterliği ile doğum sonrası sosyal destek algısı arasındaki ilişkinin incelenmesidir.

Yöntem: Tanımlayıcı tipte bir araştırmadır. Araştırma doğum sonrası 3 ile 6 ay arasında olan 604 anne ile gerçeklemiştir. Veriler; anne tanıtıcı bilgi formu, ebeveyn öz-yeterlik ölçeği (EÖYÖ) ve doğum sonrası destek ölçeği (DSDÖ) formları ile online toplanmıştır. DSDÖ'nin "ihtiyacın önemi" ve "alınan destek" olmak üzere iki ana boyutu ve 4 alt boyutu bulunmaktadır.

Bulgular: Annelerin EÖYÖ toplam puanı 35,20±10,4'tür. DSDÖ'nin ihtiyacın önemi boyutunun kesme noktasına göre annelerin sosyal desteğe "ihtiyacın önemini" algılama düzeyleri; %55 "çok önemli", %12,4 "önemli", %32,6 "önemsiz" şeklindedir. Annelerin EÖYÖ puan ortalaması ile; DSDÖ'nün "ihtiyacın önemi" ana boyutu toplam puanı ve tüm alt boyutları puan ortalaması arasında pozitif ilişki saptanmıştır. Annelerin DSDÖ "ihtiyacın önemi" ana boyutunun, EÖYÖ puanı üzerinde açıklayıcı etkisi %7,4 saptanmıştır ($R=0,274$, R2 adjusted=0,074, $p<0,001$).

Sonuç: Annelerin ebeveyn özyeterliği ile doğum sonrası sosyal destek "ihtiyacının önemi" arasında anlamlı ilişki saptanmıştır. Hemşire ve ebelerin anneleri; ebeveyn öz-yeterliği ve doğum sonrası sosyal destek yönünden rutin olarak taraması önerilmektedir.

Anahtar Kelimeler: Anne, doğum sonu, ebeveyn öz-yeterliği, sosyal destek

Corresponding Author:
Songül Aktaş, songulbora52@gmail.com

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Introduction

Becoming a parent is a lifelong journey that begins with the decision to conceive and continues through pregnancy, childbirth, and the postpartum period (1). Individuals who assume the primary caregiving role for an infant or child are considered parents. Parenthood is closely intertwined with an individual's beliefs and self-efficacy. Theorist Bandura defines self-efficacy as "an individual's belief in their capacity to execute behaviors necessary to produce specific performance attainments" (2). In the context of parenting, self-efficacy is a fundamental attribute that mothers should possess to assume their parenting role effectively (3).

Parental self-efficacy refers to "a parent's confidence in their ability to fulfill various responsibilities related to meeting the basic needs, caring for, and nurturing their baby" (2). The level of parental self-efficacy in mothers is influenced by multiple factors, including age, being an adolescent parent, receiving prenatal and postpartum care, the presence of neonatal malformations, the number and type of births, experiencing an unwanted pregnancy, the quality of the relationship with the spouse or partner, the socio-cultural context, obstetric factors, the mental health of the mother, and the perceived level of social support (4). Mothers with higher levels of parental self-efficacy have been found to have better postpartum mental health outcomes, as it acts as a protective factor (5,6). These mothers are more likely to view the challenges they face as manageable obstacles rather than threats and demonstrate autonomy in decision-making regarding infant care (7,8). Research indicates that mothers with a high perception of support and control during childbirth are more likely to interact with their babies earlier, initiate breastfeeding sooner, and establish maternal attachment more quickly (9). Therefore, increasing parental self-efficacy in the early postpartum period is vital for maternal and infant health, which can be achieved by enhancing social support from all healthcare professionals, particularly midwives, as well as from spouses and family members, creating a positive birth environment (10), and promoting breastfeeding motivation (11).

Postpartum social support plays a crucial role in reducing parental stress (12). Social support is defined as various forms of assistance, both material and emotional, provided to individuals experiencing stress or difficult situations, which play a role in societal and familial support systems and aid in socialization (13). This support can encompass financial aid, emotional support, information sharing, educational resources, and social comparison support. During the postpartum period, mothers require social support to navigate the physical and psychological changes they experience as well as to care for their newborn baby (4). Qualitative research has shown that first-time mothers particularly need social support in the early postpartum period to enhance their emotional well-being, access information, and boost their self-efficacy. These mothers also expect assistance from their social environment and healthcare professionals in this regard (14). Meeting the social support needs of postpartum women acts as a protective factor for both parental self-efficacy and postpartum mental health (5,6). Postpartum social support helps mitigate the impact of stressful events and enhances coping strategies, thereby safeguarding mental health (6). The spouse is recognized as one of the most significant sources of social support. In a study by Aydın et al. (5) involving 389 mothers within the first 7 days after birth, increased perception of spousal support was associated with reduced postpartum stress. Mothers who receive adequate postpartum social support are more likely to experience a smoother transition to motherhood, engage in positive mother-infant interaction, and achieve improved marital adjustment (15,16). Conversely, insufficient social support can lead to difficulties in problem-solving and an increase in parental stress, which in turn may decrease parental self-efficacy (17). Therefore, it is crucial for midwives and nurses involved in postpartum care to identify the individual and social support needs of mothers early on and take appropriate measures to promote maternal, newborn, family, and public health (18).

The current literature lacks sufficient studies specifically focusing on the parental self-efficacy of postpartum mothers (19,20). Additionally, previous literature reviews have not identified any studies exploring the correlation between parental self-efficacy and postpartum social support perception among low-risk mothers during the 3- to 6-month postpartum period. Hence, this study aims to fill this research gap by examining the association between mothers' parenting self-efficacy and their perception of postpartum social support. The findings from this study are expected to contribute to the existing body of literature, provide valuable insights for future research, and align with the World Health Organization's strategies to improve the quality of postpartum care and enhancing perinatal mental health.

The research questions include the following:

•What is the level of mothers' parenting self-efficacy during the postnatal period?

•To what extent do mothers perceive postnatal support as important?

•What is the level of mothers' perception of the postnatal support they receive?

•Is there a relationship between mothers' parenting self-efficacy and the perceived importance of the "need" dimension on the postnatal support scale?

Main Points

- The parental self-efficacy level of the mothers between 3 and 6 months after birth is close to average (according to the mean score on the scale).
- Four out of ten mothers perceive their level of social support as "high", whereas three out of ten mothers report experiencing no social support at all.
- Most mothers identify the need for social support as being "very important".
- This study revealed that there is a positive relationship between mothers' parental self-efficacy between 3 and 6 months after birth and the need for postnatal support. As the need for social support, including emotional, informational, and financial issues, increases in mothers, parental self-efficacy increases.

•Is there a relationship between mothers' parenting self-efficacy and the "received support" dimension on the postnatal support scale.

Material and Method

The population consisted of mothers living in Turkey during the period between 3 and 6 months after birth. The sample size of the study was determined on the OpenEpi Version 3.01 software by calculating proportions. In this study, the sample size was calculated as 567 subjects using the formula for sampling an unknown population, based on a prevalence of 50% and a confidence interval of 95%. To account for potential data loss or dropout during the study, an additional 10% of the calculated sample size was added. Therefore, the study was conducted with a total of 604 mothers to ensure an adequate sample size for analysis.

Inclusion Criteria

Maternal criteria:

- Accepting to participate in the study,
- Being 20 years of age or older,
- Being at least a primary school graduate,
- Speaking Turkish,
- Being in the period between the beginning of the 3rd month and the end of the 6th month postpartum,
- Not having a psychiatric illness requiring treatment,
- Having a live baby,
- Not having any disabilities.

Criteria for the baby:

- Being born in term (38-41 gestational weeks),
- Having a birth weight of 2500 g and above,
- Not having any congenital anomalies (such as heart, kidney, wolf mouth, or hare lip)

Exclusion Criteria

Maternal criteria:

- Having a history of multiple pregnancies before this birth,
- Having mental retardation,

Criteria for the baby:

- Being born prematurely (37th gestational week and before).

Data Collection

Initially, a researcher (E.E.) shared the research invitation link on her social media accounts, such as Facebook, Instagram, and WhatsApp. This invitation outlined key details, such as the name, purpose, sampling criteria, data collection methods of the study, and the researcher's contact information. To reach the sample in the study, the researcher sent a request to online groups about "pregnancy, motherhood, and breastfeeding" that were accessible on social media, requesting to join them, in addition to sharing the research invitation link on her personal social media accounts. She shared the link to the online survey, in the groups that responded positively to this request. In this study, data were collected from mothers living in seven different regions of Turkey.

Study data were collected using an online questionnaire created on Google Forms, between January 12, 2021, and January 21, 2022. The first page of the Google form included information about the research (such as the purpose of the study, sample group, and data collection methods) and a voluntary consent form to participate in the study. The data from the mothers who selected the option "I agree to participate in the study" were collected via this online questionnaire. Before initiating the data collection process, the inclusion criteria were presented to the mothers online. These criteria include being 20 years of age or older, being between 3 and 6 months postpartum, and having a healthy baby. Mothers who met these criteria were subsequently administered the following three forms online in sequence: the "maternal information form (MIF)", the "parental self-efficacy scale (PSES)" and the "postpartum support questionnaire (PSQ)".

Data Collection Tools

The MIF was a tool developed by the researchers in line with the literature (1,5,12). It consists of questions about the sociodemographic, obstetric, family, and perception of support of the mothers.

The PSES was developed by Kılıçaslan (21) in 2007 to determine the individual judgments of new parents about their competence in the parenting role; the PSES consists of 18 items and is measured on a five-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). Reverse scoring is used for certain items. The total score on the scale can range from 18 to 90, with a higher score indicating higher parental self-efficacy. In the study, Cronbach's alpha coefficient for the scale was found to be 0.894.

The PSQ was developed by Logsdon in 2004 to assess the needs of mothers for social support in the postpartum period. The validity-reliability study of the scale in the Turkish population was conducted by Ertürk (22) in 2007. The PSQ can be used in any postpartum period. It consists of 34 items and is measured on an eight-point Likert-type scale ranging from 0 (not important) to 7 (very important). It has two main dimensions: the "importance of the need for postpartum support and the perceived support for the need for postpartum support. The cut-off points for each main dimension vary. In the PSQ main dimension of importance of the need," the evaluation of postpartum support is as follows: "not important" for a total score of "130 and below,"

"important" for a score of "131-150", and "very important" for a score of "151 and above". On the PSQ's main dimension of "perceived support", a total score of "99 and below" is considered "no support", "100-134 is considered moderate support", and "135 and above" is considered "high support." In this study, the Cronbach's alpha value was 0.943 for the "importance of need" dimension and 0.924 for the "perceived support" dimension. An increase in the scale score indicates a higher level of the "importance of the need" and "perceived support".

The main dimensions of "importance of need" and "perceived support" consist of four sub-dimensions: material, emotional, informational, and comparison. The material support subdimension encompasses assistance related to free choices regarding nutrition, financial matters, hygiene, and women's duties. The emotional support sub-dimension involves encouragement, approval, feelings of being loved, and a sense of togetherness. The information support sub-dimension entails sharing relevant information, being informed about new developments, and receiving help in problem-solving. Lastly, the comparison subdimension involves comparing oneself with another woman who is in a similar postpartum situation.

Statistical Analysis

The statistical analysis of the study was carried out using the "Statistical Package for the Social Sciences" (SPSS) for Windows 25.0. While interpreting the results, a 95% confidence interval and a significance level of $p<0.05$ was used. The Kolmogorov-Smirnov test was used to determine whether the data showed a normal distribution. It was observed that the data were normally distributed. Number, percentage, mean, and standard deviation were used as descriptive statistical methods in the evaluation of the data. Pearson correlation analysis was used to examine the relationship between maternal self-efficacy and perceptions of postpartum social support. Regression analysis was used to examine the effect of social support on parental self-efficacy.

Ethical Consideration

Ethical approval was obtained from the Karadeniz Technical University Scientific Research Ethics Committee in Turkey (decision no: 23, date: 04.01.2021). An informed consent form was presented to all mothers who would be included in the study, via the Google Forms platform.

Results

As shown in Table 1, 40.1% of the mothers were graduates; almost all of them (99.3%) were married, 93.4% had a nuclear family, and almost all of them (97.8%) lived in the same house with their spouses. The spouses of 32.1% of the mothers had an associate degree, 80.3% of the spouses had not worked for the last 6 months, and the income perception of 80.1% of the spouses was moderate. The spouses of 93.2% of the mothers were employed. The mean age of the mothers was 30.97±4.78 years, and 32.8% of the working mothers returned to work between 13 to 16 weeks after birth. Approximately two-thirds of the mothers (70.9%) had a caesarean section as their last mode of birth. 67.1% of the mothers did not receive postpartum education from health professionals. The mean number of births was 1.60±0.70, the number of children was 1.61±0.70, and the time since the last birth was 4.80±1.14 months.

Table 2 shows that the PSES score of the mothers was 35.20±10.42. In this study, the total scores of the PSQ's main dimensions of "importance of the need" and "perceived support" were found to be 153.21±50.24 and 125.17±45.81, respectively. The mean scores of the sub-dimensions ranged from 21.26±9.66 to 46.83±15.69.

In the study, the mothers' perception levels of the "importance of the need" for social support were determined according to the main dimension cut-off point of the PSQ as shown in Figure 1, with 55% "very important," 12.4% "important," and 32.6% "not important."

As for the perception of social support among the mothers, 42.9% reported "high" and 31.3% "none", as shown in Figure 2.

As shown in Table 3, a positive correlation was found between the mean score of the PSES and the total score of the "importance of the need" main dimension and the mean score of all sub-dimensions (material, emotional, information, and comparison) of the PSQ ($p<0.05$) . A negative, low-level relationship was found between the "emotional support subdimension score" of the perceived support main dimension of the PSQ and parental self-efficacy ($p<0.05$).

In Table 4, in the multiple regression analysis, the explanatory effect of the "importance of the need" main dimension of the postpartum support scale on parental self-efficacy was found to be 7.4% ($R=0.274$, R^2 adjusted=0.074, F (1,602)=48.858; $p=0.000$). According to the results of the regression analysis, the regression equation predicting parental self-efficacy is as follows: parental self-efficacy =(0.057 x importance of the need) + (26.485).

Discussion

The average score on the PSES in this study was found to be 35.20±10.42. Given the minimum and maximum scores possible on the scale, the results indicate that the mothers in our study exhibit lower-than-average parental self-efficacy. This result aligns with similar findings from previous studies that utilized the same scale. However, it is important to note that, unlike our study, some studies have reported parental self-efficacy at both low and high levels (23-25). In studies utilizing the same scale, the PSES used in this study Kılıçaslan (21) reported a mean score of 27.4±7.3. Additionally, a Swiss-based study by Razurel et al. (23), which employed a different scale from the PSES used in this research, also found that mothers exhibited low parental self-efficacy. These discrepancies in findings may be attributed to various factors, such as the number of participants, the location and duration of the study, and the time elapsed since birth.

Table 1.
Distribution of Mothers' Socio-demographic and Obstetric Characteristics (n=604)

Characteristics				**n**	**%**
Mother's education level	Primary school			11	1.8
	Middle school			36	6.0
	High school			142	23.5
	Associate degree			121	20.0
	Undergraduate and postgraduate			294	48.7
Marital status	Single*			4	0.7
	Married			600	99.3
Family type	Nuclear family			564	93.4
	Extended family			34	5.6
	Broken family			6	1.0
Situation of mother and wife living in the same house	is alive			591	97.8
	not alive			13	2.2
Spouse education level	Primary school			37	6.1
	Middle school			70	11.6
	High school			166	27.5
	Associate degree			194	32.1
	Undergraduate and postgraduate			137	22.7
Mother's employment status (last 6 months)	Working			119	19.7
	Not working			485	80.3
Spouse's employment status	Working			563	93.2
	Not working			41	6.8
Mother's perception of income level	Low income			63	10.4
	Middle income			484	80.2
	High income			57	9.4
Postpartum return to work (employees only)	1-4 week			4	3.4
	5-8 week			20	16.8
	9-12 week			30	25.2
	13-16 week			40	32.8
	17-20 week			15	10.9
	21-24 week			13	10.9
Pattern of mother's last birth	Normal (vaginal) birth			176	29.1
	Cesarean delivery			428	70.9
Postpartum education status of mothers from health professionals	I did not take			405	67.1
	I bought			199	32.9
Continuous variables	**n**	**Minimum**	**Maximum**	**Mean**	**SD**
Age	604	20	45	30.97	4.78
Number of births	604	1	4	1.60	0.70
Number of children	604	1	4	1.61	0.70
Time elapsed since your current birth (months)	604	3	6	4.80	1.14

**=divorced, her husband died, SD=standard deviation*

Table 2.
Distribution of Mothers' Total and Sub-dimension Mean Scores from the Parental Self-efficacy and Postpartum Support Scale (n=604)

Scale and subscales	n	Minimum	Maximum	Mean	SD
Parental self-efficacy scale	604	18	59	35.20	10.42
The importance of PSQ's need core dimension					
Financial support sub-dimension	604	0	63	39.55	14.01
Emotional support sub-dimension	604	0	70	46.83	15.69
Information support sub-dimension	604	0	70	44.84	18.38
Comparison support sub-dimension	604	0	35	22.00	10.28
Need major dimension importance total score	604	14	238	153.21	50.24
Major dimension of support received in PSQ					
Financial support sub-dimension	604	0	63	26.78	13.77
Emotional support sub-dimension	604	0	70	41.10	16.11
Information support sub-dimension	604	0	70	36.03	17.54
Comparison sub-dimension	604	0	35	21.26	9.66
Total score of support main dimension received	604	1	238	125.17	45.81

SD=standard deviation, PSQ=postpartum support questionnaire

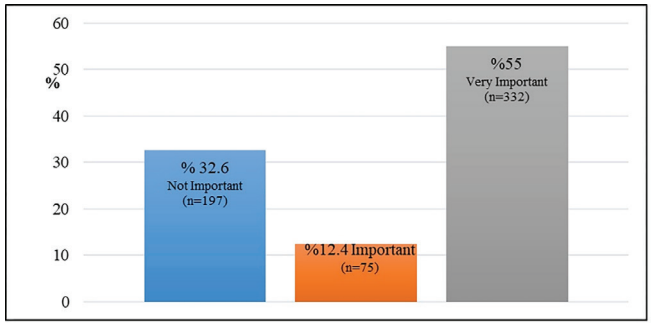

Figure 1.
The Percentage Distribution of Importance Levels Based on the Cut-off Point for the Main Dimension the "Importance of the Need" in the Postpartum Support Questionnaire (n=604)

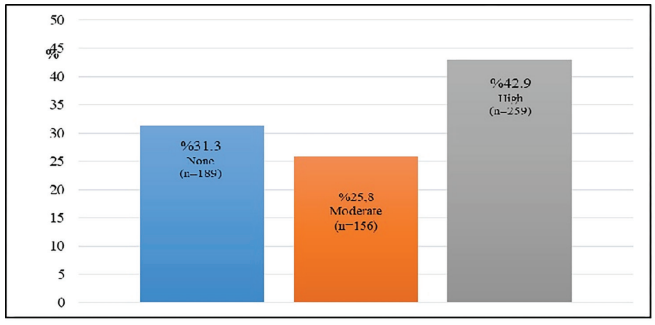

Figure 2.
The Percentage Distribution of Importance Levels Based on the Cut-off Point for the Main Dimension "Perceived Support" in the Postpartum Support Questionnaire (n=604)

Mothers' parental self-efficacy may be influenced by the level of social support they receive and perceive during the postpartum period. In this study, the mean score for the "importance of the need" dimension of the PSQ was 153.21±50.24, while the "support received" dimension had a mean score of 125.17±45.81. Based on the cut-off points of the PSQ, 42.9% of the mothers perceived the level of support received as "very much," 25.8% as "moderate", and 31.3% as "no support or minimal support." Regarding the need for support, 55% of mothers rated it as "very important", 12.4% as "important", and 32.6% as "not important". Similarly, studies by Semerci (26), Arıkan and Gözüyeşil (27), and Sevimli (28) which utilized the same scale, also reported that the majority of mothers rated their need for support at the "very important" level. Consistent with the literature, this study found that more than half of the mothers (55%) perceived their need for support as "very important". Aksakallı et al. (29), Türkoğlu et al. (30) and Ertürk (22) reported that the postpartum support needs of mothers were generally classified as "important" according to the scale cut-off points.

In this study, more than half of the mothers (55%) perceived the need for postpartum support as "very important". Similarly, in some studies, most postpartum mothers perceived the need for social support as "important" (10,31) The needs of mothers who perceive social support as important should be addressed. It is plausible that, considering the data for this study were collected during the COVID-19 pandemic, the importance of mothers' need for social support in areas such as infant care, immunization, breastfeeding, and protection against COVID-19 transmission may have been increased. This increased need for support may have been particularly significant for multiparous mothers, who often face

Table 3.
Examining the Relationship Between Mothers' Parental Self-efficacy Scale Mean Scores and Postpartum Support Scale's Main and Sub-dimension Mean Scores (n=604)*

Need importance main dimension of PSQ		**Parental self-efficacy level**
Financial support sub-dimension	r	0.275
	p	0.000
	n	604
Emotional support sub-dimension	r	0.265
	p	0.000
	n	604
Information support sub-dimension	r	0.207
	p	0.000
	n	604
Comparison sub-dimension	r	0.189
	p	0.000
	n	604
Total score of importance of need main dimension	r	0.274
	p	0.000
	n	604
Support main dimension of PSQ		
Financial support sub-dimension	r	0.045
	p	0.265
	n	604
Emotional support sub-dimension	r	-0.152
	p	0.000
	n	604
Information support sub-dimension	r	-0.075
	p	0.066
	n	604
Comparison sub-dimension	r	0.053
	p	0.191
	n	604
Total score of support main dimension received	r	-0.057
	p	0.161
	n	604

**=statistical analysis was done with Pearson correlation analysis, PSQ=postpartum support questionnaire*

Table 4.
The Effect of the Importance of Need Dimension of the Postpartum Support Scale on the Parental Self-efficacy of Mothers*

	Beta	**Standard error**	**Standart beta**	**t**	**p**	**95% confidence interval**	
Constant coefficient	26.485	1.311	-	20.198	0.000	23.910	29.061
Importance of need	0.057	0.008	0.274	-6.990	0.000	0.041	0.073

**=statistical evaluation was made with regression analysis*

additional responsibilities. Supporting this notion, a study conducted with mothers who gave birth vaginally found that more than half expressed concerns about their baby during the COVID-19 pandemic (12). Similarly, in this study, it is likely that concerns about the well-being of both their baby and themselves during the pandemic contributed to an increased demand for social support among mothers.

Otherwise, it may result in problems such as inadequacy in maternal role adaptation and parental self-efficacy due to failing to meet the needs of these mothers (12). A study by Aydın et al. (5) involving 384 postpartum mothers found that maternal stress levels were lower in mothers who perceived strong spousal support. It is crucial that individuals providing social support to mothers do not increase their stress and anxiety. In a study by Özkan et al. (32) with 222 mothers, as the level of social support increased, maternal anxiety also increased. This underscores the importance of a supportive and comforting approach from midwives, nurses, spouses, family, and friends who provide postnatal care and support.

