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Original Articles

TURKISH JOURNAL OF CARDIOVASCULAR NURSING

Official journal of the TURKISH SOCIETY OF CARDIOLOGY

Turkish Journal of Cardiovascular Nursing

Quality of Life and Influencing Factors in Elderly Cardiac Surgery Patients: A Systematic Review

Yaşlı Kardiyak Cerrahi Hastalarında Yaşam Kalitesi ve Etkileyen Faktörler: Sistematik Derleme

ABSTRACT

Objective: This study systematically reviewed research examining the quality of life and influencing factors in elderly patients undergoing cardiac surgery.

Method: This review was conducted in accordance with PRISMA guidelines. A literature search was performed using PubMed, Medline, Google Scholar, Ulakbim Turkish Medical Index, Cochrane Library, and Web of Science databases with the keywords: "cardiac surgery," "quality of life," "elderly," "older," and "geriatric." The review included studies published between 2015 and 2025 that investigated the quality of life of elderly patients undergoing cardiac surgery.

Results: Sixteen studies were included after full-text review. The majority of the studies (n = 7) were prospective cohort studies, while four were prospective randomized controlled trials. The remaining studies were comparative (n = 2), case-control (n = 1), descriptive (n = 1), and retrospective cohort (n = 1). The included studies comprised a total of 4,242 patients. The smallest sample size was 46, while the largest was 1,706.

Conclusion: The reviewed studies emphasize that quality of life improves in the postoperative period compared to the preoperative period. Furthermore, numerous factors have been shown to be associated with quality of life, including age, gender, frailty, chronic pain, medication use, cognitive status, education, and surgical technique or method.

Keywords: Cardiac surgery, elderly, nursing, quality of life, systematic review

ÖZET

Amaç: Bu çalışma kardiyak cerrahi geçiren yaşlı hastalarda yaşam kalitesini ve etkileyen faktörleri belirleyen araştırmaları sistematik olarak inceleme amacıyla yapıldı.

Yöntem: Bu çalışma, PRISMA kılavuzuna uygun olarak yürütüldü. Literatür taraması, PubMed, Medline, Google Scholar, Ulakbim Türk Tıp Dizini, Cochrane Library ve Web of Science veri tabanlarında "kalp cerrahisi", "kardiyak cerrahi", "yaşam kalitesi", "yaşlı", "cardiac surgery", "heart surgery", "quality of life", "elderly", "older", "geriatric" anahtar kelimeleri ile yapıldı. Sistematik derlemeye, kalp cerrahisi geçiren yaşlı hastalarda yaşam kalitesinin incelendiği 2015-2025 yılları arasında yayınlanan çalışmalar dahil edildi.

Bulgular: Çalışmaya tam metin incelemesi sonrasında 16 araştırma dahil edildi. Çalışmaların çoğunluğu (n = 7) prospektif kohort niteliğindeyken, dördü prospektif randomize kontrollü çalışmalardı. Geriye kalan çalışmalar karşılaştırmalı nitelikteydi (n = 2), vaka-kontrol (n = 1), tanımlayıcı (n = 1) ve retrospektif kohort (n = 1) idi. Dahil edilen çalışmalar toplam 4242 hastadan oluşuyordu. En küçük örneklem sayısı 46, en büyüğü 1706'dır.

Sonuç: İncelenen çalışmalarda elde edilen sonuçlar, yaşam kalitesinin ameliyat sonrası dönemde ameliyat öncesine kıyasla iyileştiğini vurgulamaktadır. Ayrıca yaşam kalitesi yaş, cinsiyet, kırılganlık, kronik ağrı, ilaç kullanımı, bilişsel durum, eğitim, cerrahi teknik/yöntem gibi birçok faktörle ilişkilendirilmiştir.

Anahtar Kelimeler: Kardiyak cerrahi, yaşlılık, hemşirelik, yaşam kalitesi, sistematik derleme

ORIGINAL ARTICLE
KLİNİK ÇALIŞMA

Introduction

An aging population is the most significant global demographic trend of this century.[1] It is projected that by 2050, the number of people over the age of 80 will reach or even exceed 400 million.[2] The World Health Organization (WHO, 2015) defines old age as

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beginning at 65 years, identifying this stage of life as one where disabilities and care needs increase.[3] There are several demographic classifications of old age in the literature: ages 65–74 are classified as Young (Early) Old Age, 75–84 as