The study findings revealed that approximately one in three mothers perceived the need for social support as "not important". It should also be considered that the presence of multiparous mothers in our study, along with their previous experience with childbirth and infant care, may have enhanced their parental self-efficacy. As a result, these mothers may have felt less reliant on social support, perceiving it as less important. Additionally, this observation may be attributed to the data collection taking place during the COVID-19 pandemic. Some mothers may have experienced fear related to virus transmission to themselves and their infants during the breastfeeding process. Additionally, the social isolation and quarantine measures implemented during the pandemic may have made it challenging for them to access physical social support. The literature highlights that some mothers have shown hesitancy in breastfeeding and have limited social interactions due to concerns about virus transmission to their infants amid the pandemic (12,33). It is worth noting that the pandemic has significantly amplified stress levels among postpartum parents. According to Xue et al. (17), the pandemic conditions had a detrimental impact on parental self-efficacy, leading to increased stress and anxiety among both mothers and fathers.

In the present study, it was observed that an increase in the perceived importance of social support during the postpartum period, (including material, emotional, informational, and comparison aspects) corresponded to higher levels of parental self-efficacy. This finding is consistent with the results of the study, which indicated that the "importance of the need" dimension of the PSQ influenced breastfeeding self-efficacy by boosting it 7.4% among the mothers. Additionally, Schobinger et al. (14) conducted a qualitative study revealing that first-time mothers sought social support in the early postpartum period to enhance their emotional wellbeing, access information, and boost their self-efficacy, and expected substantial assistance from their social circle and healthcare professionals in this regard. Therefore, the present study suggests that fulfilling the expectations of mothers who perceive social support as crucial may contribute to increased parental self-efficacy. Leahy-Warren et al. (34) discovered that adequate social support had a positive impact on first-time mothers' parental self-efficacy and overall motherhood experience. Similarly, Rhoad-Drogalis et al. (35) demonstrated that favorable relationships with the environment were instrumental in increasing social support, thereby enhancing parenting self-efficacy. However, it is important to consider the quantity (high, low, and none) and quality (meeting needs and expectations) of the received and perceived social support, as these factors significantly influence maternal self-efficacy.

Among the various forms of social support, spousal support holds particular significance for mothers. Literature highlights that postpartum spousal support plays a vital role in improving perinatal mental health. A study conducted with 389 mothers within the first 7 days after giving birth revealed that increased spousal support corresponded to decreased postpartum stress (5). Decreased postpartum stress, in turn, reduces parenting stress and contributes to an increase in parental self-efficacy. Additionally, it is reported that postpartum training programs provided to mothers enhance their coping skills, offer emotional support, alleviate stress and anxiety, and augment parental self-efficacy (23,36).

This study revealed that parental self-efficacy increased when the "emotional support" aspect of the perceived social support dimension of the PSQ decreased. This finding suggests that some mothers, drawing from their previous motherhood experiences and their psychological resources, may derive parenting self-efficacy and reduce their reliance on external factors. A study by Cin and Bingöl (37), conducted with 302 postpartum mothers, reported that higher levels of perceived social support were associated with lower rates of traumatic stress and depression. This finding highlights the significant positive impact of social support on the mental and psychosocial health of postpartum mothers (37). Moreover, considering the context of the pandemic during which this study took place, characterized by increased social restrictions and reduced social support resources, some mothers in the study may have developed a reduced need for emotional support through spiritual and psychological growth, including post-traumatic growth. However, it is crucial to acknowledge that sustaining postpartum care through home visits by midwives can play a significant role in enhancing the quality of postpartum care, increasing parenting self-efficacy, and safeguarding and promoting mental health. Considering that the level of support and control provided to mothers during birth can increase the

transition to the maternal role and parental self-efficacy (9), individualized midwifery care should be provided during the intrapartum period.

Study Limitations

The study has some limitations. The data were collected during the second wave of the COVID-19 pandemic in Türkiye. The study was conducted only with mothers between the first 3-6 months after birth.

Conclusion

There is a positive relationship between mothers' parental self-efficacy and postpartum social support, indicating the importance of addressing this need. To increase the parental self-efficacy of mothers, the quality of postpartum care should be enhanced. Mothers' perceptions of postpartum social support should be routinely screened. In mothers who perceive postpartum social support as important, it should be monitored whether this need is met, and social support should be increased with a multidisciplinary approach in the presence of risk. Emotional and informational support should be provided to parents by opening parent preparation classes during pregnancy and the postpartum period. In shocking and traumatic events such as pandemics and war, social support and parenting self-efficacy should be increased by providing counseling to mothers through telehealth and e-health applications.

Ethics Committee Approval: Ethical approval was obtained from the Karadeniz Technical University Scientific Research Ethics Committee in Turkey (decision no: 23, date: 04.01.2021).

Informed Consent: An informed consent form was presented to all mothers who would be included in the study, via the Google Forms platform.

Footnotes

Acknowledgments

This study is a master's thesis. We would like to thank all the mothers who participated in our study. In this study, online consent was obtained from participants.

Footnotes

Author Contributions: Surgical and Medical Practices –E.E., S.A.; Concept - E.E., S.A.; Design - E.E., S.A.; Data Collection and/or Processing - E.E., S.A.; Analysis and/or Interpretation - E.E., S.A.; Literature Review - E.E., S.A.; Writing - E.E., S.A.

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ORIGINAL ARTICLE

Theoretical Knowledge and Practices of Nurses in Amman on Wound Care: A Descriptive Study

Amman'daki Hemşirelerin Yara Bakımı Konusundaki Teorik Bilgi ve Uygulamaları: Tanımlayıcı Bir Çalışma

Mohammed Sameer Abu Msallam[1], Ümran Dal Yılmaz[2]

[1]Clinic of Wound Care, Dallah Hospital, Al Khobar, Saudi Arabia
[2]Department of Surgical Nursing, Near East University Faculty of Nursing, Nicosia, TRNC Mersin 10, Turkey

Abstract

Objective: The aim of the study is to obtain information about nurses' knowledge and practices regarding wound care.

Method: The study was implemented as descriptive. It was implemented in the surgical, medical and emergency and operation room departments of two hospitals in Amman. The number of nurses who volunteered to participate in the study was 260. Data were collected using a questionnaire prepared by the researcher regarding knowledge and practice on wound care.

Results: Mean age and standard deviation of the participants were (28.06±4.92) and 54.2% were females. Sixty-four point nine percent of the nurses answered questions about wound healing correctly, 19.7% answered incorrectly, and 15.4% answered "I don't know". Regarding to the analysis findings question 1, 2 and 3 have the lowest percentage of the correct answers and question 3 have the lowest percentage of the unknown answers. When we asked about the practices related to wound healing, it was determined that 81.2% of the nurses did the practices correctly, 8.4% did them incorrectly, and 10.4% sometimes did them correctly. According to the analysis findings, the 2nd and 5th ptactices have the lowest percentage of correct answers.

Conclusion: Nurses had high mean knowledge and practice scores in all items. "The percentage of correct answers regarding nurses" wound care practices was found to be higher than their percentage of theoretical knowledge regarding wound care. Nurses' correct answer scores regarding wound care practices were found to be higher than their theoretical knowledge scores regarding wound care. A knowledge gap was detected between theory and practice. Nurses may unknowingly perform correct practices, so a connection should be established between theory and practice regarding wound care with scientific evidence. Studies and in-service training are needed to transform nurses' current knowledge regarding wound care into clinical practice.

Keywords: Wound management, wound care, nursing care, nurse, knowledge and practice

Öz

Amaç: Çalışmanın amacı hemşirelerin yara bakımına ilişkin bilgi ve uygulamaları hakkında bilgi edinmektir.

Yöntem: Çalışma tanımlayıcı olarak planlandı. Amman'daki iki hastanenin cerrahi, dahiliye, acil ve ameliyathane servislerinde uygulandı. Çalışmaya 260 hemşire gönüllü olarak katıldı. Veriler bilgi ve uygulama ile ilgili hazırlanan soru formu kullanılarak toplandı.

Bulgular: Katılımcıların yaş ortalaması (28,06±4,92) olup, %54,2'si kadındır. Hemşirelerin %64,9'u yara iyileşmesi ile ilgili soruları doğru yanıtlarken, %19,7'si yanlış yanıtlamış ve %15,4'ü ise "bilmiyorum" yanıtını vermiştir. Analiz bulgularına göre doğru cevap yüzdesi en düşük olan sorular 1, 2 ve 3. sorulardır ve bilinmeyen cevap yüzdesi en düşük olan soru ise 3. sorudur. Yara iyileşmesi ile ilgili uygulamalar sorulduğunda ise hemşirelerin %81,2'sinin uygulamaları doğru yaptığı, %8,4'ünün yanlış yaptığı ve %10,4'ünün ise bazen doğru yaptığı belirlenmiştir. Analiz bulgularına göre doğru uygulama cevap yüzdesi en düşük olan 2. ve 5. uygulamadır.

Sonuç: Hemşireler tüm sorulara ilişkin yüksek bilgi ve uygulama puanlarına sahipti. Hemşirelerin yara bakımı uygulamalarına ilişkin doğru cevap yüzdesinin, yara bakımına ilişkin teorik bilgi yüzdesinden yüksek olduğu bulunmuştur. Teori ve uygulama arasında bir bilgi boşluğu tespit edildi. Hemşireler bilmeden doğru uygulamalar gerçekleştirebilmektedir. Bu nedenle yara bakımına ilişkin teori ve uygulama arasında bilimsel kanıtlarla bir bağlantı kurulmalıdır. Hemşirelerin yara bakımına ilişkin mevcut bilgilerini klinik uygulamaya dönüştürmek için çalışmalara ve hizmet içi eğitime ihtiyaç vardır.

Anahtar Kelimeler: Yara yönetimi, yara bakımı, hemşirelik bakımı, hemşire, bilgi ve uygulama

Corresponding Author:
Ümran Dal Yılmaz, umran.dal@neu.edu.tr

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Introduction

A wound is a damage to the body's anatomical structure and functions and can be acute or chronic. Having a wound creates a significant burden on the health and social system due to its negative impact on the patient's quality of life and economic costs. Healing of the patient's existing wound depends on nurses' knowledge of wound care, correct practices and awareness of care methods (1,2). Wound care performed by nurses plays an important role in wound healing, patient care and satisfaction. Nurses who have accurate and sufficient knowledge about wound care can perform comprehensive and detailed patient and wound assessments. It is important to recognize wound-related complications at an early stage (1-3).

Early intervention will prevent the wound from getting worse and will accelerate its healing. This can only be done by nurses who are knowledgeable about wound management (3-5). Wound care nurses can accurately assess the wound and determine the best wound care options. They follow, update and apply best practices in wound care to prevent wound complications. Scientific nursing evidence should be used in wound treatment and prevention to ensure patient safety. Nurses should be encouraged for innovative and scientific practices. Nurses' expertise in wound care reduces surgical wound complications, re-admissions, length of hospital stay, and costs, while also improving patients' quality of life and satisfaction (5-8).

Nurses' evaluation of the patient's general health status and holistic care during wound care positively affects wound healing. Nurses with sufficient evidence-based wound care knowledge help in the decision-making of patients and family about wound care strategies and enhance optimal care options (9).

In the study conducted by Rızalar et al. (10) that the wound care education the nurses currently have is inadequate. Clean wounds are commonly washed with saline solution and covered with dry dressing, pain control during dressing is insufficient, and modern dressings are rarely used (10). Aslan and Kants's study (11), pressure ulcer knowledge and prevention behaviors of nurses working in intensive care units (ICUs) were found to be moderate.

Nurses' knowledge and experience in wound care is a way to increase competence and confidence in practice. This study was conducted to reveal the wound care knowledge and practices of nurses in Amman. There is no study that includes theoretical knowledge and practice of nurses in Amman regarding wound care. Therefore, this study was conducted to determine the knowledge and practice of nurses. The next goal of the researcher is to plan training if there is a lack of knowledge and practice regarding wound care.

Main Points

- Nurses have important roles and responsibilities in wound care.
- Wound care plays a crucial role in patient care conducted by nurses.
- There is a need to assess and improve on management practices of nurses regarding wound knowledge and practice.

Aim: The aim of the study was to determine the theoretical knowledge and practices of nurses in Amman regarding wound care. The research sought answers to the following questions:

1. What are nurses' theoretical knowledge of wound care?

2. What are nurses' wound care practices?

3. Is there a difference between nurses' theoretical knowledge and practices of wound care?

4. Are nurses' demographic characteristics and knowledge and practices of wound care different?

Material and Method

Study Design

This study was designed as a descriptive study.

Study Setting

The study was conducted in two hospitals in Amman, Jordan. The capacity of Jabal Al-Zaytoon Hospital is 200 beds and the capacity of Islamic Hospital is 270 beds. Jabal Al-Zaytoon Hospital has surgical, medical, and emergency services. The daily number of patients is approximately over 300. Islamic Private Hospital has surgical, medical, and emergency department. The daily number of patients is approximately over 400 patients. Wound care practices in the hospitals where the study was conducted are performed by physicians and nurses, and there is no special wound care nurse.

Sample Selection

This study was conducted in the surgical and internal medicine clinics and emergency services. The number of nursing staff working in Jabal Al-Zaytoon Hospital; total 132 (surgical and medical clinics 40, emergency room 30, ICU 40, operation room 22). Number of nurses working at Islamic Private Hospital; total 146. (25 emergency room, surgical and medical clinics 44, ICU 37, operation room 40). The total number of nurses working in both hospitals was 278, and 260 volunteer nurses who met the inclusion criteria constituted the sample of the study. 18 nurses did not volunteer to participate in the study. 93.5% of the nurses were reached.

The Inclusion Criteria

Registered nurses who have worked full-time in hospital for at least one year, have at least a bachelor's degree and can read English.

Study Tools

Data were collected using a questionnaire form prepared by the researcher (3-5,8,9). Opinions of four surgical nursing faculty members were obtained for the prepared questions.

No method was used to obtain expert opinions. Questions were asked whether they were appropriate. The questions were found appropriate and no changes were made other than question stems and spelling corrections in line with the suggestions. Then, a pilot application was conducted with 10 nurses. No changes were made after the pilot application. The questionnaire consists of three sections.

1. The first section about demographic characteristics of nurses constitute 5 questions (gender, age, marital status, working experience, and ward).

2. The second part asks about wound care knowledge. It consists of 12 questions and has three options.

3. The third part asks about wound care practices knowledge. It consists of 12 questions and has three options.

Questions regarding nurses' knowledge and practice regarding wound care were evaluated with their responses to the options "yes/correct", "no/wrong" and "I don't know" and their percentages were calculated. It was determined whether the participants in the sample knew the information questions about wound care and whether they applied the practices correctly.

Data Collection

The data for the study was collected by the researcher between August 1-20, 2020. The questionnaire was administered face to face during the nurses' break times. It took approximately 15 minutes.

Ethical Aspect

Ethical approval (Institutional Review Board) was obtained from the Islamic Hospital in Amman, Jordan (approval number: 15/2020/2241, date: 13.08.2020). Permission was also obtained from the hospitals managements. Informed consent was obtained from the nurses who participated in the study.

Statistical Analysis

Statistical Package for Social Sciences (SPSS) software version 21.0 was used (SPSS, version 21.0, Chicago, IL, USA). Descriptive statistics such as frequencies and percentages were used for variables, and Pearson's chi-square test was used to determine differences. When statistics were significant, the selected significance level was $p<0.05$.

A correlation test was performed to determine relationship between nurses knowledge and practice, a positive moderate correlation found that when the total knowledge is high that will affect positively on nursing practice; p-value of total knowledge and practice of nurses is (0.001) which mean that there are significances correlation were found between nurses knowledge and practice.

Results

The mean and standard deviation (SD) of age were (28.06±4.92). 54.2% of the nurses were female. 26.9% of the nurses were working in the ICU, 31.0% in medical, and 41.2% in surgery. 49.2% of nurses had more than three years of experience.

According to Table 1, 64.9% of the nurses answered the questions correctly. 15.4% stated that they did not know. Regarding to the analysis findings question 1, 2 and 3 have the lowest percentage of the correct answers and question 3 have the lowest percentage of the unknown answers.

According to Table 2, it was determined that 81.2% of the nurses performed wound care practices correctly. The p-value was analysed by using chi-square tests for the answers to find if there any significant difference between correct and wrong answers for the participant. Regarding to the analysis findings qquestion 2, 5 and 11 have the lowest percentage of the correct answers.

A positive moderately significant correlation was found between nurses' knowledge and practices regarding wound care. The mean and SD of total nurses knowledge were as (17.61±3.94), and the mean and SD of total nurses practice were as (15.49±2.80). A correlation test was performed to determine relationship between nurses knowledge and practice, a positive moderate correlation found that when the total knowledge is high that will affect positively on nursing practice. P-value of total knowledge and practice of nurses is ($p<0.001$) which mean that there are significances correlation were found between nurses knowledge and practice.

Differences between descriptive characteristics-based on knowledge and practice of nurses regarding wound care were tested by using Student t-test and one-way analysis of variance test formats. No statistically significant differences were found between the knowledge and practice of nurses based on gender, ($t=0.653$; $p=0.515$) for knowledge, and ($t=0.019$; $p=0.985$) for practice of nurses.

Statistically, no significant difference was found between the knowledge and practices of nurses according to their gender. A significant difference was found between the nurses' working years and their knowledge and practices regarding wound care ($p<0.001$). It was found that those with 2-3 years of nursing experience had higher knowledge scores. The knowledge level of intensive care nurses was higher depending on the department in which the nurses worked. The practices of the nurses were similar depending on the department in which they worked.

Table 1.
Nurses' Knowledge Regarding Wound Care (n=260)

Questions	Yes/correct		No/wrong		I do not know		p-value*
	n	%	n	%	n	%	0.014
Q1: Is it appropriate to use povidone in cleaning chronic wounds? (No)	207	79.6	50	19.2	3	1.2	
Q2: In granulated wounds with a mild to moderate exudate, a hydrocolloid dressing is a good choice as it maintains the granulation tissue and aids in epithelialization (Yes).	124	47.7	35	13.5	101	38.8	0.001
Q3: Do good bacteria inhibit wound healing in chronic wounds? (No)	124	47.7	33	12.7	103	38.5	0.001
Q4: Wound assessment and care requires a holistic approach (Yes).	191	73.5	14	5.4	55	21.2	0.001
Q5: Is moist dressing appropriate for chronic wound treatment? (Yes)	170	65.4	14	5.4	76	29.2	0.001
Q6: Localized infection is often characterized by the classical signs and symptoms of inflammation (Yes).	176	67.7	39	15.0	45	17.3	0.001
Q7Are topical enzymes suitable for removing necrotic tissue? (Yes)	194	74.6	14	5.4	52	20.0	0.001
Q8: Pain and discharge from the wound are signs of surgical wound infection (Yes).	248	95.4	12	4.6	0	0.0	0.194
Q9: The condition of the wound affects the wound healing process (Yes).	257	98.8	3	1.2	0	0.0	0.372
Q10: Prolonged hospitalization delays wound healing (Yes).	165	63.5	76	29.2	19	7.3	0.002
Q11: Should assessment of wound pain be done only by the clinician? (No)	52	20.0	183	70.4	25	9.6	0.001
Q12: I received adequate training in wound care (Yes).	232	89.2	23	8.8	5	1.9	0.023

The distribution of answers about knowledge		
Correct	**Wrong**	**I don't know**
64.9%	19.7%	15.4%

**=the p-value was analysed by using chi-square tests*

Discussion

Wound care management is an important skill in nursing practice and is one of the indicators of the quality of patient care. Evidence-based theoretical knowledge and practices are very important in wound care management and ensuring the quality of care (12,13). Nurses who know the wound healing process correctly can best manage wound monitoring, wound care, and appropriate discharge education. Nursing knowledge and skills must be continuously developed to improve the quality of health care and patient satisfaction (9-13). In our study, 64.9% of the nurses answered theoretical questions about wound care correctly, while 15.4% stated that they did not know the answer (Table 1). This result suggests that nurses' theoretical knowledge about wound care is at a moderate level. Nurses need to improve their theoretical knowledge about wound care. In some studies, it was observed that nurses' knowledge and practices regarding wound care were at a moderate level (10,14).

In the our study, only 19.2% of the nurses answered the question about the use of povidone in cleaning chronic wounds correctly. According to this result, it wasth ought that the nurses had a lack of knowledge about chronic wound cleaning solutions and needed to improve it. Additionally, 47.7% of the nurses gave incorrect answers regarding good bacteria in chronic wounds. Ingranulated wounds with a mild to moderate exudate, a hydrocolloid dressing is a good choice as it maintains the granulation tissue and aids in epithelialization. However, 38.8% of the nurses who participated in the study stated that they did not know this. Studies have shown that although the theoretical knowledge of nurses is insufficient in some cases, their practice is better (3,9,10,14). Nurses with sufficient evidence-based wound care knowledge help in the decision-making of patients and family about wound care strategies and enhance optimal care options. Sari et al. (15) surveyed 235 participants in an Indonesian city and revealed considerable knowledge deficiencies about wound care.

Nurses should be able to evaluate the patient holistically during wound care. It is extremely important to assess and rehabilitate the patient's physical condition, keep

Table 2.
Nurses' Practices Regarding Wound Care (n=260)

Questions	Yes		No		Sometimes		p-value*
	n	%	n	%	n	%	0.009
Q1: I use gloves to change sterile dressings when performing wound care (Yes).	243	93.5	14	5.4	3	1.2	
Q2: I assess the skin during my daily wound assessment (Yes).	145	47.7	107	41.2	8	3.1	0.001
Q3: I definitely use aseptic technique during wound dressing (Yes).	251	96.5	6	2.3	3	1.2	0.142
Q4: I use standards (protocols, guidelines, etc.) regarding wound care (Yes).	219	84.2	19	7.3	22	8.5	0.001
Q5: Do I recommend that the patient take a shower with antimicrobial agent before surgery? (Yes)	101	38.8	78	30.0	81	31.2	0.004
Q6: I use sterile solution for wound cleaning (Yes).	256	98.5	0	0.0	4	1.5	0.242
Q7: We implement a policy on wound assessment (Yes).	236	90.8	3	1.2	21	8.1	0.001
Q8: I can check and evaluate the wound site (Yes).	255	98.1	0	0.0	5	1.9	0.154
Q9: I use special products (such as beds) to prevent pressure sores (Yes).	235	90.4	3	1.2	22	8.5	0.487
Q10: I feel confident to make recommendations to my team about the covers for wounds? (Yes)	182	70.0	12	4.6	66	25.4	0.001
Q11: I provide information about appropriate wound dressings for my patients (Yes).	179	68.8	15	5.8	66	25.4	0.001
Q12: Nurses in my hospital use sterile gloves during chronic wound dressing changes (Yes)	234	90.0	3	1.2	23	8.8	0.001

The distribution of answers about practice		
Correct practice	**No practice**	**Sometimes**
81.2%	8.4%	10.4%

**=the p-value was analysed by using chi-square tests*

the wound moist, use appropriate dressings and keep the wound temperature constant. The nurse should assess the wound daily for infection. To do this, nurse monitors the patient's blood counts, serositis, and hematoma. They should regularly measure the size of the wound and be able to observe and intervene in wound infection. The nurse who provides wound care is expected to have all this information (8,16,17).

Ferreira et al. (3) concluded in their study to evaluate nurses' knowledge and practices on wound care that nurses' knowledge levels on some issues related to wound care were inadequate. As a result of the study, it was stated that there was a shortage of nurses specialized in wound care, insufficient work experience and lack of training in woundcare (3). However, having nurses specialized in wound care will increase the quality of care. Wound, Ostomy and Continence Nurses Association, it has been confirmed that being a wound care specialist is necessary and important for wound management and the care of surgical wounds, reducing the incidence of complications and increasing the adequacy of wound care (2).

In the study by Heerschap et al. (18) participants frequently discussed the benefits of a wound care specialist on the wound-management team to assist in the decision-making process. The wound specialist was discussed as a beneficial resource for whenever wound complications arise or staff are uncertain how to proceed with care (18).

It is very important that the nurse providing wound care does the application correctly. In our study, 81.2% of the nurses stated that they performed the practices correctly, but only 10.4% stated that they sometimes performed the practices correctly. The majority of the nurses participating in the study stated that they used sterile gloves, used sterile solution to clean the wound, and always checked and evaluated the condition of the wound area. Findings in this study also showed that 96.5% of the participants had practised aseptic technique in wound dressing (Table 2). Similarly, in the study by Christiana and Salawu (7), an score of the practice of surgical nurses in the experimental group on aseptic technique was reported as 92.9%. Aseptic technique plays an important role in wound care and in the management of surgical cases within the hospital, including operating rooms. In their study observing thepractices of

nurses regarding postoperative wound care, Mwakanyamale et al. (19) stated that good wound care practices were implemented, dry sterile dressing was applied and antiseptic solution was used for dressing. Moran and Byrne (20) reported in their study that 7% of the nurses used Betadine solution to clean the wound and less than 10% used normal saline solution to clean the wound. Betadine is ideal form in or wounds, cuts, abrasions and injuries. It is an antiseptic that kills or slows the growth of microorganisms that cause infection. It is often used for skin antisepsis before invasive procedures, but is not recommended for wound washing and should not be used. The prospective study showed nano silver gel is safe and effective in wound management and gives better efficacy and faster response as compared to traditional betadine dressing (21).

Surgical site infections are wound infections that occur after surgical procedures. Bathing or showering with an antiseptic skin wash before surgery is a well-accepted procedure to reduce skin bacteria. Reducing skin microflora may reduce the incidence of surgical site infections.

Only 38% of the nurses stated that they recommended their patients to take a shower with an antimicrobial agent before surgery, while 30.0% stated that they did not recommend it.

Pre-operative showering with antiseptic agents is a well-accepted procedure for reducing skin microflora. In the study conducted by Okgün Alcan et al. (22), a small number of nurses stated that patients were routinely given a shower/bath before surgery in the institution they worked in. The high rate of nurses who did not give a shower/bath before surgery and who did not know the practices of their institutions on the subject reveals the need for education on the subject and the need to conduct studies to increase the awareness of nurses (22).

Nurse managers should observe and continuously evaluate the practices of nurses. At the same time, nurses should receive regular training in wound management and wound assessment. Only in this way can improvements be made (4,23).

Yao et al. (17) stated that the quality of wound care is of critical importance for rapid, painless, and complication-free healing of surgical wounds. Postoperative wound care in surgical clinics is one of the important elements of nursing interventions.

The nurse's important responsibilities in wound management include mechanical cleaning, irrigation, and dressing of the wound, and records for wound follow-up. The wound care nurse is responsible for following new developments in wound care and staying current on wound care concepts and products. Taking care of wounds is a dynamic, complex process and requires specific knowledge of the nursing team, comprising professionals who will develop this care both in prevention and in the specific treatment (4,6,24).

The findings obtained in our study showed that there is a positive moderate correlation that will positively affect nursing practice when total knowledge is high (Table 3).

When we looked at theoretical knowledge and practices in our study, we also saw that the rate of nurses doing the practice scorrectly was higher than their theoretical knowledge. This made us think that nurses did some practices correctly without basing them on theoretical knowledge. We can say that there is a knowledge gap. This gap is between wound care knowledge and practice. Therefore, nurses need to be trained on wound care. The aim is to establish connections between theoretical and practical and scientific evidence on wound care (1).

In our study, no statistically significant difference was found between the knowledge and practices of nurses according to gender. According to work experience of nurses, statistically significant differences were found between knowledge and practice. It was determined that nurses with 2-3 years of experience had higher theoretical knowledge (Table 4). Studies have found that knowledge scores are significantly affected by nurses' characteristics. As age and working years increase, nurses' knowledge and correct practices increase (20,24). There were nosignificant differences in the practices of nurses according to the clinics they worked in. However, it was determined that intensive care nurses had a higher level of knowledge (Table 4). Studies have shown that intensive care nurses' knowledge levels regarding preventing pressure ulcers are sufficient or moderate, and their attitude levels increase as age and professional experience increase.

The role of nurses has become progressively important in wound care. Poor quality wound care can negatively impact patients, caregivers, nurses, and healthcare costs. Some studies revealed that nurses who cared for patients with wound care demonstrated slightly insufficient knowledge and a positive attitude, faced significant wound care

Table 3.
Relationship Between Nurses' Knowledge and Practices Regarding Wound Care

Descriptive statistics correlations		**Total knowledge**	**Total practice**
Total knowledge	r*	1	0.427*
	p		0.001
	n	260	260

**=correlation is significant at the 0.01 level (2-tailed), r=Pearson correlation*

Table 4.
Nurses' Knowledge and Practices Regarding Wound Care According to Their Descriptive Characteristics (n=260)

Descriptive characteristics (n=260)	Total knowledge of nurses		Total practice of nurses	
Gender Male (n=119) Female (n=141)	t=0.653 p=0.515	Mean ± SD	t=0.019 p=0.985	Mean ± SD
		(17.78±3.94) (17.67±4.33)		(15.49±2.64) (15.48±2.94)
Experience year 0-1 (n=32) 1-2 (n=30) 2-3 (n=70) >3 years (n=128)	f=35.178 p=0.001	(19.63±3.37) (16.33±2.72) (20.50±3.84) (16.05±3.77)	f=12.607 p=0.001	(16.91±3.32) (16.47±2.94) (16.26±3.03) (14.49±2.07)
Departments Surgical and medical (n=83) ICU (n=70) Emergency and operating room (n=107)	f=17.251 p=0.001	(16.04±3.68) (19.80±3.45) (17.66±4.34)	f=2.863 p=0.059	(14.90±2.60) (15.90±2.81) (15.68±2.89)

SD=standard deviation, ICU=intensive care unit, t=independent t test, f=one-way analysis of variance

barriers, and were moderately confident toward wound care. The studies results are important for use by researchers, educators, managers, and policy makers in improving wound care quality. Continuous and integrated wound care education programs should be developed based on the nurses' wound care knowledge, attitude, and confidence to provide high-quality wound care for patients. Further development of educational programs and frequent measurement of these parameters can lead to a significant improvement in the quality of care provided (9,11,14,25).

Study Limitations

The responses given by the participants reflect only the nurses working in that hospital and it was based on a questionnaire and there was no possibility of observation.

Conclusion

Nurses had high mean knowledge and practice scores in all items. Wound care knowledge accounted for more than 50% and in practice wound care accounted for more than 80%.

Nurses' knowledge and practices percentages were high in all items. Wound care knowledge was more than 50% and their correct practices of wound care was more than 80%. The percentage of nurses' correct practices of wound care was higher than their percentage of theoretical knowledge about wound care. A knowledge gap was detected between theory and practice. Nurses may unknowingly perform correct practices, so a connection should be established between theory and practice regarding wound care with scientific evidence. It is recommended that training on wound care in academic and in-service training programs for nurses should be provided, protocols should be developed and their use should be ensured.

Ethics Committee Approval: Ethical approval (Institutional Review Board) was obtained from the Islamic Hospital in Amman, Jordan (approval number: 15/2020/2241, date: 13.08.2020). Permission was also obtained from the hospitals managements.

Informed Consent: Informed consent was obtained from the nurses who participated in the study.

Footnotes

Author Contributions: Surgical and Medical Practices - M.S.A.M., Ü.D.Y.; Concept - M.S.A.M., Ü.D.Y.; Design - M.S.A.M., Ü.D.Y.; Data Collection and/or Processing - M.S.A.M., Ü.D.Y.; Analysis and/or Interpretation - M.S.A.M., Ü.D.Y.; Literature Review - M.S.A.M., Ü.D.Y.; Writing - M.S.A.M., Ü.D.Y.

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ORIGINAL ARTICLE

Effect of Z Technique Application on Patient Comfort, Pain and Adverse Events in Allergic Rhinitis Patients Receiving Subcutaneous Allergen Immunotherapy: A Randomized Controlled Study

Z Tekniği Uygulamasının Subkutan Alerjen İmmünoterapisi Alan Alerjik Rinit Hastalarında Konfor, Ağrı ve Yan Etkiler Üzerindeki Etkisi: Randomize Kontrollü Bir Çalışma

Gönül Gökçay[1], Zeynep Genç Akgün[2], Ayşe Çevirme[3], Aylin Meşe Tunç[3], Nida Efetürk[4], Özge Ertürk[5], Seda Göger[6], Elif Seda Uğurlu[2], Hülya İncirkuş Küçük[2]

[1]Department of Public Health Nursing, Kafkas University Faculty of Health Sciences, Kars, Turkey
[2]Department of Nursing, Sakarya University Institute of Health Sciences, Sakarya, Turkey
[3]Department of Public Health Nursing, Sakarya University Faculty of Health Sciences, Sakarya, Turkey
[4]Department of Nursing, Kocaeli Health and Technology University Faculty of Health Sciences, Kocaeli, Turkey
[5]Department of Gerontology, Balıkesir University Faculty of Health Sciences, Balıkesir, Turkey
[6]Department of Health Care Services, Sakarya University Vocational School of Health Services, Sakarya, Turkey

Abstract

Objective: This study aims to determine the effect of the Z technique on patient comfort, pain, and adverse events in allergic rhinitis patients receiving subcutaneous allergen immunotherapy (SCIT).

Method: This study employed a randomized controlled trial with a pre-test and post-test design. A total of 60 participants were randomly assigned to either the experimental group (Z technique, n=30) or the control group (conventional SCIT method, n=30). Data were collected using the personal information form, the visual analog scale for pain, the general well-being scale, and the adverse events form (swelling, redness, medication leakage). Data were analyzed using IBM SPSS Statistics, with Pearson's chi-square test, independent t-test, dependent t-test, and McNemar's test applied for statistical evaluation. Trial Registration: ClinicalTrials.gov. Identifier: NCT05657262.

Results: SCIT using the Z technique significantly improved quality of life, reduced pain levels, and minimized adverse events after one hour and one dayat 1 hour and 1 day ($p<0.05$).

Conclusion: The Z technique enhanced patient comfort, decreased pain perception, and reduced adverse events, making it a promising alternative for SCIT administration.

Keywords: Immunotherapy, Z technique, comfort, pain, adverse effect

Öz

Amaç: Bu çalışma, Z tekniğinin subkutan alerjen immünoterapisi (SCIT) alan alerjik rinit hastalarında hasta konforu, ağrı ve yan etkiler üzerindeki etkisini belirlemeyi amaçlamaktadır.

Yöntem: Bu çalışma, ön-test-son test tasarımına sahip randomize kontrollü bir çalışmadır. Toplam 60 katılımcı rastgele olarak deney grubu (Z tekniği, n=30) veya kontrol grubuna (geleneksel SCIT yöntemi, n=30) atanmıştır. Veriler, kişisel bilgi formu, görsel analog ağrı skalası, genel iyilik hali ölçeği ve advers etkiler formu (şişlik, kızarıklık, ilaç sızıntısı) kullanılarak toplanmıştır. Verilerin analizi IBM SPSS Statistics 23 programı ile yapılmış olup, istatistiksel değerlendirmede ki-kare testi (Pearson), bağımsız t-testi, bağımlı t-testi ve McNemar testi kullanılmıştır. Çalışma kaydı: ClinicalTrials.gov. Kimliği: NCT05657262.

Corresponding Author:
Nida Efetürk, nida.efeturk@ogr.sakarya.edu.tr

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Bulgular: Z tekniği ile uygulanan SCIT'nin, yaşam kalitesini önemli ölçüde artırdığı, ağrı düzeylerini azalttığı ve yan etkileri bir saat ve bir gün sonra minimize ettiği bulunmuştur (p<0,05).

Sonuç: Z tekniği, hasta konforunu artıran, ağrı algısını azaltan ve yan etkileri en aza indiren bir yöntem olarak SCIT uygulamasında umut verici bir alternatif sunmaktadır.

Anahtar Kelimeler: İmmünoterapi, Z tekniği, konfor, ağrı, advers etki

Introduction

The term "allergy" denotes a reaction that takes placeoccurs when the immune system manifest hypersensitivity to environmental allergens (1).

Allergen-specific immunglobulin E (IgE) production is linked to the increase in allergic disorders, which are thought to be an immune system response immune responses driven by genetic background and environmental factors (1,2). Scientific studies have shown that familial factors are effective in the development of allergy, and the genetic and environmental factors that affect it include family history of allergy, cesarean delivery, male gender, being the first child, maternal smoking, early antibiotic use, nutrition, obesity, exposure to allergens in the home environment, IgE>100 u/mL before the age of 6, living in damp and moldy environments, and being born into a household with a history of allergies. According to a study conducted in Turkey, those who have a history of allergies, smoke, live in slums, or have damp homes are more likely to develop allergic rhinitis (AR) (3,4).

Atopic dermatitis, food allergies, allergic asthma (AA) and AR are the first in a specific order ofin the sequence of allergic diseases that cause economic burdens by lowering quality of life, increasing costs, causing morale-damaging side effects from treatment, and increasing absenteeism from work and school among both children and adults. The bodys immune system reacts to foreign particles including dust, mites, animal dander, pollen, and mold by producing an IgE mediated reaction, which causes AR, an inflammatory condition brought on by environmental allergens, to develop in the nasal mucosa. According to studies conducted in our nation, the Marmara Region had the highest frequency of AR-36.1%-and (36.1%), whereas the Southeastern Anatolia Region had the lowest-21.0% (21.0%) (5,6).

Food allergy, which is thought to afflictestimated to affect 8% of children and 11% of adults in the US, is another cause of allergic reactions. Foods such as eggs, wheat, fish and crustaceans, milk, and soybeans frequently cause allergies (7). With increases in hospitalizations compared with previous years and a rise in incidence worldwide, food allergies have emerged as one of the major public health issues (8).

Since the turn of the 20th century, allergy patients with allergies have been treated with allergen immunotherapy (AIT), which involves eliminating environmental factors that cause allergies from daily life (3). The only treatment for AR and/or AA with long-term success is AIT administered as subcutaneous (SC) immunotherapy AIT (9).

AIT can cure immunological hyperactivity in allergic individuals either by minimizing exposure to allergens or, if oral anti-allergen drugs are ineffective, by regulated exposure to allergens. Even after the course of therapy is complete, it usually reduces sensitivity to allergens, permanently relieves allergy symptoms, and improves quality of life, even after the course of therapy is complete (10,11). SC immunotherapy has been shown to reduce not only allergy symptoms but also the need for medication (12). Additionally, SC immunotherapy improves quality of life by reducing the incidence of asthma resulting from bronchial hypersensitivity, as well as related issues, such as sleep disturbances, chronic fatigue, and attention deficits (13,14).

During subcutaneous allergen immunotherapy (SCIT), natural allergens in aqueous form are typically injected into the upper arm during, SCIT typically. It has been applied in clinical settings for more than a century (11). Although SC injection is one of the most commonly used drug administration techniques used by nurses, pain, hematomas, and drug leakage from the injection site are common complications of SC injection. The injection technique employed by paying attention to the angle of the needlethat involves attention to needle angle is crucial to avoid complications and back leaking of the medicationmedication backflow (15). Post-injection pain is a stressful and unpleasant experience with psychological, physiological, and emotional consequences for individuals. Local reactions manifest as itching, redness, and swelling at the injection site (16). Reactions at the injection site may range in extent from a few millimeters in diameter to

Main Points

- The Z technique is known for its ability to significantly reduce pain and medication leakage during intramuscular injections, and these benefits may also apply to subcutaneous (SC) injections, such as subcutaneous allergen immunotherapy (SCIT) for patients with allergic rhinitis.
- Studies have shown that applying the Z technique during SCIT can improve patient comfort and reduce adverse symptoms such as pain, swelling, and redness at the injection site.
- The Z technique reduces pain and adverse effects by creating a zigzag path that effectively seals the injection site, minimizing medication leakage, irritation, and tissue trauma.
- The effectiveness of the Z technique improving patient outcomes in SCIT and potentially other SC injection treatments is supported by evidence. The application of this technique can be particularly beneficial in clinical settings wherein which patient comfort is a priority and minimizing injection-related adverse events is essential.

swelling and erythema covering most of the patient's upper arm. Redness and swelling may progressively increase and persist for more than 24 hours (17). Kim et al. (16) reported that pain and swelling following immunotherapy could lead to skin infections and, in rare cases, result in the discontinuation of treatment. Adherence is essential to maximize the benefits of SCIT (18). Pain and other forms of discomfort at the injection site adversely affect treatment adherence and patient comfort (19,20).

Nurses should consider and implement interventions that reduce injection-related pain, aiming for better patient acceptance and a less traumatic experience while maximizing comfort to improve patient acceptance, minimize trauma, and maximize comfort (19). To prevent hematoma formation and reduce local pain intensity during injection, various nursing measures, such as selecting the appropriate injection site, angle, needle size, and injection duration, are necessary (21-23). In addition, various SC injection techniques are used. For instance, disposable plastic devices that temporarily block peripheral nerve endings prevent pain perception during injection (19,24). Similarly, the Z technique, in which the tissue is displaced by 2-3 cm laterally before injection at a 90-degree anglea 90-degree injection, results in a zigzag-shaped needle tract upon tissue release, preventing drug leakage and local irritation, thereby reducing pain (25,26).

A study in children receiving immunotherapy found no significant difference in pain reduction among devices used to block pain during injections, cold applications, and analgesic sprays (27). Implementing the Z technique for SCIT injections may offer a practical and effective alternative to disposable pain-blocking devices, cold application, and analgesic sprays.

It was shown that applying the Z technique was a key method to reduce pain in a study that compared it with waiting 10 seconds after a SC insulin injection (28). Another study comparing the effectiveness of the Z technique and the airlock method in reducing discomfort during intramuscular (IM) injections found that the Z technique was superior to the airlock method. In another investigation, IM injections using the air-lock technique resulted in less pain and less medication leakage than injections using the conventional or Z techniques (29).

The literature review revealed that although there are a few studies contrasting the Z method with standard injection in various sample groups (30,31), there is no patient-based randomized controlled trial on allergies. The purpose of this study is to ascertain how the Z method affects AR patients receiving SCIT treatments in the allergy clinic's waiting room's the comfort, pain, and unwelcome symptoms (pain, swelling, and redness) of patients with AR receiving SCIT treatments in the allergy clinic waiting room.

Material and Method

Type of Study

The study employed a randomized, controlled, pretest-posttest experimental design with experimental and control groups.

Variables of the Research

Dependent variables: General comfort scale (GCS), visual analog pain scale (VAS), adverse symptom follow-up questionnaires.

Independent variables: Immunotherapy application to be performed by applying Z technique.

Control variables: Demographic data such as age, education level, and income status constitute control variables.

Objective of the Study

The primary objective of this study was to use a randomized controlled experimental method to assess the impact of the Z technique on comfort, discomfort, and unpleasant symptoms in AR patientsamong patients with AR receiving SCIT, using a randomized controlled experimental method.

Hypotheses of the Study

- H0: Treatment with Z technique for AR patients receiving SCIT has no effect on comfort levels, pain and adverse event.

- H1: Treatment with Z technique has an effect on the comfort levels of AR patients receiving SCIT.

- H2: Treatment with Z technique for AR patients receiving SCIT has an effect on pain levels.

- H3: Treatment with Z technique for AR patients receiving SCIT has an effect on adverse event.

Research Population and Sample

The population of our research study population consists of 104 individuals with AR who received SCIT at University of Health Sciences Türkiye, Kocaeli Derince Training and Research Hospital during the last year. Prior to data collection, the sample size for the intended study was determined using the "G*Power-3.1.9.2" tool at with an 80% confidence level. To ascertain whether the Z method treatment affected comfort, pain, and unpleasant symptoms in allergy patients receiving immunotherapy, an independent samples t-test was planned. Accordingly, the minimum sample size was determined to be 60 participants in total, 30 experimental and 30 control (11), based on the means and standard deviations of the experimental (6.93, 4.62) and control (10.03, 3.69) groups of the amount of leakage in the application area of the studyfor the amount of leakage in the application area of the study in the experimental (6.93, 4.62) and control (10.03, 3.69) groups, using the Z technique. The effect size was 0.741, the alpha standard error value was 0.05,

and the power (1-err prob) was 0.80. Increasing the sample size is crucial for reducing bias due to losses, and data loss of up to 15% is acceptable (15). As a result, the trial enrolled 70 participants, 35 in each of the experimental and control groups receiving immunotherapy, which was 15% more than originally planned. The study sample consists of patients who received immunotherapy at a maintenance dose of 1 mL. Five patients from each group who were originally intended to participate in the study could not participate because immunotherapy vaccinations were not readily available due to coronavirus disease-2019 at the start of the study. As a result, the study was completed with 30 experimental and 30 control groups.

Data Collection Tools

The data-collection tools to be used in the study are the personal information form, the VAS, the adverse symptoms form, and the GCS.

Personal information form: For the experimental and control groups, the form includes questions developed based on the literature regarding age, height, weight, marital status, educational level, parenthood, place of residence, employment status, income level, and duration of immunotherapy (10,28).

VAS: It is a scale numbered from 1 to 10 and is used to measure the severity of pain that occurs after SCIT. The highest pain intensity is rated as 10 and the lowest as 1 (28).

GCS: In 1990, the Comfort Theory was developed by Katharina Kolcaba. The validity and reliability of the Turkish version of the GCS were verified by Çıtlık Sarıtaş et al. (32).The scale has three sub-dimensions. The refreshment, relaxation, and overcoming problems sub-dimensions consist of 9, 9, and 10 items, respectively. The lowest score of 1 indicates a low comfort level, and the highest score of 6 indicates a high comfort level. Cronbach's alpha for the Turkish version of the GCS- (GCS-SF) was 0.82 (32).

Adverse symptoms follow-up form: A form based on the literature was developed by the researchers to assess potential swelling, redness, and leakage after SCIT at 1 hour and 1 day. This form was refined based on the expert opinions of five specialists (33,34).

Research Implementation Stages

The GCS-SF and personal information form, which took approximately 10 minutes to complete, were administered to patients who presented to the allergy and immunology outpatient clinic and met the inclusion criteria. The Novo Helisen Depot medication was then properly prepared by the researcher for each patient in both the experimental and control groups. A 1 mL insulin syringe was filled with the medication, and the needle was then replaced. The tissue was lifted using the thumb and index finger of the left hand and displaced to the right during the Z technique drug administration in the experimental group. The drug was injected slowly after the injector needle penetrated the tissue. Upon completion of the procedure, the injector was removed first, and the tissue was subsequently released, allowing the tissue to heal (29). The study was conducted by nurses with bachelor's degrees in nursing and knowledge of the Z technique for administering injections. The standard method of delayed vaccine administration was used in the control group. The standard method of delayed vaccine administration was used for the control group. In this technique, the needle is inserted into the tissue at a 90-degree angle in a single motion, ensuring complete needle insertion. The medication is injected over 1-2 seconds, and the needle is then swiftly withdrawn (35). In both the experimental and control groups, the amount of medication that seeped out when sterile blotting paper was applied to the injection site was measured with a millimeter ruler and recorded on the data recording form (29). After that, as a post-test, the researcher requested responses from the experimental and control groups on the VAS, the adverse symptoms follow-up form, and the GCS-SF regarding any pain, swelling, or redness that might appear an hour after each injection and a day after each injection. The study data were collected when patients arrived for immunotherapy administration; patients were followed up the next day, and the data collection process was completed within four months. Figure 1 displays the study flow diagram.

Randomization and Blinding

Simple randomization was used in the study to assign individuals to groups. The researcher used the Random Integer Generator under the "Numbers" subheading at https://www.random.org/web to create distinct columns for two groups containing numbers between 1 and 70. To determine which columns would be assigned to the experimental and control groups, a specialist physician at a hospital unrelated to the study determined which column would be included in which group by selecting the groups written in two envelopes by lottery used a lottery, drawing from two envelopes labeled with the groups (29). Then, after they were numbered 1 to 70 and their groups were written on them, the opaque envelopes were sealed. For the participant numbering process (to determine to which number and group each individual was assigned), after the inclusion criteria had been evaluated and approval had been obtained from the participants, the envelope for each individual was selected by a specialist physician at a hospital unrelated to the study. The selection, distribution, homogeneity assessment, and inspection of the groups were supported by a qualified statistician who was independent of the study.

The research is organized in accordance with the CONSORT 2010 Checklist to promote candor, honesty, and transparency (36). The "simple randomization method" was used to divide the participants into the groups. Participants were blinded to group assignment. The experiment was conducted using a programmed scenario generated by the automated, computer-based randomization, and participants were assigned to one of the intervention arms in a concealed manner. Numbers were assigned

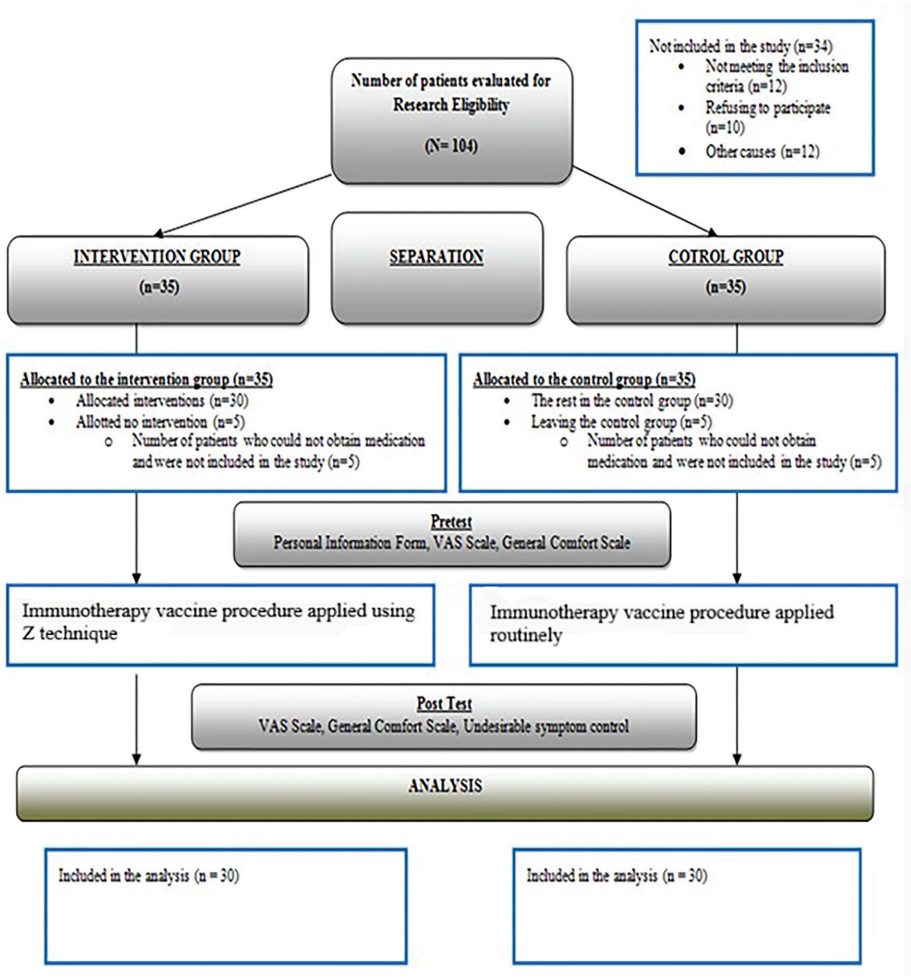

Figure 1.
Study Flow Chart
VAS=visual analog scale

and processed using the random.org application by a researcher who was not involved in the study. From the time the participants launched the computer program until the start of the intervention, the researcher was blinded to all conditions. Additionally, participants were unaware of whether they were assigned to the experimental or control group. Additionally, randomization and interventions were concealed from the researchers who coded and analyzed the data. Double-blinding of investigators and patients receiving immunotherapy does not appear possible. However, masking was used whenever feasible, with applications ranging from test administration and scoring to initial participant placement. The specialist physician who conducted the drawing of envelopes was blinded to the study, as were the researcher who administered the questionnaire, the researcher who conducted the random assignment, the researcher who performed the statistical analysis, and the researcher who completed the statistical evaluation. The coded response sheets were added to the analysis program only after the study was complete (37).

Inclusion and Exclusion Criteria

Inclusion criteria: Receiving SCIT treatment at Kocaeli Derince Training and Research Hospital, aged between 18 and 65 years, and volunteering to participate in the study.

Exclusion criteria: Not volunteering to participate in the study, moving to another city for any reason, SCIT treatment period has ended, the patient is in the dose escalation period during the SCIT treatment process, the patient is receiving SCIT treatment outside the mite.

Ethical Dimension of the Study

Permission to apply to the ethics committee for the study was obtained from the institutions. The Ethics Committee of the Faculty of Health Sciences of the Kafkas University granted approval for Non-Interventional Clinical Research (approval number: 81829502.903/94, date: 30.09.2022). Effective randomization was performed, and informed consent was obtained from the subjects participating in the study. The principles of the Declaration of Helsinki will be

adhered to in the study. Approvals for the use of the scales in the study were obtained via e-mail.

Evaluation of the Data

The data were analyzed using IBM SPSS Statistics, 23-V version 23. For categorical variables, counts and percentages were used to summarize the frequency distribution, and means and standard deviations were used as the descriptive statistics for numerical variables. The results were evaluated at a significance level of 0.05. A paired t-test was used to examine change over time by comparing pre-test and post-test scores in the experimental and control groups; the chi-square (Pearson) was used to assess the similarity of the descriptive characteristics of the experimental and control groups; and the McNemar test was used to analyze categorical variables measured at different time points.

Results

Below are the results of a study that looked atexamined the effects of the Z technique on comfort, pain, and adverse symptoms patients with AR receiving SCIT.

According to the study, participants' descriptive characteristics, such as age, height, weight, marital status, parental status, educational attainment, place of residence, employment status and income status, and duration of immunotherapy, did not differ significantly between the experimental and control groups (Table 1, p>0.05).

Although the GCS relief, overcoming problems sub-dimensions, and total pre-test mean scores pre-test mean scores for the GCS relief and overcoming problems sub-dimensions and the total did not differ significantly between the study groups (p>0.05), the GCS relief pre-test mean score in the experimental group was significantly

Table 1.
Distribution of Patients in the Intervention and Control Groups According to Descriptive Characteristics (n=60)

Descriptive characteristics	Experiment group		Control group		Test	p
	n	%	n	%		
Age (average ± SD)	38.13±11.84		37.97±10.43		0.058[1]	0.954
Height (average ± SD)	165.77±19.24		160.97±28.59		0.763[1]	0.449
Weight (average ± SD)	73.07±12.82		67.70±13.86		1.557[1]	0.125
Marital status						
Married	17	44.7	21	55.3	1.148[2]	0.284
Single	13	59.1	9	40.9		
Having children						
Yes	12	40	18	60	2.400[2]	0.121
No	18	60	12	40		
Educational status						
Primary school and below	8	57.1	6	42.9	1.554[2]	0.460
Secondary education	5	35.7	9	64.3		
Undergraduate and above	17	53.1	15	46.9		
Place of residence						
Province	7	43.8	9	56.3	0.341[2]	0.559
District	23	52.3	21	47.7		
Occupation						
Employed	19	54.3	16	45.7	0.617[2]	0.432
Unemployed	11	44	14	56		
Income status						
Good	8	57.1	6	42.9	0.373[2]	0.542
Average	22	47.8	24	52.2		
Duration of immunotherapy treatment						
Less than 1 year	8	53.3	7	46.7	0.089[2]	0.766
More than 1 year	22	48.9	23	51.1		

[1]=independent sample t-test, [2]=chi-square test (Pearson chi-square), SD=standard deviation

higher than that in the control group (p<0.05). Additionally, the experimental group outperformed the control group in mean posttest scores for the GCS sub-dimensions of refreshment and relaxation, as well as in the overall GCS posttest scores; the difference was statistically significant (p<0.05). When change over time was assessed, there was no statistically significant difference between the pretest and posttest total mean scores for the control group's GCS sub-dimensions (p>0.05). It was determined that the intervention was successful in raising people's comfort levels (p<0.05) since the experimental group's mean scores for the GCS relief sub-dimension and overall scores were higher after than before the application (Table 2).

At 1 hour and 1 day after the application, the control group's mean VAS score was greater than that of the experimental group, and this difference was statistically significant (p<0.05). No appreciable difference was observed in mean VAS scores between the experimental and control groups at 1 hour and 1 day (p>0.05) when change over time was assessed (Table 3).

Table 4 compares the unfavorable findings at the application site at 1 hour and 1 day after SCIT between the intervention and control groups. There was a statistically significant difference in pain between the experimental and control groups at 1 hour and 1 day after SCIT treatment (p<0.05). It was found that the experimental group experienced less pain at 1 hour and 1 day.

Another outcome of the study was a significant difference in redness between the experimental and control groups at

Table 2.
Distribution of the Mean Scores of the General Comfort Scale Sub-dimensions and Total Scores of the Patients in the Experimental and Control Groups According to the Pre-test Post-test Measurements (n=60)

	Experiment	**Control**	**Difference between groups (t^1/p)**	**p**
General comfort scale total				
Pre-test	4.64±0.50	4.41±0.38	2.005	0.050
Final test	4.77±0.46	4.42±0.35	3.329	**0.002***
Pre-test-final test difference (t^2/p)	-3.486/**0.002***	-0.352/0.728		
Relief				
Pre-test	4.74±0.66	4.57±0.52	1.107	0.273
Final test	5.04±0.59	4.57±0.51	3.251	**0.002***
Pre-test-final test difference (t^2/p)	-4.872/**0.000***	-0.102/0.919		
Relief				
Pre-test	4.57±0.60	4.07±0.34	3.976	**0.000***
Final test	4.62±0.60	4.14±0.0.36	3.794	**0.000***
Pre-test-final test difference (t^2/p)	-0.879/0.387	-1.557/0.130		
Overcoming problems				
Pre-test	4.62±0.68	4.58±0.47	0.288	0.775
Final test	4.67±0.64	4.54±0.47	0.930	0.356
Pre-test-final test difference (t^2/p)	-1.373/0.177	1.508/0.142		

*^{1}=independent sample t-test, ^{2}=dependent sample t-test, *=p<0.05*

Table 3.
Distribution of the Mean VAS Scale Scores of the Patients in the Experimental and Control Groups 1 Hour and 1 Day After the Application (n=60)

	Experiment	**Control**	**Difference between groups (t^1/p)**	**p**
VAS scale total				
1 hour later	1.03±1.54	3.46±3.02	-3.925	**0.000***
1 day later	0.90±1.94	3.90±3.26	-4.331	**0.000***
Pre-test-final-test difference (t^2/p)	0.354/0.726	-0.971/0.340		

*^{1}=independent sample t-test, ^{2}=dependent sample t-test, *=p<0,05, VAS=visual analog scale*

Table 4.
Distribution of Undesirable Findings in the Intervention and Control Group Patients 1 Hour and 1 Day After Immunotherapy Treatment (n=60)

After immunotherapy administration		Experiment		Control		Chi-square	p[1]
		n	%	n	%		
Is there pain after 1 hour?	Yes	9	30.0	18	60.0	5.455	**0.020***
	No	21	70.0	12	40.0		
Is there pain after 1 day?	Yes	4	13.3	18	60.0	14.067	**0.000***
	No	26	86.7	12	40.0		
	p[2]	0.227		1.000			
Is there redness after 1 hour?	Yes	4	13.3	13	43.3	6.648	**0.010***
	No	26	86.7	17	56.7		
Is there redness after 1 day?	Yes	2	6.7	8	26.7	4.32	**0.038***
	No	28	93.3	22	73.3		
	p[2]	0.625		0.063			
Is there swelling after 1 hour?	Yes	9	30.0	18	60.0	5.455	**0.020***
	No	21	70.0	12	40.0		
Is there swelling after 1 day?	Yes	3	10.0	15	50.0	11.429	**0.001***
	No	27	90.0	15	50.0		
	p[2]	0.070		0.012*			
Is there any leakage during medication administration?	Yes	12	40.0	26	86.7	12.129	**0.001***
	No	18	60.0	4	13.3		
How many millimeters is the leakage?	Less than 5 mm	9	56.3	7	43.8	5.938	**0.012***
	More than 5 mm	3	13.6	19	86.4		

*[1]=chi-square test, [2]=McNEmar test, *=p<0.05*

1 hour and 1 day after SCIT treatment (p<0.05). Redness was reduced in the experimental group at both 1 hour and 1 day. A significant difference (p<0.05) was observed between the experimental and control groups when swelling was assessed at 1 hour and 1 day after SCIT treatment. At 1 hour and 1 day, it was observed that the experimental group showed less redness. Drug leakage during SCIT administration was significantly lower in the experimental group (p=0.001), with 40.0% experiencing leakage compared with 86.7% in the control group. Among those with leakage, 56.3% of the experimental group had leakage less than 5 mm, whereas 86.4% of the control group had leakage greater than 5 mm (p<0.05).

Discussion

The findings of the study, which examined how Z technique treatment affected AR patients receiving SCIT in terms of comfort, discomfort, unpleasant symptoms, and adverse events, were discussed in light of the literature.

Induction of clinical tolerance can be achieved with SCIT when administered for at least three years. This effective treatment strategy induces long-term clinical tolerance to the sensitizing allergen (38). The only treatment that modifies the pathophysiology of IgE-mediated allergic disorders is AIT. According to studies (39,40), it has been shown to be effective in improving symptom control and reducing medication use in patients with allergic rhinoconjunctivitis and/or asthma when used in conjunction with appropriate pharmacological therapy for at least 3 years. The various types of causative allergens and their efficacy and safety profiles currently determine the route of administration (40). IM and SC injections are two of the parenteral medication administration procedures frequently used by nurses; they induce pain, pain management is a significant component of the care that nurses provide (15,41,42). Drug administration using a proper injection technique will help patients experience less discomfort and avoid unintended effects (43). In our study, the use of the Z technique was found to reduce adverse effects (pain, swelling, redness,

and leakage) following the intervention. The effects of modifying the injection technique on redness, swelling, and leakage were also measured. The findings indicated that leakage was lower in the experimental group than in the control group. However, this technique does not completely eliminate leakage. 40% of individuals who had IM injections in one research said they were "very painful". Drug leakage is another common issue with IM injections that may hinder the delivery of the full dose and delay the anticipated therapeutic outcome (15). The application of the Z technique was shown to be effective in reducing pain during the administration of IM injections, according to a study evaluating the impact of the Z-route technique (44). According to relevant literature reviews, the Z technique is frequently recommended for nurses administering IM injections; however, no findings regarding comfort, pain, or adverse effects of injections using the Z technique in SC drug applications were identified (45). Slow administration of the drug to reduce complications in IM drug administration (46,47), application of the double needle technique (48,49), distraction, touch, airlock (50,51), applying pressure to the injection site, etc. (52,53), are recommended. However, few scientific studies use the Z technique to reduce pain and drug leakage (15). One hour and one day after the application, the control group's mean VAS score was greater than the experimental group's, and this difference was statistically significant ($p<0.05$). The results of a study by Uzelli Yılmaz et al. (22) that examined the effects of the Z technique on pain and drug leakage during IM administration of the non-steroidal anti-inflammatory drug diclofenac revealed that drug leakage decreased when diclofenac sodium was administered intramuscularly using the Z technique, but pain intensity did not decrease significantly. According to our study's findings, the application of immunotherapy resulted in leakage of medication in 33 (55%) of the patientspatients (55%), and those treated with the Z method reported decreased pain (15). The differences in findings reported in the literature may be attributed to factors such as anatomical structure (thickness of muscle and skin tissue) and the active ingredient used in the treatment. The mean pain score for the standard IM technique was 3.75±2.03, whereas the mean pain score for the Z technique was 3.30±2.00, according to the results of an experimental study conducted by Alaşar and Çevik (29) to examine the effect of various IM injection techniques on pain and drug leakage. As a result, using the Z method following an IM injection reduces pain perception. The application of the Z technique substantially reduced pain severity during IM injection, according to the results of a randomized controlled trial conducted to evaluate the effect of the Z technique (54). According to the results of our study, the experimental group experienced less pain and greater comfort than the control group. This suggests that using the Z technique to administer drugs is an efficient way to lessen pain and increase comfort, and at this point, it is consistent with the results of related studies. The results of a study investigating the impact of skin stretching, pressure, rapid muscle relaxation, and the Z technique on reducing IM injection pain revealed that the Z technique application score was 1.68±1.20 and statistically significant, while the mean pain score for rapid muscle relaxation was 1.68±1.20 (41). The findings of this study suggest that the Z technique can be replaced by the pressure and quick muscle relaxation method to reduce IM injection pain. In this context, evidence shows that numerous strategies reduce injection pain (48,55,56) and that some approaches may be more effective than the Z technique at reducing injection pain when relevant research findings are compared with our findings (29). In this context, it is advised that additional scientific research be carried out, the pertinent literature be updated, and the scientific evidence gathered be applied.

The patient undergoes a painful procedure when receiving SC drugs, which affects his or her comfort. Comfort is described as the ease of daily living, and the literature typically discusses the need for comfort within the context of pain management (57,58). The provision and maintenance of patient comfort are among the key areas of interest and expertise for nurses. This study demonstrated that the Z method intervention improved overall comfort ($p<0.05$). No findings regarding the effects on comfort of Z method injections in SC drug administration were reported in the literature reviews relevant to the research, but there was evidence of comfort-improving effects of nursing practices (59). When the effectiveness in improving comfort was examined in randomized controlled trials with various sample groups, it was found that nursing interventions such as music, massage, acupressure and reiki, reflexology, oral carbohydrate solution, and education increased comfort, similar to our study (53,59). Nursing interventions have a favorable impact on comfort, as indicated by comparisons between the results of relevant studies and our findings.

Study Limitations

The limitations of the study include its being conducted solely in the Allergy and Immunology Clinic of a public training and research hospital, restricting the generalizability of the findings beyond the individuals who participated in the study. Additionally, difficulties in reaching participants for repeated measurements using data collection tools necessitated ongoing efforts to maintain communication.

Study Strengths

The strengths of the study include its randomized controlled experimental design, its novelty as the first known study conducted in immunotherapy patients, and the support for its findings through repeated measurements. Furthermore, the study not only assessed adverse effects but also examined the impact on pain and comfort.

Conclusion

In this paper, a randomized controlled experimental method was used to examine the effects of the Z technique on comfort, discomfort, and unpleasant symptoms adverse events unpleasant symptoms, and adverse events of AR

patientsin patients with AR receiving SCIT. Individuals were more comfortable experienced greater comfort after receiving SCIT using the Z method, which reduced their discomfort and unpleasant sensations. It is advised that the Z technique be employed consistently during SC injection procedures after 3 years of immunotherapy because it is efficient approach that may be used efficiently. In conclusion, it is advised that treatments beneficial for relieving discomfort, pain, and unwanted symptoms be more widely used and that the gathered scientific evidence be applied. Additionally, it is recommended that professional nurses working at primary, secondary, and tertiary care levels, as well as nursing academics, receive support and training in the Z technique, an alternative method for SC injection.

Ethics Committee Approval: Permission to apply to the ethics committee for the study was obtained from the institutions. The Ethics Committee of the Faculty of Health Sciences of the Kafkas University granted approval for Non-Interventional Clinical Research (approval number: 81829502.903/94, date: 30.09.2022).

Informed Consent: Informed consent was obtained from all patients.

Footnotes

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ORIGINAL ARTICLE

An Investigation of the Effect of Professional Values and Certain Variables on Surgical Clinic Nurses' Attitudes Toward Medical Errors: A Descriptive Study

Cerrahi Klinik Hemşirelerinin Tıbbi Hata Tutumları Üzerinde Mesleki Değerlerin ve Bazı Değişkenlerin Etkisinin İncelenmesi: Tanımlayıcı Bir Çalışma

Kadriye Aldemir Atmaca[1], Özlem Şahin Akboğa[2], Atiye Aydın[3]

[1]Department of Nursing, Sivas Cumhuriyet University Suşehri School of Health, Sivas, Turkey
[2]Department of Nursing, Yozgat Bozok University Faculty of Health Sciences, Yozgat, Turkey
[3]İstanbul Provincial Health Directorate, İstanbul, Turkey

Abstract

Objective: This study aims to investigate the effect of professional values and certain descriptive variables on surgical nurses' attitudes toward medical errors.

Method: This descriptive study was conducted among 285 nurses working in the surgical units of a university hospital between March and June, 2024. Data were collected using the descriptive characteristics form, the attitudes toward medical errors scale, and the nursing professional values scale.

Results: The mean score on the professional values scale was 98.83±19.80; the mean score on the attitudes toward medical errors scale was 2.23±0.42. Subscale mean scores were 3.00±0.69 for perceptions of medical errors, 2.03±0.54 for approach to medical errors, and 2.30±0.54 for causes of medical errors. Results of stepwise regression analysis showed that the number of patients cared for, duration of work, overtime work, and professional values affected attitudes toward medical errors, and these variables explained 23.5% of the variance in attitudes toward medical errors.

Conclusion: This study found that the nurses had an above-average mean score for professional values and generally low attitudes toward medical errors. Nurses' attitudes toward medical errors were significantly affected by the number of monthly shifts, overtime work, number of patients cared for, and professional values.

Keywords: Medical errors, attitudes, professional values, surgical nurse, surgical care

Öz

Amaç: Cerrahi hemşirelerin tıbbi hata tutumları üzerinde mesleki değerler ve bazı tanıtıcı değişkenlerin etkisini incelemek amacıyla yapıldı.

Yöntem: Tanımlayıcı türdeki bu araştırma Mart-Haziran 2024 tarihleri arasında bir üniversite hastanesinin cerrahi birimlerinde çalışan 285 hemşire ile yapıldı. "Tanıtıcı özellikler bilgi formu, tıbbi hata tutum ölçeği ve hemşirelik mesleki değerler ölçeği" ile veriler elde edildi.

Bulgular: Hemşirelerin mesleki değerler ölçeğinden aldıkları puanın ortalaması 98,83±19,80, tıbbi hata tutum ölçeği toplam puan ortalaması puanın 2,23±0,42 olurken alt boyutlarından alınan puan ise tıbbi hata algısından 3,00±0,69, tıbbi hata yaklaşımı 2,03±0,54, tıbbi hata nedenleri alt boyutundan 2,30±0,54 puan aldıkları saptandı. Yapılan regresyon analizi ile (stepways) bakım verilen hasta sayısının, çalışma süresinin, fazla mesainin ve mesleki değerlerin tıbbi hata tutumunu etkilediği ve bu değişkenlerin tıbbi hata tutumlarının %23,5'ini açıkladığı bulundu.

Sonuç: Bu araştırmanın sonucu olarak mesleki değerler puanın ortalamanın üstünde olduğu ve hemşirelerin tıbbi hata tutumlarının düşük olduğu görülmektedir. Hemşirelerin tıbbi hata tutumlarını aylık tutulan nöbet sayısının, fazla mesainin, bakım verilen hasta sayısının ve mesleki profesyonelliğin anlamlı düzeyde etkilediği bulunmuştur.

Anahtar Kelimeler: Tıbbi hatalar, tutumlar, mesleki değerler, cerrahi hemşiresi, cerrahi bakım

Corresponding Author:
Kadriye Aldemir Atmaca, kadriyealdemir86@hotmail.com

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Introduction

Although the principle of zero error is observed during health care delivery, the provision of health services with a complex, crowded team may lead to medical errors (1,2). Medical errors are undesirable events that occur at every stage of care, most of which fall under the responsibility of health professionals and affect the patient's health and sometimes the patient's life (3). Medical errors are an important issue for all health service providers. However, due to the variety and complexity of their duties and direct involvement in patient care, nurses are at greater risk of making medical errors than other healthcare personnel (4).

It has been reported that inadequate communication, incomplete reporting, failure to fulfil the patient advocacy role, provision of care below standards, incomplete evaluation and monitoring are among the causes of medical errors caused by nurses (5). It has been revealed that the most important cause of the legal process is negligence. Even if the patient is not harmed, nurses' errors negatively affect the patient's trust in, and satisfaction with, health care (6).

Surgical services and operating rooms, due to their complex and dynamic structures, have higher rates of causing harm to patients and medical errors compared to other units (7). In a study of nurses working in surgical units, 8.3% reported having made a medical error, and nearly half (49.7%) reported having encountered one during their professional careers (8). Another study found that 13.8% of surgical nurses had made a medical error in the past year, and 46.4% had witnessed a medical error made by a colleague (7). Studies highlight that a significant portion of these errors stems from unprofessional behaviors, such as failure to provide necessary care and services; incomplete or poorly executed professional duties; insufficient knowledge, skills, and experience; and negligent or unethical behavior (8,9). This situation underscores the importance of assessing surgical nurses' attitudes toward medical errors and the factors influencing those attitudes.

Professional values, as standards of action or behaviour, form the basis of nurses' attitudes and behaviour (10). Values can be learnt; they are shaped by the sociocultural environment, education, and previous experiences, and they motivate appropriate professional behaviours (11,12). In nursing as a profession serve as a framework for professional standards, practice, and evaluation (13). Values also serve as a guide in providing safe care, demonstrating ethical behaviors (14), and interacting with other members of the profession, other health professionals, and society (15). The literature has documented positive relationships between value incongruence, accident propensity, (16) and burnout (17), a strong relationship between professional values and caring behaviors and competence (18), intention to act in an efficient and accountable way (19) and tendencies towards prevention of medical errors (9). However, an analysis of the literature shows that the relationship between attitudes toward medical errors and professional values has not been reported directly. This study aims to analyze the relationship between surgical nurses' descriptive characteristics and their attitudes toward medical errors and professional values, and to assess its statistical significance. The study also aims to determine the effect of professional values and descriptive characteristics on attitudes toward medical errors. In line with this information, the purpose of this study is to determine the effects of professional values and specific descriptive variables on surgical nurses' attitudes toward medical errors.

Main Points

- Surgical nurses showed above-average professional values but low attitudes toward medical errors.
- Attitudes toward medical errors were significantly associated with education level, years of experience, and workload-related factors.
- The number of patients cared for, overtime work, and monthly shifts negatively affected nurses' attitudes toward medical errors.
- Higher professional values contributed positively to attitudes toward medical errors.
- Reducing nurses' workload and strengthening professional values may help decrease the likelihood of medical errors.

Research Questions

There is a significant difference in attitudes toward medical errors according to surgical nurses' descriptive characteristics. A significant difference exists between the descriptive characteristics and professional values of surgical nurses. Nurses' professional values and descriptive characteristics affect their attitudes toward medical errors.

Material and Method

Design

A descriptive study model was used.

Location and Time

The study was conducted between March and June 2024 among nurses working in the surgical units (operating theatre, surgical clinics, and outpatient clinics) of a university hospital in Central Anatolia. These hospitals include all surgical units, each of which has a clinic. Surgical nurses provide care services in the hospital during the day (08:00-16:00) and night (16:00-08:00) shifts.

Population and Sample

The population consisted of 304 registered nurses working in the surgical units of the hospital where the study was conducted. With a 95% confidence level and a 5% margin of error, the minimum sample size was determined to be 170 (p=0.5, q=0.5) using the sampling method for a known population. The study aimed to reach the entire target population. However, 19 nurses could not be reached: 14 were on maternity leave, 2 were performing military service, and 3 were ill; therefore, the study was completed with 285 nurses.

Data Collection Tools

Questionnaire forms, created by the researchers following literature reviews and evaluations, were used to collect the data. The questionnaire included the "descriptive characteristics form, the attitudes toward medical errors scale (AMES), and the nursing professional values scale".

The descriptive characteristics form was developed using literature (4,7-11). The form included some individual characteristics and working conditions of surgical nurses that were assumed to affect the likelihood of medical errors.

The professional values scale was developed to evaluate nurses' perception and development of professional values. The Turkish validity and reliability of the scale were assessed by Acaroğlu (20). It consists of 26 items on a five-point Likert-type scale. The responses were evaluated as "not important, somewhat important, important, very important, and very, very important". The total score from the scale is calculated by summing the scores corresponding to the participants' answers. Scores obtainable on the scale range from 26 to 130, and higher scores indicate greater adaptation to professional values. There are no reversible items, sub-dimensions, or a cut-off point in the scale (20).

AMES

The scale developed by Güleç and İntepeler (21) consists of 16 questions and three sub-dimensions (perception of medical error, approach to medical error, and reasons for medical error). The scale is a five-point Likert-type scale, and items 10 and 13 are reverse-scored. For the scale calculation, the total raw score is divided by the number of items to obtain a scale score between 1 and 5. The cut-off point of the scale is 3: scores below 3 on the total scale and its sub-dimensions indicate negative attitudes toward medical error, whereas scores of 3 and above indicate positive attitudes (21).

Data Collection

The researchers explained the content of the forms and the study to the nurses in face-to-face meetings. After the interview, the prepared form was given to the nurses who wished to participate in the study. The relevant clinics were visited regularly during night shifts to reach nurses working those shifts.

Statistical Analysis

Data analysis was performed using SPSS version 23.0. Descriptive data were summarized using counts, percentages, means, and standard deviations. Skewness and Kurtosis values were assessed for normality. The independent-samples t-test and one-way analysis of variance were performed on normally distributed data, whereas the Mann-Whitney U test and Kruskal-Wallis test were performed on non-normally distributed data. A simple regression analysis was performed to assess the effects of the influencing factors. The statistical significance level was set at $p<0.05$.

Ethical Considerations

This study was approved by the Yozgat Bozok University Ethics Committee (approval no: 11/23, date: 21.02.2024) and by the hospital administrations (2024-411615). The details of the study were explained to the participants and their informed consent was obtained.

Results

Among the nurses in the study, 71.6% were aged 20-30 years, 65.3% were female, 72.5% were single, and 63.5% had an undergraduate degree. The majority of nurses had 1-5 years of work experience and worked 40 hours per week in shifts. Among the nurses, 61.4% had between 5 and 10 monthly shifts, and 59.3% reported being satisfied with their profession.

A comparison of nurses' descriptive characteristics and their attitudes toward medical errors shows that attitudes increased with increasing education level and years of professional experience ($p=0.001$); differences for other variables were not significant (Table 1). A comparison of nurses' professional values scale scores across their descriptive characteristics showed that nurses younger than 40 years ($p=0.003$), male, with post-graduate education ($p=0.001$), and satisfied with their profession ($p=0.032$) scored significantly higher on the professional values scale (Table 1).

Table 2 presents the nurses' professional values scale and AMES total and subscale mean scores. An analysis of the table shows that the nurses' professional values scale total mean score was 98.83±19.80, and the AMES total mean score was 2.23±0.42. The mean scores for the subscales are 3.00±0.69 for the perception of medical errors, 2.03±0.54 for the approach to medical errors, and 2.30±0.54 for the causes of medical errors (Table 2).

Results of stepwise regression analysis showed that the number of patients cared for, years of professional experience, overtime work, and professional values affected attitudes toward medical errors, and together these variables explained 23.5% of the variance in attitudes toward medical errors (Table 3).

Discussion

Medical errors are a patient safety problem that must be addressed as a priority. Minimizing medical errors requires investigation into their causes (22). Nurses working in surgical clinics have a high propensity for medical errors, with rates ranging from 39.4% to 43.6% in these units (4), which demonstrates the necessity of examining attitudes toward medical errors in surgical clinics. This study found low levels of awareness and attitudes toward medical errors among nurses (Table 2). The literature includes studies that similarly reported low levels of attitudes among surgical nurses toward medical errors (23), as well as studies that reported the opposite (24,25). This finding is likely affected by the descriptive characteristics of the nurses included in the sample, such as education level and years of professional experience. Therefore, the significance test assessing associations between attitudes toward medical errors and descriptive characteristics showed that surgical nurses' attitudes toward medical errors were more positive with increasing education level and years of professional experience (Table 1). In addition, the study was conducted in a tertiary care hospital. Tertiary hospitals serve a large number of patients and employ advanced technologies.

Table 1.
Comparison of Nurses' Descriptive Characteristics with Their Attitudes Towards Medical Errors Scale and Professional Values Scale Mean Scores

Variables	n	%	Attitudes toward medical errors	Test statistic p	Professional values	Test statistic p
Age						
20-30	204	71.60	2.21±0.43	X^2=1.12 p=0.327	98.93±19.39	f=5.85 **p=0.003**
30-40	64	22.50	2.30±0.44		102.40±19.50	
40 and over	17	6.00	2.21±0.23		84.23±20.26	
Gender						
Female	186	65.30	2.20±0.40	t=-1.86	96.77±20,4	t=-2.42
Male	99	34.70	2.29±0.45	p=0.26	102.70±18.05	**p=0.016**
Education status						
High school	61	21.40	2.12±0.36a	X^2=12.22 **p=0.001**	99.40±17.27[a]	X^2=5.93 **p=0.001**
Pre-graduate	24	8.40	2.15±0.30[a]		99.95±16.26[a]	
Undergraduate	181	63.50	2.22±0.42[ab]		96.66±20.10[a]	
Post-graduate	19	6.70	2.69±0.39[c]		116.21±21.03[b]	
Years of working in the profession						
1-5	154	54.00	2.15±0.42[a]	f=8.40 **p=0.001**	99.08±19.29	f=0.85 p=0.42
5-10	75	26.30	2.20±0.45[ab]		100.46±20.85	
10 and over	56	19.60	2.43±0.27[b]		95.96±19.79	
Working style						
Continuously daytime	19	6.70	2.16±0.20	X^2=0.81 p=0.48	89.63±14.35	X^2=2.31 p=0.076
Continuous night	34	11.90	2.28±0.32		94.61±19.02	
Shifts	232	81.40	2.23±0.45		100.18±20.11	
Working hours per week						
40	179	62.80	2.24±0.40	t=0.43	97.27±19.32	t=-1.73
40 and over	106	37.20	2.22±0.46	p=0.66	101.46±20.40	p=0.085
Monthly watch						
0-5	62	21.80	2.29±0.35		94.70±20.19	
5-10	175	61.40	2.21±0.45	f=0.83	100.03±19.38	f=1.73
10 and over	48	16.80	2.22±0.39	p=0.43	99.79±20.50	p=0.17
Satisfaction with the profession						
Satisfied	169	59.30	2.25±0.41	t=1.15	101.89±21.11	t=-2.16
Not satisfied	116	40.70	2.19±0.43	p=0.25	96.75±18.67	**p=0.032**

[a,b,c]=superiors indicate differences between groups, χ^2=indicates the Kruskal-Wallis chi-square test statistic used for comparing non-parametric group differences

Table 2.
Scores of the Professional Values of Nurses Scale, Attitudes Towards Medical Errors Scale and Subscales

Professional values scale total mean score	**Mean (SD) 98.83 (19.80)**
Attitudes toward medical errors scale total mean score	2.23 (0.42)
Attitudes toward medical errors scale subscales	
Perception of medical errors	3.00 (0.69)
Approach to medical errors	2.03 (0.54)
Causes of medical errors	2.30 (0.54)

SD=standard deviation

Table 3.
Factors Affecting Attitudes Toward Medical Errors According to Regression Analysis (Stepways)

Dependet varible	**Independet variables**	**Unstandardized coefficients**		**Standardized coefficients**	**95.0% confidence interval for B**		**t**	**p**
		B	**Standard error**	**Beta**	**Lower bound**	**Upper bound**		
Attitudes toward medical errors	Constant	2.699	0.13		2.443	2.954	20.791	0.001
	Number of patients under care	-0.043	0.006	-0.401	-0.055	-0.032	-7.387	0.001
	Years of working in the profession	0.089	0.031	0.164	0.027	0.150	2.853	0.005
	Overtime work	-0.005	0.001	-0.216	-0.007	-0.002	-4.122	0.001
	Professional values	0.003	0.001	0.147	0.001	0.006	2.68	0.008

Adjusted R^2=0.235, Durbin-Wasson=1.69

This condition, encountered in patient care, may have affected surgical nurses' awareness of medical errors.

Perceptions, approaches, and awareness toward medical errors are inevitably affected by nurses' personal characteristics and working conditions (23,26-28). In the current study, it was found that as nurses' level of education and years of professional experience increased, attitudes towards medical errors increased, while differences in other variables were not significant (Table 1). Most studies indicate that attitudes toward medical errors become more positive as the level of education increases (23,26,27). In line with this study, years of experience in the profession and attitudes toward medical errors were associated in many studies (26-28). For example, Demir Dikmen et al. (29) reported that nurses with less work experience have a higher propensity for medical errors, whereas Er and Özkan (24) found that nurses with approximately 10 years' experience had a higher level of awareness of medical errors. Sufficient awareness of medical errors is somewhat expected as nurses' professional experience increases. These findings suggest that hypothesis H1 was partially supported.

The participating nurses' professional values score was above average (Table 2). Recent studies investigating surgical nurses' perceptions of professional value also reported similar results (30-32). Since 2014, the title of nurse has been given only to individuals who have completed undergraduate education in Turkey. Hence, a large proportion of nurses working in the field had an undergraduate degree. Nurses' high perception of professional values reported in recent studies may be a consequence of this development in education.

The study found that male nurses had significantly higher professional value scores than female nurses (Table 1). However, most studies report that female nurses have higher perceptions of professional values (12,32,33). This difference may be attributed to the higher proportion of male nurses included in this study compared to previous studies.

The study also found that nurses younger than 40 had significantly higher professional value scores (Table 1). While some studies indicate that nurses under 30 have lower professional values (33), others report the opposite (12). It is thought that increasing age enhances experience and professional adaptation, thereby reinforcing professional values.

The literature also demonstrates that higher education levels positively influence nurses' professional values (29,32,34). However, this study did not find a parallel increase in professional values with increasing education level, except that nurses with post-graduate education had significantly higher perceptions of professional values

than those with other education levels (Table 1). Similarly, Daştan et al. (33) reported that nurses with post-graduate education possess higher professional values. Post-graduate education may strengthen nurses' professional identities and contribute to their ability to adopt different perspectives in professional practice.

Another finding of the study is that nurses who are satisfied with their profession report higher perceived professional value. A study examining nurse managers found multiple relationships among nurses' job activities, job satisfaction, patient satisfaction, and medication errors (35). It appears that the better nurses' perceptions and awareness of professional values are, the higher their job satisfaction, which in turn is reflected in their practices.

The present study found that the number of patients cared for, years working in the profession, overtime, and professional values affected attitudes toward medical errors; these variables explained 23.5% of the variance in attitudes toward medical errors. An increased number of monthly shifts (36) and prolonged working hours (37) have been reported to increase the risk of medical errors. A study reported that when a surgical nurse caring for four patients takes on an additional patient, the patient's risk of death increases significantly (38). Another study identified the patient-to-nurse ratio as the cause of medical errors (39). These findings indicate that high workload is an important cause of medical errors. Errors in the administration of medication, one of the medical errors, included work experiences, availability of guidelines for the administration of medication, education level, interruptions during the administration of medication, and working on night shifts (40) In addition to many other factors that increase nurses' risk of committing medical errors, low perceived professional value also contributes to that risk. A strong, highly significant negative relationship was reported between professionalism and the tendency to make medical errors, and nurses' professional attitudes explained 30% of the variance in the propensity for medical errors (8). These findings suggest that explaining the causes of medical errors requires evaluating various factors.

Study Limitations

The sample size was calculated by power analysis and in addition to being based on sampling probability.

Conclusion

This study is one of the few that examine the impact of professional values and certain variables on the attitudes of nurses in surgical clinics toward medical errors. The findings from this study will guide future research and provide new evidence on the importance of professional nursing. This study found that nurses had an above-average mean score for professional values and low attitude scores toward medical errors. Nurses' attitudes toward medical errors were found to be significantly affected by the number of monthly shifts, overtime work, the number of patients cared for, and professional values. A high workload inevitably increases the propensity for medical errors. The positive development in nurses' perception of professional values in the country should not be overlooked. These could be considered the results of the separation of job descriptions, positive developments in education levels, and improvements such as the conferment of the title "specialist nurse" in the country's recent nursing regulation. Positive effects on the propensity to commit medical errors are considered inevitable among nurses who perceive themselves as valuable with regard to professional development. Based on the results of this study, it is recommended that surgical nurses' workload be reduced and perceived professional value be improved through policies aimed at minimizing medical error rates. Another recommendation is to consider multiple factors when investigating the causes of medical errors.

Ethics Committee Approval: This study was approved by the Yozgat Bozok University Ethics Committee (approval no: 11/23, date: 21.02.2024) and by the hospital administrations (2024-411615).

Informed Consent: The details of the study were explained to the participants and their informed consent was obtained.

Footnotes

Author Contributions: Concept - K.A.A., Ö.Ş.A., A.A.; Design - K.A.A.; Data Collection or Processing - K.A.A.; Analysis or Interpretation - K.A.A., Ö.Ş.A.; Literature Search - K.A.A., Ö.Ş.A.; Writing - K.A.A., Ö.Ş.A.

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ORIGINAL ARTICLE

Fifty-year History of Gynecological Cancer in Nursing Research: A Mapping Hotspots and Theme Trends Evaluation: A Bibliometric Study

Hemşirelik Araştırmalarında Jinekolojik Kanserin 50 Yıllık Geçmişi: Haritalama Noktaları ve Tema Eğilimleri Değerlendirmesi

Ayşe Deliktaş Demirci[1], Aysu Buldum[2], Ahu Aksoy Can[2], Aslıhan Aksu[3]

[1]Department of Obstetrics and Gynecological Nursing, Akdeniz University Faculty of Nursing, Antalya, Turkey
[2]Department of Obstetrics and Gynecological Nursing, Mersin University Faculty of Nursing, Mersin, Turkey
[3]Department of Obstetrics and Gynecological Nursing, Kahramanmaraş Sütçü İmam University Faculty of Health Sciences, Kahramanmaraş, Turkey

Abstract

Objective: The present study aimed to determine the current status and development of nursing studies on gynecological cancer.

Method: A bibliometric study was performed using the Web of Science (WoS) database on 22nd February 2024 to search for original articles. Articles were accessed by searching using related terms "gynecologic cancer", "cervix cancer", "vaginal cancer", "endometrium cancer", "vulva cancer" and "genital cancer" without year limitation. The analysis was performed using 1307 records. The R software, version 4.3.0, Bibliometrix package was used to perform data analysis and visualization. Data were limited to publications that are in English and stored on WoS.

Results: One-third of the publications were conducted in the United States of America, where the incidence of gynecological cancer is lower. This is followed by other countries that conducted many fewer studies despite having the highest incidence of gynecological cancers worldwide. The high density and centrality in nursing research were identified in: cervical cancer and its prevention approach, rehabilitation, empowerment of cancer survivorship, and psychosocial issues. Oncology nursing, quality of life, chemotherapy, anxiety, gynecological cancer which have high centrality in nursing research is a central topic but it has lower density.

Conclusion: Nurse researchers aim to address the increased needs of women with gynecological cancer. It has been observed that the intensity of nursing research is related to country policies. Trends in research indicate that nurses are turning towards patient-centered care and critical research areas aimed at improving the quality of care. The study pointed to more actionable suggestions for nursing practice, research, education, and policy.

Keywords: Endometrial neoplasms, nursing research, oncology nursing, ovarian neoplasms, uterine cervical neoplasms, vaginal neoplasms

Öz

Amaç: Bu çalışmanın amacı jinekolojik kanser üzerine hemşirelik çalışmalarının mevcut durumunu ve gelişimini belirlemektir.

Yöntem: Orijinal makaleleri taramak için 22 Şubat 2024'te Web of Science (WoS) veritabanı kullanılarak bibliyometrik bir çalışma olarak yapılmıştır. Makalelere yıl sınırlaması yapılmaksızın "jinekolojik kanser", "serviks kanseri", "vajina kanseri", "endometriyum kanseri", "vulva kanseri" ve "genital kanser" anahtar kelimeleri kullanılarak yapılan tarama ile ulaşılmıştır. Analiz, 1307 kayıt kullanılarak yürütülmüştür. Veri analizi ve görselleştirmesi için R yazılım sürümü 4.3.0 Bibliometrix paketi kullanılmıştır. Çalışmanın verileri, İngilizce dilinde yayınlanan ve WoS'de depolanan makaleler ile sınırlıdır.

Bulgular: Yayınların üçte biri, jinekolojik kanser insidansının daha düşük olduğu Amerika Birleşik Devletleri'nde yapılmış, bunu dünya çapında en yüksek jinekolojik kanser insidansına sahip çok daha az çalışma yürüten diğer ülkeler izlemiştir. Hemşirelik araştırmalarındaki jinekolojik kanser konularında yüksek yoğunluk ve merkezilik, serviks kanseri ve önlenmesi yaklaşımı, rehabilitasyon, kanserden sağ kurtulanların güçlendirilmesi ve psikososyal konular olarak belirlenmiştir. Hemşirelik araştırmalarında yüksek merkeziliğe sahip olan onkoloji hemşireliği trend bir konudur ancak daha düşük yoğunluğa sahiptir.

Sonuç: Hemşire araştırmacılar, araştırma yoluyla jinekolojik kanserli kadınların artan ihtiyaçlarını karşılamaya çalışmaktadır. Hemşirelik araştırmalarının yoğunluğunun ülke politikaları ile ilişkili olduğu görülmüştür. Araştırmalardaki eğilimler, hemşirelerin hasta merkezli bakıma ve bakım kalitesini artıran kritik araştırma alanlarına yöneldiğini göstermektedir. Çalışmada hemşirelik uygulamaları, araştırmaları, eğitimleri ve politikaları için daha uygulanabilir önerilere yer verilmiştir.

Anahtar Kelimeler: Endometrial neoplazmalar, hemşirelik araştırmaları, onkoloji hemşireliği, over neoplazmaları, uterin servikal neoplazmalar, vajinal neoplazmalar

Corresponding Author:
Ayşe Deliktaş Demirci, aysedeliktas@akdeniz.edu.tr

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Introduction

Gynecological cancers have high incidence and cancer-related mortality rates worldwide (1). The International Agency for Research on Cancer, as reported on the Global Cancer Observatory platform, stated that gynecological cancers constituted a significant proportion of the 9.6 million new cancer cases in women. The incidence of all new cases is: cervix uteri: 14.1, corpus uteri: 8.4, ovary: 6.7, vulva: 0.83, and vagina: 0.36 per 100,000 person-years (2). The financial burden of gynecological cancers on countries' health systems is considerable. Also, for patients, cancer treatment may be inaccessible or some medical care may be delayed due to costs (3). Therefore, gynecological cancer needs to be prioritized in healthcare research, practice, and policies.

Gynecological cancers have vague symptoms that women may ignore may have no symptoms at all (3). To date, routine screening has been performed only for cervical cancer. Although women are increasingly surviving gynecological cancer treatment with current technologies, it remains a serious public health problem because of the lack of or ineffectiveness in current screening programs (4,5). Nurses are in a unique position to educate women about the importance of preventive measures and modifiable risk behaviors related to gynecological cancers. Likewise, nurses provide supportive care to patients diagnosed with gynecological cancer, aiming to meet their physical, social, spiritual, and sexual information needs, by providing symptom management (6).

Gynecological cancers affect women's physical and emotional capacity for sexual activity and fertility and are potentially life-threatening (7,8). Although women perceive gynecological cancer as a threat to their body image, sexual life, and reproductive capabilities (9), they still have unmet distinct supportive nursing care needs (6). Oncology nurses are closely involved with patients in the assessment and management of cancer symptoms. However, little is known about whether and how oncology nursing studies focusing on gynecological cancers have found that nurse-led interventions can improve the physical and psychosocial well-being of women with gynecological cancers (10,11). As far as it is known, no study has identified the current state and evolution of oncology nursing studies on gynecological cancer. The primary role of nurse scientists in conducting health research is to increase their knowledge of the discipline, and provide evidence to inform and advance health policies to improve the health outcomes of society (12). Therefore, to bring renewed attention to the topic of gynecological cancer, this study aimed to identify the the current status and development of nursing studies on gynecological cancer using bibliometric analysis. The handling of knowledge from the present study will provide up-to-date insights into trending topics and encourage new directions for future research, informing not only practices but also healthcare policies.

Main Points

- Nurse researchers try to meet the increased needs of women with gynecological cancer through research.
- Nurses'research mostly focuses on cervical cancer and its prevention.
- Nursing research which may give a direct to the cancer care policies.
- Nurses place high priority on empowerment concepts for promoting health.
- Oncology nursing, quality of life, chemotherapy, anxiety, gynecological cancer, endometrial cancer, and ovarian cancer need to be studied further as distinct concepts.

Material and Method

Ethical approval was not required for this study, as it did not have any direct impact on humans or animals.

Study Design

This descriptive bibliometric study was conducted to explore the literature on gynecological cancer in nursing.

Research Questions

• What is the number of gynecological studies in nursing?

• What are the most productive researchers, countries, and journals in the field of gynecology nursing research?

• What is the co-occurrence map of author keywords for gynecologic cancer research in nursing?

• What is the thematic map of keywords in gynecologic cancer research in nursing?

• What are the trending topic keywords in research on gynecologic cancer in nursing?

• What is the thematic evaluation of keywords in gynecologic cancer nursing research?

Study Population and Sample

The population of the present study was comprised of participants in gynecological cancer research within nursing areas. This study was conducted using data extracted from the Web of Science (WoS) Core Collection database. Since the WoS is the most selective database and almost all health sciences journals with high impact values are indexed, it was used for data extraction in this study (13).

Search Strategy

The bibliometric methodology employs quantitative techniques to explore emerging trends in article and journal performance, collaboration patterns, research constituents, and the structure of a specific topic in the literature (14). The inclusion criteria were being a study on gynecologic cancer, having at least one author who was a nursing researcher, being an article, being in English, and being indexed Institute for Scientific Information (ISI), which provides access to

publications in highly indexed journals. There was no year limitation during the search process. The data search was conducted on February 22, 2024. The subject headings medical and related terms "gynaecologic cancer", "cervix cancer", "vaginal cancer", "endometrium cancer", "vulva cancer" and "genital cancer" were used in the WoS database. Keyword groups were created by variations with different uses of word groups, such as "gynecological cancer" or "gynecologic cancer". This includes English [United States of America (USA), United Kingdom] style pronunciation (gynecological, gynaecological, etc.) and different words used similarly in the field of "cancer" (neoplasm, malignancy). These variations aim to encompass gynecologic cancer and its types (endometrium, cervix, vagina, vulva, genital) in the topic area (please see supplementary file for search strategy).

Data Collection

Data were extracted from the comprehensive WoS core collection database. which is a widely used source of abstracts and citations for peer-reviewed literature, particularly for bibliometric analysis (15). A literature search was conducted by two independent researchers A.D.D. and A.B. using the agreed filters (categories, document types, and languages). Due to the filters used, any study was not excluded. The data collection process took almost one week. This study only focused on 1307 records, of the document type "articles" in the field of nursing, indexed in the ISI. During the search process, the researchers used the predefined protocol, which strictly defined inclusion criteria and filters. After the independent literature search process, search results were compared and discussed. Because there was no disagreement about the search results, a single data file was used; it was checked by the researchers for typing errors and converted into a form suitable for data analysis. All information regarding publication settings (citation information, bibliographic information, abstract and keywords, other information, full records, and cited references) was exported in the TXT format. The exported publication records included the title, authors, name of the research institution, abstract, journal, publication date, and other bibliometric information, which provided a solid foundation for the analysis. The bibliometric results were visualized using R, enhancing the clarity of trends and relationships. However, the reliance on a single database and the exclusion of non-English studies may limit the comprehensiveness of the results.

Statistical Analysis

This study utilized bibliometric data analysis techniques, including performance analysis and science mapping, to explore the contribution of nursing research on gynecological cancer to publication-related metrics. A performance analysis was conducted to examine the contributions made to nursing research on gynecological cancers. The analysis presents various publication-related metrics, including total publications, publication year, productive authors, countries in which the studies were conducted, and journals in which the studies were published.

Science mapping, including co-word analysis, is an effective method for identifying specific structures in a research field and for presenting its bibliometric and intellectual structure (16,17). A co-word map and word cloud were generated by setting the node number to 25 and the keyword co-occurrence rate to 2. The word cloud shows the most frequently used keywords among the 25 authors. These numbers are automatically suggested by the program with other chooses. The authors selected the optimal outcomes based on findings, that guarantee the identified clusters are meaningful and representative of the underlying research structure. These results were deemed the most favorable.

The study used techniques to improve bibliometric analysis, such as thematic maps, thematic evolution analysis, and visualization. Thematic maps display the degree of centrality and density of the theme, with the upper map (motor themes, niche themes) showing high-density clusters and the lower map (basic themes, emerging, and declining themes) showing low-density clusters (18). The number of words in the thematic map analysis was 250. The minimum cluster frequency was 5, and the level number for each cluster was 1. A thematic evolution analysis, which explores evolutionary trends in thematic contexts and structures, was conducted to define the evolution of gynecological cancer research in nursing over the past 50 years.

Highly relevant keywords form thematic clusters based on the most frequently used keywords (19). During the analysis, the number of studies was considered when determining the year intervals, which were presented at three levels. The minimum word frequency was accepted as two, and the minimum number of words observed per year was taken as one. The R software version 4.3.0, Bibliometrix Package, Biblioshiny Interface was used to perform data analysis and visualization (20).

Rigor

The data search strategy was transparent and replicable, demonstrating the validity and reliability of the bibliometric study. All data were retrieved from the WoS database in the TXT format. Two researchers A.D.D. and A.B. who both have experience in nursing research, literature review, and bibliometric analysis independently included and excluded articles. During the search process, the researchers used the predefined protocol which strictly defined inclusion criteria and filters. Therefore, there were no disagreements about the search results. Because of there were no any disaggrement about search results, one data file used, it was checked by the researchers for typing errors, and converted into a form suitable for data analysis. To ensure the repeatability of the present study, all of the steps

performed in the study are explicitly described. Due to the use of the Biblioshiny package, it does not require coding or entering commands. The TXT-format data retrieved from the WoS database was imported as new raw file. After clicking "start" following file import, labels description (such as for authors, titles, abstracts, keywords etc.) in biblioshiny appeared in the "completeness of bibliographic metadata". The authors checked data to detect and correct errors or inconsistencies in the data; there were no incomplete and ambiguous records.

Results

Number of Gynecological Studies in Nursing

The results of the WoS database search indicated that nurses have been conducting research in the field of gynecological cancer in the last 50 years, since 1973. However, the number of publications, which were published once a year until 1990, has continued to increase with great momentum since 2013. Although there was a decrease in the number of publications between 2019 and 2020, it was determined that the number of publications was higher than previous years. Gynaecologic research in oncology nursing science will reach its peak in 2022 (Figure 1).

The Most Productive Researchers, Countries, and Journals in the Field of Gynecology Nursing Research

A total of 1307 publications were produced with the contributions of 3,690 authors and published in 122 journals. The author who contributed the most to the field in terms of number of publications (n=23) was Chan CWH, and the author who received the most citations in studies was Sekse RJT (n=114). The country where the most studies were conducted was the USA (n=469), showing a large difference compared to other countries. The second country was China, with 164 publications. The journals with the most publications in the field were cancer nursing (n=198), European Journal of Cancer Care (n=149), and European Journal of Oncology Nursing (n=106). The first three journals that contributed to the field and were frequently cited as references were Gynaecol Oncol (n=1279), Psycho-Oncology (n=973), and Cancer Nursing (n=962). The top ten lists for the performance analysis are presented in Table 1.

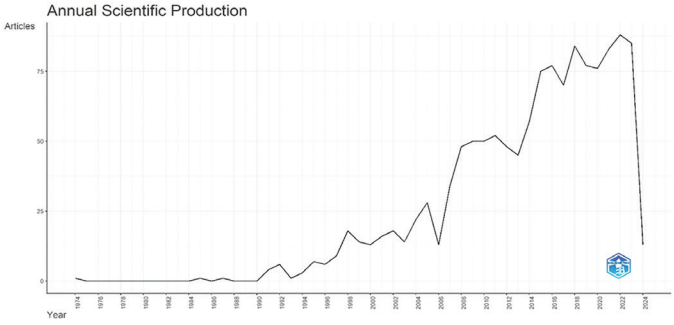

Figure 1.
The Number of Gynecological Cancer Publications in Nursing Per Year

The Co-occurrence Map of Author Keywords for Gynecologic Cancer Research in Nursing

The keywords most frequently used by the authors in oncology nursing research are visualized in the word cloud in Figure 2. In publications in this field, the most frequently handled topics are cervical cancer (246 times), gynecological cancer (155 times), quality of life (139 times), ovarian cancer (104 times), cancer (80 times), breast cancer (72 times), nursing (72 times), screening (58 times), chemotherapy (54 times), and women's health (52 times).

Research was categorized by co-occurrence network analysis into two thematic clusters, covering the related topics and their connections: cervical cancer and gynecological cancer. Cervical cancer covers the following ten topics: cancer screening (Betw=37.597, Clos=0.013), women's health (Betw=12.313, Clos=0.012), cervical cancer screening (Betw=1.702, Clos=0.011), human papillomavirus (Betw=7.886, Clos=0.011), knowledge (Betw=27.409, Clos=0.012), women (Betw=4.270, Clos=0.012), uterine cervical neoplasms (Betw=11.406, Clos=0.011), pap smear (Betw=1.389, Clos=0.010), cervical screening (Betw=1.019, Clos=0.010), and prevention (Betw=8.962, Clos=0.011). The top 10 topics which are related to the gynecological cancer topics are as follows: quality of life (Betw=65.171, Clos=0.014), ovarian cancer (Betw=67.168, Clos=0.014), oncologic nursing (Betw=39.374, Clos=0.014), chemotherapy (Betw=6.057, Clos=0.012), endometrial cancer (Betw=9.056, Clos=0.012), sexual health (Betw=5.608, Clos=0.011), qualitative (Betw=6.979, Clos=0.012), anxiety (Betw=2.547, Clos=0.011), social support (Betw=5.011, Clos=0.011), and symptoms (Betw=0.976, Clos=0.011). All the nodes, referred to as topics, and their networks are shown in Figure 3.

Thematic Map of Keywords in Gynecologic Cancer Research in Nursing

The theme map presented topics based on their density, the development of themes, and the centrality of their relevance to gynecological cancer research in nursing science (Figure 4). Motor themes that had high density and centrality in oncology nursing research, which represent advanced knowledge in gynecological cancer research in nursing science, meaning these topics are important and intensively researched, were identified as cervical cancer, cancer screening, women's health, breast cancer, genetic counselling, and genetics. Niche themes that exhibited high density but not high centrality in nursing science, signifying specialized knowledge that is highly studied due to its importance among special groups, included fear of cancer recurrence, focus groups, information needs, female sex, genital neoplasms, and brachytherapy. Basic themes with lower density but higher centrality, denoting foundational knowledge that is basic yet core to the field, indicating a need to focus more on research, were identified as quality of life, chemotherapy, anxiety, gynecological cancer, ovarian cancer, and oncologic nursing. Emerging or declining themes that had low density and centrality due to a lack of interest or current focus on the topic, such as breastfeeding and adherence, were listed.

Table 1.
Top-10 List of Journals, Authors, and Countries of Gynecological Cancer Research in Nursing

	Journal		Author		Country	
Rank	**Articles published**	**Frequency**	**Articles published**	**Frequency**	**Articles published**	**Frequency**
1	Cancer Nursing	198	Chan CWH	23	United States of America	469
2	European Journal of Cancer Care	149	Afiyanti Y	20	China	161
3	European Journal of Oncology Nursing	106	Miaskowski C	19	United Kingdom	79
4	Oncology Nursing Forum	82	Sekse RJT	18	Australia	61
5	Journal of Clinical Nursing	47	Hammer MJ	14	Brazil	60
6	Journal of Advanced Nursing	44	Bruner DW	12	Canada	50
7	Clinical Journal of Oncology Nursing	39	Carlson NS	11	Turkey	47
8	JOGNN	39	Maree JE	11	Korea	40
9	Asia-Pacific Journal of Oncology Nursing	32	So WKW	11	Indonesia	34
10	Enfermeria Clinica	24	Bai JB	10	Denmark	30

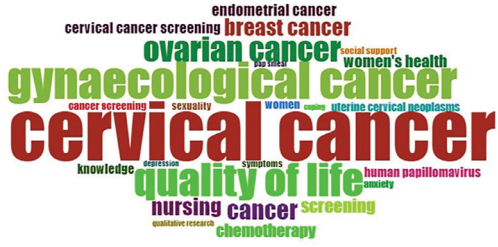

Figure 2.
Word Cloud of Gynecological Cancer in Nursing Research
As the frequency of words increases, they appear bigger in the word cloud

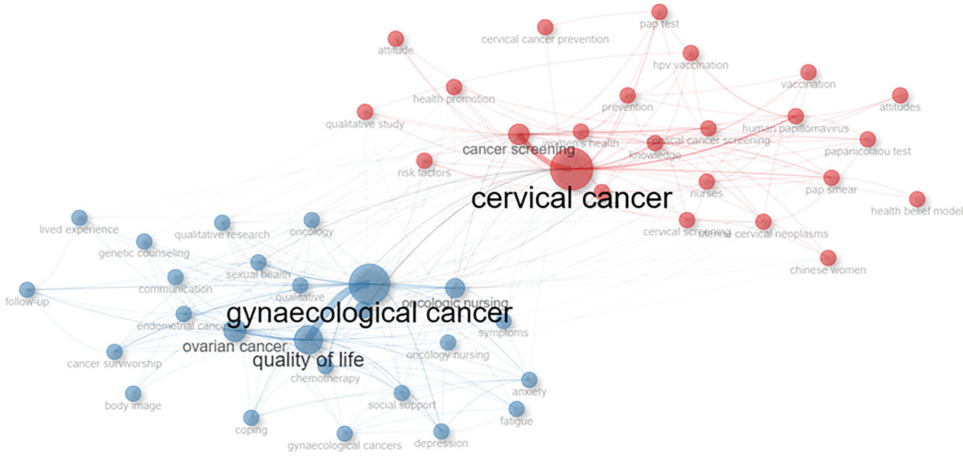

Figure 3.
Co-words (Keyword Co-occurance) Map of Publications Which are About Gynecological in Nursing
Any author keyword is represented by a node in a network, and in the case of Figure 3, that keyword is represented by a node, with the following features: (1) the size of the node indicates the occurrence of the keyword; (2) the link between the nodes represents the co-occurrence between keywords; and (3) the thickness of the link signals the occurrence of co-occurrences between keywords. Each colour indicates a thematic cluster, and the nodes and links within each cluster can be used to explain the topics (nodes) that each cluster covers as well as the connections (links) that exist between the topics (nodes) that are expressed under each cluster

Trending Topic Keywords in Research on Gynecologic Cancer in Nursing

The trends in gynecological cancer studies in nursing over 20 years are shown in Figure 5. Earlier trends in gynecological cancer research in nursing were mostly focused on cancer prevention and diagnosis, using keywords such as cancer prevention, early detection, diagnosis, genetic counselling, and health beliefs. In recent years, the trends have shifted to focus on meta-analysis, gynecological cancers, cancer rehabilitation, coping, stress, self-management, chemotherapy, depression, body image, anxiety, cancer survivorship, and oncology nursing.

Thematic Evaluation of Keywords in Gynecologic Cancer Nursing Research

Figure 6 shows the thematic evolution, presenting how research topics have changed according to the years. The most frequently used keywords were cervical cancer screening in 1974-1999; breast cancer, followed by cervical cancer; in 2000-2012; and cervical cancer, gynecological cancer, endometrial cancer, health literacy, and palliative care in 2013-2024 (Figure 6).

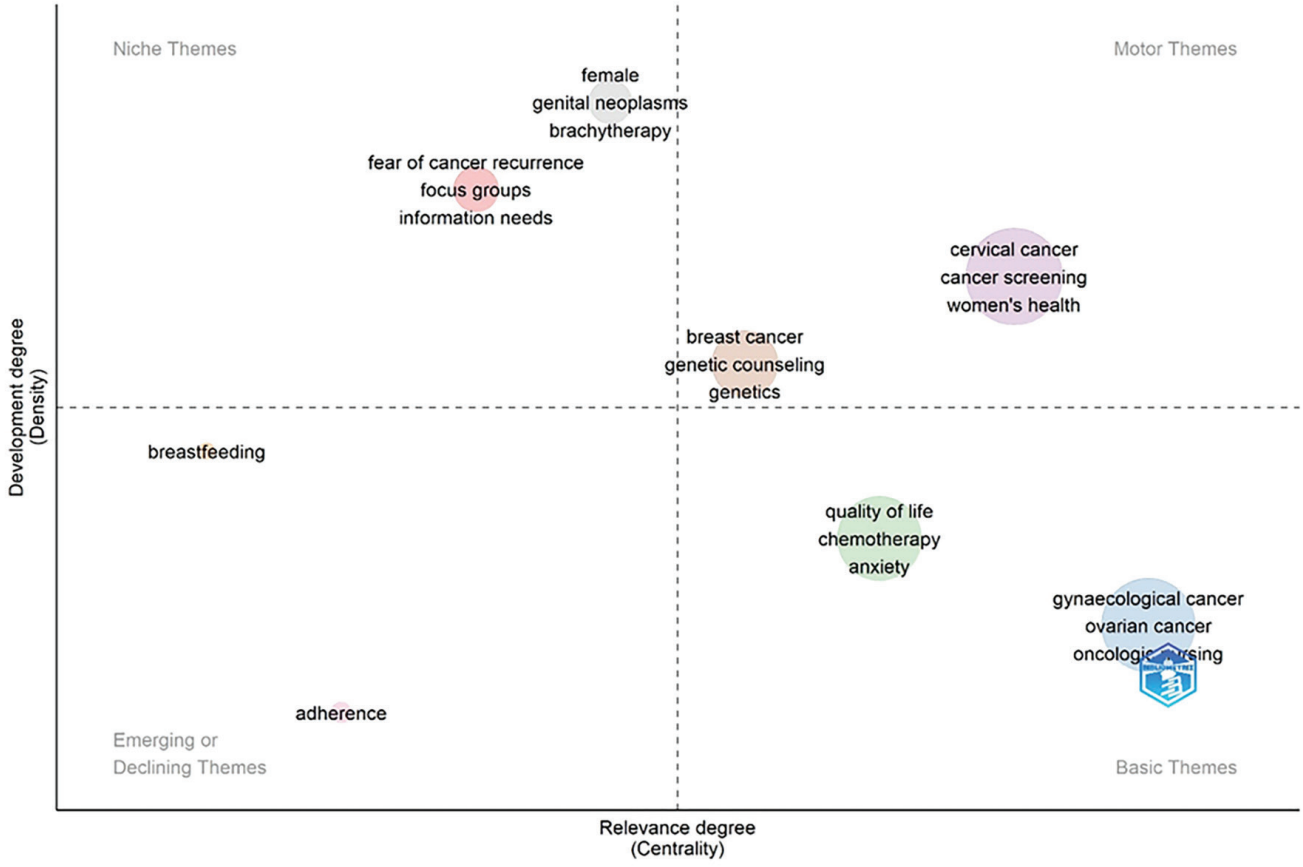

Figure 4.
Thematic Map of Gynecological Cancer in Nursing Research

Motor themes: the highly developed and significant theme clusters in the upper right quadrant. The quadrant contains dense clusters and strong centrality. Niche themes are represented by low centrality, and dense clusters in the upper left quadrant. These clusters'connections to other themes are significant, but their numbers are limited. Basic themes: the clusters in the lower right are themes that are mostly related to one another but have weak relationships with other themes. The clusters in the lower left quadrant represent themes that are either emerging or declining; they have few and weak connections to other themes

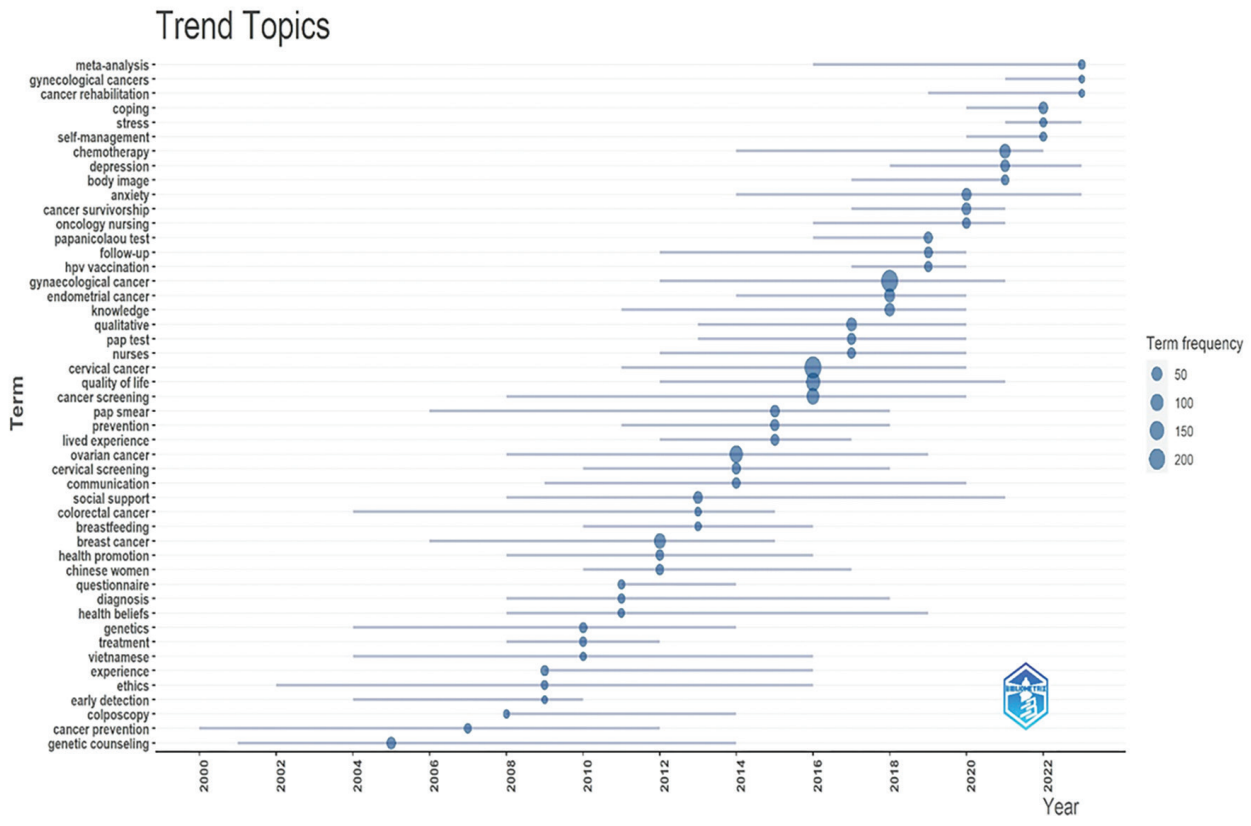

Figure 5.
Trend Topics of Gynecological Cancer in Nursing Research

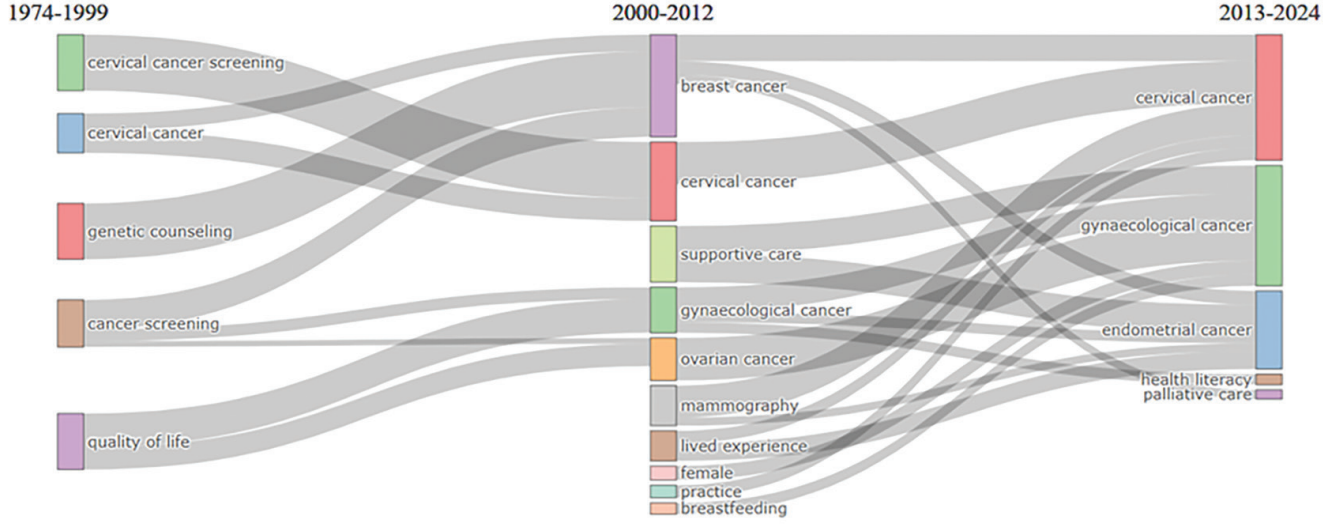

Figure 6.
Thematic Evolution of Gynecological Cancer in Nursing Research

Discussion

Number of Gynecological Studies in Nursing

Gynecological cancers are an ongoing concern because of their morbidity and mortality rates (5,21). Therefore, this study aimed to identify the research focus and thematic trends in research on gynecological cancer in nursing using bibliometric analysis. Although gynaecologic cancer research in nursing began 50 years ago, it has gained momentum over the last decade. It is an indicator of knowledge about gynecological cancers that is just beginning to develop in the nursing field. Gynecological cancers accounted for 18.6% of all cancer incidences and 15.3% of all cancer-related deaths in women worldwide in 2002. These figures significantly increased to 40% and 30%, respectively, in 2020, doubling from their previous values (2). Despite concerted efforts by healthcare professionals, educators, and governments to raise awareness about cancer and implement risk-reduction strategies (22), the incidence and mortality rates of cancer continue to rise rapidly. This increase is attributed to factors such as an ageing population, tobacco consumption, and obesity (23-25). Cancer remains a major threat to global health and longevity, with approximately 19.3 million new cases and 10 million deaths reported worldwide in 2020 (25). Advancements in medical technology have introduced new methods to extend the lives of cancer patients, presenting both opportunities and challenges in oncology nursing (26). Consequently, "gynecological cancer research" has gained prominence in nursing science in recent years. A decline in publications was observed between 2019 and 2020, likely due to the coronavirus disease-2019 (COVID-19) pandemic, which was first identified in China in December 2019 and rapidly spread globally. This led the World Health Organization (WHO) to declare a Public Health Emergency of International Concern on January 30, 2020, and classify the outbreak as a pandemic on March 11, 2020 (27). The COVID-19 pandemic has significantly impacted oncology nursing research, creating challenges such as restricted access to research settings, difficulties in recruitment and retention, delays and contamination of data collection and interventions, modifications in data collection methods, increased costs, and heightened stress among researchers (28).

The Most Productive Countries in the Field of Gynecology Nursing Research

It is remarkable that one third of the studies were conducted in the USA, followed by other countries that conducted many fewer studies. The incidence of gynecologic cancer is lower in the USA than in other countries. Because women are vaccinated, screened, and treated at higher rates (2,29,30). Africa and Southeast Asia are the regions with the highest incidence of gynecologic cancers worldwide (2). However, our study revealed the number of studies on gynecological cancers in these regions, is low. Previous studies have shown that women in those regions are unable to participate in cervical cancer screening due to poverty, rural location, lack of information, and difficulty accessing health care services, reflecting income inequality (31-34). Prevention of gynecological cancers is necessary to protect and improve health. Gynecologic cancer research and interventions must be increased in underdeveloped and developing countries. Based on these studies, countries can take a strategic approach to cancer control in their health policies by identifying the needs of these regions. Nurse scientists conduct research to determine the health needs of the society and to improve health outcomes. In this context, the developing structure of nursing science has a great impact on guiding health policies (27). Nurses can participate in policy making and influence policy makers (12,35). This may explain the correlation between the increasing number of studies and the decreasing number of gynaecological cancers, due to the health services provided. Access to health services and the healthcare budget to prevent diseases and improve health are closely linked to a country's level of development (36).

The Co-occurrence Map of Author Keywords for Gynecologic Cancer Research in Nursing

We found that most of the studies focused on cervical cancer, usually in the context of preventive measures (screening, Pap smears, etc.). Cervical cancer is the most common gynaecological cancer worldwide (2). It is also the only gynaecological cancer included in cancer screening programmes in countries with specific screening (37). This finding is not surprising in nursing research. In addition to being caregivers, nurses have important counselling and education roles in cervical cancer screening programmes. Therefore, nurses have carried out studies to raise awareness about health promotion and prevention by considering their roles in these areas. The inclusion of concepts such as sexual health and social support in gynaecological cancer studies, albeit to a lesser extent, is an important effort to improve nursing care in cancer. Studies found that gynaecological cancer was associated with the sexual quality of life and psychological concepts. Gynaecological cancer may lead to psychological symptoms such as depression, anxiety and stress in women (38). This situation shows that nurses should focus not only on the physical needs of women with cancer but also on their emotional and social needs. Future research addressing the gaps in these underrepresented areas and prioritising these issues will increase the chances of translating the findings into practice and thus ensure more efficient use of limited resources.

Thematic Map of Keywords in Gynecologic Cancer Research in Nursing

A striking finding in thematic mapping is that cervical cancer is identified as a central and intensively studied topic, which has maintained this feature in thematic evolution over the years. This is because the success rate of preventive measures is low in low- and middle-income countries where cervical cancer is most common (39).

It was observed that gynaecological cancers and related concepts were less frequently addressed in the studies. Although these concepts are at the centre of thematic mapping, they have not been sufficiently studied. Studies revealed that the terms "ovarian" and "endometrial" cancer were used less frequently than gynaecological cancer and related terms. According to global statistics, ovarian cancer follows cervical cancer as the second most common, followed by endometrial cancer. While endometrial cancer is the most common type of cancer in Western and other developed countries, cervical cancer is a leading cause of cancer-related deaths (2). Ovarian and endometrial cancers, which have a worse prognosis and higher disease burden than cervical cancer, are less studied, possibly due to the delays in the search for treatment of these cancers. This is because these gynaecological cancers are diagnosed at an advanced or late stage, and patients with these cancers may have limited participation in clinical trials (40). In addition, resources allocated to cancer research are often directed to types that affect larger populations, such as cervical cancer. This study highlights the importance of greater inclusion of ovarian and endometrial cancers in the nursing literature, although they are often overlooked in existing studies. In order to draw attention to the importance of these cancers, policy makers should organize campaigns and private and public institutions should provide research funds. This will ensure that these cancer types are more thoroughly addressed in nursing research, leading to an increase in nursing knowledge.

Trending Topic and Thematic Evaluation Keywords in Research on Gynecologic Cancer in Nursing

In gynecologic cancer research, there is currently an increased emphasis on themes such as "meta-analysis", "cancer rehabilitation", "self-management" and "oncology nursing". These trends indicate that nurses are focusing on patient-centered care and critical research areas that improve the quality of care. Moreover, the trending topics of "anxiety", "depression", and "body image" in nursing research are a reflection of the growing awareness of the psychosocial aspects of patient care. Thus, the concept of nursing care that includes not only physical recovery but also psychological, social, and cognitive support for patients has become increasingly prominent in nursing research. In line with the results of this research, integrating a patient-centered and holistic approach into the care of women with gynecologic cancer may improve health outcomes. In addition to these, the concepts of "cancer survivorship" and "self-management" have emerged as current topics in gynecologic cancer research in nursing. This trend may be because cancer treatment processes are long and survival rates are increasing. Therefore, nursing care should focus on enabling patients to make active decisions about their own health and better manage their recovery. However, future research should prioritize these areas to effectively address these new needs.

Thematic analysis has evolved in recent years to include broader topics such as "health literacy" and "palliative care". The importance of health literacy in improving public health at low cost has been emphasised by both the WHO and the United Nations, in line with the Sustainable Development Goals (41,42). According to the health literacy model proposed by WHO, health literacy is integrated into interacts with concepts such as empowerment and sustainability (43,44). In addition, health literacy is closely related to "self-management", which is another trending topic, as it improves individuals'ability to cope with health and related physical and emotional problems (45). In addition, palliative care is another prominent topic in the thematic development analysis. Palliative care is of great importance in terms of improving the quality of life of cancer patients, managing their symptoms and providing psychological, physical and emotional support for treatment (46,47). The need for palliative care is increasing with improved survival rates in gynecological cancers. Therefore, since this is a developing field in nursing studies, more research is needed about palliative care. "Oncology nursing" is one of the trending topics in the thematic evolution analysis. Oncology nurses are at the heart of tackling the increasing global cancer burden (48). In addition, the future importance of the oncology nursing workforce has been highlighted in the call from the International Council of Nurses, Nursing Now, and the WHO to address the growing global burden of cancer. Nurses are called upon to take responsibility for their key role in achieving global cancer control goals by moving to higher levels of leadership, advocacy, and policy-making (49). This indicates that oncology nursing should be frequently addressed in future studies. Nurses can demonstrate strong leadership by taking an active role in identifying problems in the health system and areas for improvement in the care they provide, specifically to gynecologic cancer patients and their families, with whom they interact directly. In addition, they not only provide nursing care but also raise awareness at the societal level and influence health policies by voicing the needs of their patients. Furthermore, nurses act as advocates in the dissemination and implementation of cancer screening programs so that cancer patients have equal access to treatment and receive quality care.

Study Limitations

This study's strength is that it is the first bibliometric study to identify the performance, focus of research, thematic trends, and evolution of gynaecologic cancer studies in nursing. Data analysis was carried out using several complementary techniques, such as visualization, thematic maps, and thematic assessments, to present and reinforce the results. However, the current study had some limitations. For example, only articles published in English were included in the study. Although English is the most common language in the literature, there are articles in other languages that can be informative. Furthermore, only the WoS databases were used in this study.

Implications for practice: This study indicates that a patient-centered and holistic approach is being integrated into new trends in gynecologic cancer research in nursing. To reflect this trend in clinical practice and increase positive

health outcomes, it may be important to develop patient-centered care plans that support psychological and social well-being for women with gynecologic cancer. Evidence-based care protocols should be developed, clinical guidelines should be updated, and current evidence-based information should be periodically shared with clinician nurses. Current trends emphasize not only cancer prevention but also holistic approaches to health promotion and patient empowerment. Patients'self-management should be encouraged, and education and counseling should be organized to strengthen their quality of life and psychosocial health at home. Interventions should be planned to increase the health literacy of patients with gynecologic cancer by enabling them to access accurate information, and make decisions about their health. In addition, clinician nurses should be able to recognize the current and basic needs in the field by following nursing research and incorporate them into their interventions. These practices may improve the quality of care for cancer patients by encouraging nurses to take a more active clinical role.

Implications for research: This study showed that nursing studies on gynecological cancers often focus on common cancers, such as cervical cancer, and routine screening programs. Future studies should not neglect the needs of women diagnosed with other gynecological cancers such as endometrial and ovarian cancer. Due to the mostly focused cancer prevention process, which presents "cervical cancer, cancer screening, women's health, breast cancer, genetic counselling, and genetics" as advanced knowledge in the nursing science, there is a need to conduct studies that examine which nursing interventions could promote and rehabilitate the health of women with gynecological cancers. It is also important to have a holistic nursing approach in the studies, which addresses not only physical but also psycho-social domains of their health. Because of this, some topics could be presented more, such as long-term survivorship care and the intersection of mental health with gynecological cancer outcomes. Due to the ongoing development of the "oncology nursing" concept, there is a need for further studies which promote this specialized concept. It is also suggested to adopt an approach as a researcher that catches the current trends and needs of women. Due to suggestions that some areas are foundational in gynecological nursing research but with limited knowledge about them in nursing science, there is a need to conduct studies related to quality of life, chemotherapy, anxiety, gynecological cancer, ovarian cancer, and oncology nursing. Future bibliometric studies should integrate additional databases and consider multilingual searches to enhance comprehensiveness.

Implications for healthcare policy: Nursing policy-makers should prioritize the development of evidence-based policies that reflect these emerging trends. Policies should support nurses to expand their clinical knowledge, provide individualized and holistic care, and address emotional and social needs in addition to physical symptoms. In this framework, national guidelines should be developed and published, health professionals should be informed about current research results in the field, and supported in transferring research results into practice. In this direction, health policy makers, academics, and hospitals should work in cooperation. In-service trainings for nurses should be increased to provide treatment, rehabilitative and preventive approaches, as well as individual empowerment approaches to gynecological cancers. Strengthening these areas will improve patient care and ensure that women with gynecologic cancer receive comprehensive support throughout their cancer journey.

Implications for education: There is advanced knowledge about cervical cancer and its prevention and diagnosis, while foundational knowledge in gynecological cancer nursing was described as including quality of life, chemotherapy, anxiety, gynecological cancer, ovarian cancer, and oncology nursing. Nursing curriculum need to be organized to reflect the foundation and advanced knowledge integration in the program. It is also suggested to educate nurses to have a holistic approach during their care. Specialization in oncology nursing needs to be provided in the curriculum. Nursing students should have education such follow-up trends in the gyncecological cancer in nursing science such promote women's resilience to the process: coping stress, self-management, health literacy, etc. and such nursing care components as palliative care, cancer rehabilitation, etc.

Conclusion

The present study clarifies which nursing research topics are related to gynecological cancer research. This study showed that nursing studies on gynaecological cancers typically focus on common cancers such as cervical cancer and routine screening programmes. Although the general trend in cervical cancer screening publications in current nursing studies in the field is positive, research efforts for other gynaecological cancer prevention interventions are insufficient. Future studies should not neglect the needs of women diagnosed with gynaecological cancer such as endometrial and ovarian cancer. Therefore, future large-scale, cross-sectional population-based nursing research could address the gap and increase the recognition of gynaecological cancers that remain in the background. At the same time, preventive approaches to cancer have often been addressed in previous studies, and rehabilitation and health promotion have recently become more prominent. Nursing studies should focus more on supportive interventions for cancer symptoms and treatment side effects, including self-management, palliative care and cancer rehabilitation. Thus, it emphasizes the increasing importance of holistic empowerment in nursing as an essential approach to improve the well-being of women living with and surviving cancer. Finally, for all gynaecological cancers, this approach should be adopted to improve the quality of life of women and their families from diagnosis to death. This approach enables them to go through these processes optimally. It is also a remarkable point that nursing research can promote

healthcare policy. Therefore, there is a need to collaborate with researchers from regions with high gynecological cancer incidence, which may enhance research and care policies.

Ethics Committee Approval: Ethical approval was not required for this study, as it did not have any directly data from humans or animals.

Informed Consent: Since the study was conducted using open data, patient consent was not required.

Footnotes

Author Contributions: Concept - A.D.D., A.B., A.A.C., A.A.; Design - A.D.D., A.B., A.A.C., A.A.; Data Collection or Processing - A.D.D., A.B.; Analysis or Interpretation - A.D.D., A.B.; Literature Search - A.D.D., A.B., A.A.C., A.A.; Writing - A.D.D., A.B., A.A.C., A.A.

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ORIGINAL ARTICLE

Assessing the Validity and Reliability of a Turkish Version of an Evidence-based Practice Knowledge, Attitudes, Understanding, and Behavior Scale: A Methodological Study

Kanıta Dayalı Uygulama Bilgi, Tutum, Anlayış ve Davranış Ölçeğinin Türkçe Formunun Geçerlilik ve Güvenilirliğinin Değerlendirilmesi: Metodolojik Bir Çalışma

Seda Güney[1], Remziye Semerci[1], Özlem Akarsu[2]

[1]Department of Nursing, Koç University Facult of Nursing, İstanbul, Turkey
[2]Department of Department of Pediatric Nursing, İstanbul Medeniyet University Faculty of Health Sciences, İstanbul, Turkey

Abstract

Objective: This study aimed to adapt and validate a scale measuring evidence-based practice (EBP) knowledge, attitudes, understanding, and behavior for Turkish health sciences students.

Method: This methodological study was conducted with 382 health sciences students between May and September 2024. The translation process was carried out using forward and back translations, followed by expert review. Content validity was evaluated by eight experts using the content validity index (CVI), and construct validity was assessed using exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). Reliability was assessed using internal consistency and split-half reliability.

Results: The scale demonstrated high content validity, with the item-level CVI scores ranging from 0.85 to 1.00 and the overall scale CVI of 0.90. EFA identified five factors explaining 66.26% of the total variance. CFA confirmed the factor structure, with fit indices (χ^2/df=2.4, RMSEA =0.061, CFI =0.918, TLI =0.911) meeting acceptable thresholds. The overall Cronbach's alpha was 0.888, indicating strong internal consistency. Subscales with Cronbach's alpha values ranging from 0.764 to 0.945 demonstrated good reliability.

Conclusion: The EBP scale was valid and reliable for assessing health sciences students' EBP and evidence-informed practice competencies in Turkish. This tool supports the development of evidence-informed care among health sciences students.

Keywords: Evidence-based practice, evidence-informed practice, psychometric validation, students

Öz

Amaç: Bu çalışmanın amacı, kanıta dayalı uygulama bilgi, tutum, anlayış ve davranış ölçeğinin Türkçe dilinde sağlık bilimleri öğrencileri için uyarlanması ve geçerlilik ve güvenirliğinin test edilmesidir.

Yöntem: Bu metodolojik çalışma Mayıs-Eylül 2024 tarihleri arasında 382 sağlık bilimleri öğrencisi ile yürütülmüştür. Çeviri süreci, çeviri ve tekrar çeviriler ve ardından uzman incelemeleri ile sağlanmıştır. İçerik geçerliliği sekiz uzman tarafından kapsam geçerlilik indeksi (CVI) kullanılarak değerlendirilirken, yapı geçerliliği açıklayıcı (AFA) ve doğrulayıcı faktör analizleri (DFA) ile değerlendirilmiştir. Güvenilirlik, iç tutarlılık ve yarıya bölme testleri kullanılarak ölçülmüştür.

Bulgular: Ölçek, 0,85 ile 1,00 arasında değişen madde düzeyi CVI puanları ve 0,90 ölçek düzeyi CVI ile yüksek kapsam geçerliliğine sahiptir. AFA, toplam varyansın %66,26'sını açıklayan beş faktör belirlemiştir. DFA faktör yapısını doğrulamış ve uyum indeksleri (χ^2/df=2,4, RMSEA =0,061, CFI =0,918, TLI =0,911) kabul edilebilir eşikleri karşılamıştır. Genel Cronbach alfa değeri 0,888 olup güçlü bir iç tutarlılığa işaret etmektedir. Alt ölçekler, 0,764 ile 0,945 arasında değişen Cronbach alfa değerleri ile yüksek güvenilirlik göstermiştir.

Sonuç: Kanıta dayalı uygulama ölçeğinin Türkçe uyarlaması, sağlık bilimleri öğrencilerinin kanıta dayalı uygulama yeterliliklerini değerlendirmek için geçerli ve güvenilir bir ölçektir. Bu araç, sağlık bilimleri öğrencileri arasında kanıta dayalı uygulamaların geliştirilmesini desteklemektedir.

Anahtar Kelimeler: Kanıta dayalı uygulama, kanıt bilgilendirilmiş uygulama, psikometrik analiz, öğrenciler

Corresponding Author:
Seda Güney, seguney@ku.edu.tr

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Introduction

Evidence-based practice (EBP) and evidence-informed practice (EIP) are fundamental frameworks in modern healthcare, emphasizing the integration of research evidence, clinical expertise, and patient preferences to guide decision-making (1,2). EBP involves systematically evaluating and synthesizing high-quality research to promote patient safety and improve care quality (3). Despite its widespread acceptance, the implementation of EBP often faces challenges, including contextual constraints and criticism of its mechanistic application (4). EIP has emerged as a complementary approach to address these limitations, offering a more flexible and adaptive framework for applying evidence in clinical practice (1). EBP and EIP emphasize the critical role of patient values and preferences in ensuring effective and patient-centered decision-making (5).

To promote the integration of EBP and EIP in healthcare settings, various models and frameworks have been developed to enhance outcomes for individuals, groups, and communities (1). However, the success of these models relies heavily on the competence of healthcare practitioners, underscoring the importance of equipping healthcare students with the necessary skills during their undergraduate education. Healthcare students, as future practitioners, play a pivotal role in sustaining and advancing evidence-based care. Their education provides a foundation for developing the critical thinking, decision-making, and problem-solving skills required to navigate the complexities of clinical environments and contribute to continuous improvement within healthcare systems (6,7).

Integrating EBP and EIP into undergraduate curricula is critical to preparing students for real-world challenges. As Patelarou et al. (8) noted, embedding these concepts into educational programs equips students to deliver high-quality, evidence-informed care. However, validated tools to assess EBP and EIP competencies among health sciences students are scarce, particularly in culturally diverse and non-Western settings such as Turkey (9). Existing instruments predominantly focus on nursing students (10,11) and social workers (12), often neglecting the broader applicability of EIP or failing to capture its nuances. These limitations hinder efforts to evaluate the effectiveness of EBP and EIP education and highlight the need for culturally appropriate tools to measure student competencies accurately and inform curriculum development.

Main Points

- Measuring evidence-based practice (EBP) knowledge, attitudes, and behaviors is essential for understanding how well healthcare students are prepared to use evidence in real clinical settings.
- Adapted tools are essential to support and enhance EBP in nursing education.
- The validated Turkish EBP scale provides a reliable measure of students' EBP and EIP competencies, helping strengthen evidence-informed care in health sciences education.

Health sciences students, including those studying nursing, midwifery, physiotherapy, and other allied health disciplines, face unique challenges in developing competencies in EBP and EIP because of the diverse and complex nature of their clinical roles (9). Their ability to integrate evidence into practice is essential for addressing the multifaceted needs of patients and advancing the quality of care. Assessing their knowledge, attitudes, understanding, and behaviors toward EBP and EIP provides critical insights into the effectiveness of educational programs, enabling educators to refine curricula and enhance student preparation. To address these gaps, this study aims to adapt and validate the EBP knowledge, attitudes, understanding, and behavior scale for use among Turkish health sciences students.

Material and Method

Design

This study employed a methodological design to adapt and evaluate the psychometric properties of the EBP knowledge, attitudes, understanding, and behavior scale for use with Turkish health sciences students.

Study Sample and Data Collection

Health sciences students currently enrolled in courses at one state university were asked to participate in the study. Data collection was conducted between May and September 2024. The total number of health sciences students at that university was 1.670. The inclusion criteria required students start clinical internships of at least one semester in one health sciences department. Exclusion criteria were not being enrolled as a student in a health sciences program; lack of proficiency in Turkish; inability or unwillingness to provide informed consent; and inability to complete the questionnaire within the designated time frame due to illness or other commitments. According to guidelines in the literature, a sample size of 3 to 10 participants per item is commonly recommended for scale validation (13,14). With 35 items in the scale used in this study, the recommended sample size typically ranges from 105 to 350 participants. To enhance the study's statistical power and to account for any potential data loss, 382 students were ultimately recruited. The following steps were followed for the validity and reliability of the scale;

Translation equivalence study: Translation was performed by an expert in nursing and linguistics (e.g., a faculty member proficient in both English and Turkish, with a background in English language and literature or English language teaching). The translation from English into Turkish was conducted and then back-translated into English by an expert proficient in both languages and their cultures. The back-translated scale was compared with the original scale to identify any changes in the meaning of the expressions. Following the comparison, the Turkish version was finalized.

Validity Analysis

Content validity: At this stage, expert opinions were sought to determine whether the questions in the scale are suitable for the measurement purpose, represent the intended area, are relevant to the adopted problem, and contain concepts outside the field. For this purpose, opinions from eight experts specializing in health sciences, including nurses, physicians, psychologists, and social workers, were solicited, and the items were evaluated using a 4-point rating scale. Then, the items were adjusted based on experts' opinions and suggestions.

Construct validity evaluates how accurately a tool measures a difficult-to-observe abstract concept, behavior, or dimension. Exploratory and confirmatory factor analyses were used to evaluate construct validity.

Reliability Analysis

Internal consistency: The internal consistency test assesses whether all aspects of the instrument consistently measure the same construct. It is necessary to determine whether each scale item measures the same underlying attitude. Cronbach's alpha was used to assess internal consistency.

The split-half test is used in statistics and psychometrics to assess the reliability of a scale. The goal is to determine whether the different parts of the test reliably measure the same construct. If the two halves are highly correlated, the test is considered to have good internal consistency, meaning that the items are homogeneous.

Data Collection Tools

The socio-demographic characteristics information form was used to collect participants' ages, genders, departments, and their knowledge of and training in EBP.

EBP knowledge, attitudes, understanding, and behaviors scale: The knowledge, attitudes, understanding, and behaviors scale for EBP and EIP, created by Kumah et al. (9), includes 35 items-20 focused on EBP and 15 on EIP. Responses are given on a 5-point Likert scale, indicating that higher scores reflect better knowledge and understanding, and more favorable attitudes and behaviors toward both practices. In the original study, Cronbach's alpha values for understanding, behavior, and attitudes toward EBP were above 0.7. However, the "knowledge" and "self-perceived application and use" domains showed lower reliability, with alpha values of 0.5 and 0.6, respectively.

Statistical Analysis

IBM SPSS statistics for Windows, version 28.0, and AMOS, version 26.0, were used for data analysis. The Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity were applied to assess the suitability of the data for extracting significant factors. Reliability was assessed using split-half testing, item-total correlation, and internal consistency. Exploratory factor analysis (EFA) was conducted, followed by confirmatory factor analysis (CFA), to evaluate how well the items and subscales aligned with the scale's original structure.

Procedures

The participants were provided information about the purpose of the study, inclusion criteria, and benefits of participation. Interested students were asked in person to sign the informed consent form to participate in the study and to complete self-administered questionnaires. The survey was conducted at the university where the health sciences and nursing students were enrolled. Participants were assured of the anonymity and confidentiality of their responses. Completion of the questionnaire took approximately 15 minutes.

Ethical Considerations

Before conducting the study, approval from the Ethical Review Board of Koç University (approval number: 2024.157.IRB3.064, date: 18.04.2024) was obtained. Permission was obtained from the developers of the original instrument. Students were acknowledged for their participation in the study and reassured that they could refuse to participate or to withdraw from the study at any stage.

Results

Sample Characteristics

A total of 382 students from the departments of nursing (n=221), social work (n=9), nutrition (n=99), and audiology (n=53) participated in the study. Their mean age was 21.20±1.39 years; most were in the 3rd or 4th year of their departments. Most of them have heard the term "evidence-based" (n=187), but they have reported lacking evidence-based information or training (n=361) (Table 1).

Results of Validity Analysis

Translation Process

Adapting the EBP and EIP scale involved revisions to ensure cultural relevance and applicability to Turkish health sciences students. The original scale consisted of two sections, EBP and EIP, with five subscales in each section. However, the adapted Turkish version retained two sections (EBP and EIP) but was reorganized into five subscales. The EBP section was structured into three subscales: understanding, attitude, and behavior, while the EIP section was reduced to two subscales: knowledge and self-perceived application and use. This restructuring was informed by factor analysis and aimed to enhance the scale's clarity, cultural relevance, and psychometric robustness for use among Turkish health sciences students. This reorganization was necessary to address overlapping or redundant items and to improve the scale's clarity and interpretability. Several items were revised or rephrased to better reflect the Turkish context. Items such as "I do not perform EBP because I do not believe in it" were retained under the "Attitude" sub-dimension to capture belief barriers.

Table 1.
Socio-demographic Characteristics

Variables	Number	%
Gender		
Women	303	79.3
Men	79	20.7
Age		
18-25 years Mean: 21.20±1.39	382	100
Department of students		
Nursing	221	57.9
Social work	9	2.4
Nutrition	99	25.9
Audiology	53	13.9
Grade		
1	69	18.1
2	70	18.3
3	147	38.5
4	96	25.1
Heard of evidence-based term		
Yes	187	49
No	195	51
Having training in evidence-based practice		
Yes	21	5.5
No	361	94.5

To improve the organization of the scale, the items were made more comprehensible by changing the phrasing from "does not contain" to I don't think it contains. In contrast, specific items were designated as reverse-coded to enhance reliability. Items with ambiguous or culturally irrelevant phrasing were revised, and examples tailored to the Turkish healthcare setting were added for clarity. The adapted scale consists of 32 items across five sub-dimensions, ensuring a more concise, culturally relevant, and psychometrically valid and reliable tool for assessing evidence-based and EIP competencies among Turkish health sciences students. This rigorous adaptation process underscores the importance of ensuring linguistic and conceptual clarity when developing instruments for use in diverse educational and healthcare settings.

Content Validity

The scale items were sent to seven nursing experts to review the scale's content validity. The item- and scale-level content validity indices were tested. The item-level content validity index (I-CVI) ranged from 0.85 to 1.00, reflecting a strong consensus among the experts. The overall scale CVI (S-CVI) was 0.90, demonstrating a high level of agreement among their evaluations.

Construct Validity

The KMO and Bartlett's tests were performed before EFA and CFA. The KMO value was 0.917, indicating that the sample size was appropriate for this analysis. Bartlett's test of sphericity was statistically significant (χ^2=9068.134, p<0.001), indicating that the correlation matrix was not an identity matrix and that factor analysis was appropriate for this sample (Table 2).

Five dimensions of the scale were identified by EFA. Item loadings were analyzed before and after varimax rotation using principal component analysis as the data extraction method. The identified structure explained 66.26% of the total variance. After EFA, the model fit of the item-factor relationship was tested using CFA, as illustrated in Figure 1. The fit indices [chi-square statistic, goodness-of-fit index (GFI), root mean square error of approximation (RMSEA), comparative fit index (CFI), and normed fit index] were used to determine the model's adequacy in this study. During the process, one item (EIP item 11) was excluded based on regression weights and a statistical significance threshold of p<0.05. After this modification, the model fit indices were acceptable and statistically significant (χ^2=1240.833; df=517; p<0.001). The fit indices are detailed in Table 3.

Reliability Analysis

The scale's reliability was assessed using item-total correlations and Cronbach's alpha. The overall Cronbach's alpha of the scale was 0.888. Detailed results for the total scale and its sub-dimensions, based on Cronbach's alpha, are provided in Table 4. Additionally, Pearson correlation analysis was performed to examine the relationships between individual item scores and the total scale score, and the findings were presented in the same table.

A split-half reliability test was conducted to evaluate the data further. The results, summarized in Table 4, demonstrated a strong correlation between the mean scores of the two halves (r=0.551). This suggests good internal consistency, indicating that the test items are homogeneous, as shown in Table 5.

Discussion

This study aimed to adapt and validate the EBP knowledge, attitude, understanding, and behavior scale for use among Turkish health sciences students. Adapting the scale required revisions to achieve cultural relevance and linguistic clarity for Turkish health sciences students, particularly regarding content validity. Expert evaluations and feedback were critical in ensuring that the adapted scale appropriately measured the intended constructs. The original scale's two sections, EBP and EIP, each comprising five subscales, were reorganized into five subscales based on factor analysis. This restructuring addressed overlapping and redundant items, improving both clarity and interpretability. The EBP section was reduced to three subscales: understanding, attitude, and behavior, while the EIP section was refined into two subscales: knowledge and self-perceived application and use. Some items were revised to better align with the cultural and professional realities of Turkish healthcare. These results contributed to the development of a valid, reliable, and culturally adapted instrument that reflects the competencies required for EBP

Table 2.
Results of the EFA

	Factor 1 knowledge	Factor 2 behavior	Factor 3 attitude	Factor 4 understanding	Factor 5 self-perceived application and use
Scale items	**Item loadings**				
KTU 1	0.744				
KTU 2	0.814				
KTU 3	0.840				
KTU 4	0.843				
KTU 5	0.844				
KTU 6	0.797				
KTU 7	0.822				
KTU 8	0.852				
KTU 9	0.784				
KTU 10	0.846				
KTU 11	0.424				
KDU 14		0.727			
KDU 15		0.829			
KDU 16		0.851			
KDU 17		0.841			
KDU 18		0.794			
KDU 19		0.577			
KDU 20		0.754			
KDU 5			0.721		
KDU 10			0.776		
KDU 11			0.796		
KDU 12			0.826		
KDU 13			0.819		
KDU 1				0.719	
KDU 2				0.637	
KDU 3				0.735	
KDU 4				0.703	
KDU 6				0.599	
KDU 7				0.724	
KDU 8				0.603	
KDU 9				0.727	
KTU 13					0.902
KTU 14					0.918
KTU 15					0.835
Variance cumulative	66.26%				
KMO test	0.917				
Bartlett's test	9068.134; <0.000				

Extraction method=principal component analysis, rotation method=Varimax
KDU-EBP=evidence-based practice, KTU-EIP=evidence-informed practice, KMO=Kaiser-Meyer-Olkin, EFA=exploratory factor analysis

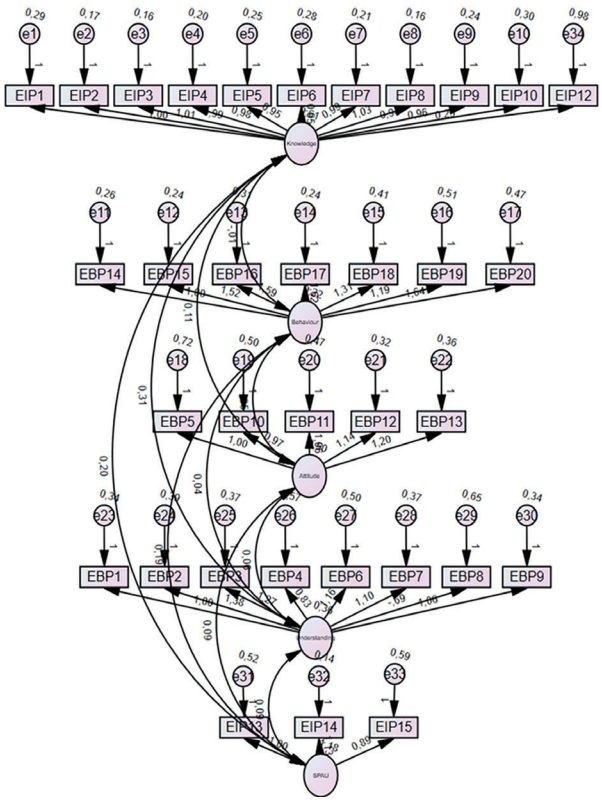

Figure 1.
Path Diagram and Item Loads for the Scale
EIP=evidence-informed practice, EBP=evidence-based practice

and EIP in Turkish. A critical component of this adaptation was the assessment of content validity, which ensured that the scale items were relevant and appropriate for the intended construct and target population (15). The results of this study demonstrated extremely high content validity, with the I-CVI ranging from 0.85 to 1.00 and the S-CVI reaching 0.90. These results indicate that the panel of eight experts involved in the evaluation process judged the scale items to be highly relevant and appropriate. The I-CVI scores reflect a strong consensus among the experts on the clarity and appropriateness of the individual items (16). Moreover, the S-CVI underscores the overall consistency and comprehensiveness of the scale (15). These high scores confirm the scale's relevance to its intended purpose and ensure it effectively captures the constructs of EBP and EIP competencies in the context of health sciences education in Turkey. High content validity indices are crucial in scale development as they ensure that items are relevant to the measured construct and appropriate for the target population. According to Polit and Beck (15), an I-CVI of 0.78 or above and an S-CVI of 0.80 or above are generally recognized as strong indicators of content validity. The results of this study showed that the scale's content and its suitability for assessing EBP and EIP were appropriate (15).

The construct validity of the Turkish version of the EBP knowledge, attitude, understanding, and behavior scale was comprehensively assessed with both EFA and CFA. Construct validity is a critical psychometric property that enables a scale to accurately measure the theoretical construct it aims to assess (17). The results of this study provide robust evidence supporting the construct validity of the adapted scale. The KMO value of 0.917 indicates that the sample size is more than adequate for EFA. KMO values above 0.90 are considered "excellent" and indicate excellent sampling adequacy (18). This high KMO value indicates that the data are suitable for factor analysis, and that the inter-item correlations are strong enough to justify further statistical testing. In addition, Bartlett's test of sphericity (χ^2=9068.134, p<0.001) confirmed the presence of significant correlations among items, further validating the appropriateness of conducting EFA (19). These results provide a basis for the validity of the factor structure. The EFA results identified five dimensions that together explained 66.26% of the total variance in the scale. This explained variance is considered in social science research, where values between 50% and 75% are typically acceptable (20). The explained variance (66.26%) also supports the scale's ability to measure the intended construct effectively. Streiner et al. (13) emphasize that a high percentage of explained variance indicates that the identified factors represent a significant portion of the measured construct. The use of principal component analysis, with varimax rotation as an extraction method, is consistent with best practices for identifying the underlying structure of a scale (21). Varimax rotation is particularly effective for obtaining a transparent and interpretable factor structure by maximizing the variance of factor loadings across items. This result supports the appropriateness of the scale to assess EBP competencies in the Turkish context.

The CFA results revealed strong construct validity of the EBP knowledge, attitude, understanding, and behavior scale and supported the factor structure obtained from EFA. Model fit indices, including the chi-square/df ratio, RMSEA, and incremental indices (CFI, TLI, incremental fit index), confirmed the adequacy of the model, with values meeting acceptable thresholds for good fit (22). One item (EIP item 11) was removed from the process due to a low regression weight and a lack of statistical significance, a common step in scale validation to improve overall model fit and reliability. Removing this item improved the model's performance and

Table 3.
Fit Indices Obtained from CFA for the Scale

	X^2	DF[a]	X^2/DF	RMSEA[b]	GFI[c]	CFI[d]	IFI[e]	RFI[f]	NFI[g]	TLI[h]
Model	**1240.833**	**517**	**2.400**	**0.061**	**0.837**	**0.918**	**0.918**	**0.856**	**0.868**	**0.911**

CFA=confirmatory factor analysis, X^2=chi-squared test, [a]=degree of freedom, [b]=root mean square error of approximation, [c]=goodness-of-fit index, [d]=comparative fit index, [e]=incremental fit index, [f]=relative fit index, [g]=normed fit index, [h]=Trucker-Lewis index

Table 4.
Results of the Reliability Analyses of the Scale and Correlations of the Item-total Item Score

Overall scale and sub-domains	Cronbach alpha	Item-total item correlations	Mean ± SD
Scale	0.888	0.073-0.689	107.62±15.18
1. Knowledge	0.945	0.203-0.864	42.63±8.07
2. Behavior	0.895	0.583-0.781	11.84±4.917
3. Attitude	0.858	0.586-0.739	17.36±4.11
4. Understanding	0.777	0.448-0.736	28.19±4.65
5. Self-perceived application and use	0.890	0.732-0.854	7.58±3.46

SD=standard deviation

Table 5.
Split-half Test of the Scale

	Scale score mean		**Analysis results**		
	Part 1 Mean ± SD Cronbach's alpha: 0.764	**Part 2 Mean ± SD Cronbach's alpha: 0.887**	**Correlation between parts**	**Spearman-Brown coefficient**	**Guttman split-half coefficient**
Scale	54.39±7.92	53.23±9.3	0.551	0.711	0.705

SD=standard deviation

ensured the retained items accurately represented the intended constructs. A chi-square/df ratio of 2.4 and an RMSEA of 0.061 indicate that the model fits the data well and reflects minimal approximation error (23). Furthermore, fit indices such as CFI and TLI exceeded 0.90, confirming that the scale could effectively model the relationships between its dimensions (24). Although the GFI value is slightly below the recommended threshold, it is supported by other fit indices, emphasizing the importance of assessing model fit holistically rather than relying on a single metric (25). These results align with psychometric literature emphasizing the use of multiple indices to validate factor models. The results suggest that the Turkish version of the scale is valid and reliable for assessing the EBP competencies of health sciences students.

Reliability analysis of the Turkish version of the EBP knowledge, attitude, understanding, and behavior scale demonstrated strong internal consistency. Cronbach's alpha for the overall scale was 0.888. Since values above 0.7 are generally considered acceptable, and values close to 0.9 indicate excellent reliability (26), this value indicates satisfactory internal consistency. This result indicates that the scale items consistently measure the same underlying construct and are reliable for assessing EBP competencies. The scale's subscales also showed good reliability, with Cronbach's alpha coefficients for the two halves of the split-half analysis ranging from 0.764 to 0.887. The split-half reliability test confirmed internal consistency with a Spearman-Brown coefficient of 0.711 and a Guttman split-half coefficient of 0.705. Both coefficients indicate an acceptable level of reliability. Values above 0.7 indicate good consistency between the two halves of the scale (27). The moderate correlation between the two halves (r=0.551) indicates reliability of measurement across the scale's parts and supports the scale's internal consistency. Assessment of item-total correlations through Pearson correlation analysis confirmed that each item contributed significantly to the overall scale score (28). The strong item-total correlations indicate that each item is in good agreement with the overall construct, further strengthening the scale's reliability (29). Item homogeneity is crucial to ensuring that the scale consistently measures EBP competencies. These results are consistent with the reliability standards in psychometric research and align with findings from similar studies of EBP scales (9). In addition, the use of multiple methods, including Cronbach's alpha, split-half reliability, and item-total correlations, provides a comprehensive assessment of scale reliability and aligns with best practices in scale validation (30).

Study Limitations

First, the sample was limited to students at a single public university, which may limit generalizability. Second, the study focused on health sciences students and did not assess the applicability of the scale to other health disciplines, such as medicine or pharmacy. Future research should investigate the validity and reliability of the scale across diverse populations and settings to broaden its applicability. Lastly, although the rigorous adaptation process addressed linguistic and cultural differences, the exclusion of certain items and the reorganization of subscales may have altered the scale's alignment with the original version.

Conclusion

In this study, the EBP knowledge, attitude, understanding, and behavior scale was found to be valid and reliable for health sciences students in Turkey. The adapted scale demonstrated strong psychometric properties, including high content validity, robust construct validity, and excellent reliability. EFA and CFA supported the multidimensional structure of the scale, and internal consistency tests confirmed its reliability for assessing evidence-based competencies. The scale provides a valuable tool for assessing and improving EBP education in Turkey by ensuring cultural relevance and linguistic accuracy. It is recommended that the adapted EBP scale be integrated into health sciences curricula to assess and enhance students' competencies in EBP.

Ethics Committee Approval: Before conducting the study, approval from the Ethical Review Board of Koç University (approval number 2024.157.IRB3.064, date: 18.04.2024) was obtained.

Informed Consent: Interested students were asked in person to sign the informed consent form to participate in the study and to complete self-administered questionnaires.

Footnotes

Author Contributions: Concept - S.G., R.S., Ö.A.; Design - S.G., R.S., Ö.A.; Data Collection or Processing - Ö.A.; Analysis or Interpretation - S.G., R.S.; Literature Search - S.G., R.S.; Writing - S.G., R.S., Ö.A.

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ERRATUM

DOI: 10.4274/MNM.2024.24204

Alexis O, Cookie J, Jennings S, Worsley AJ, Basupang NB. Empowering Nursing Students: A Cross-sectional Study. Mediterr Nurs Midwifery 2025; 5(2): 94-101.

The title was changed. The wrong section is shown below:

Empowering Nursing Students: A Cross-sectional Study

The title of the article has been corrected as follows:

Empowering Nursing Students

2025 Referee Index - 2025 Hakem Dizini

Afra Çalık
Anita Karaca
Arzu Abiç
Arzu Yüksel
Aslı Er Korucu
Aslıhan Aksu
Atiye Aydın
Ayla Ünsal
Ayşe Ay
Ayşe Aydındoğmuş
Ayşe Şenoğlu
Ayşe Ülgen
Ayşegül Şimşek
Ayşegül Yılmaz
Aysel İncedere
Azime Karakoç Kumsar
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Buse Erguvan
Cansu Akdağ Topal
Cemile Savcı
Çiğdem Sarı Öztürk
Derya Atik
Derya Şimşekli
Derya Tanrıverdi
Dilay Necipoğlu
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Kemal Elyeli
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Kıvan Çevik Kaya
Lale Yacan
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Merve Mert Karadaş
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Zümrüt Yılar Erkek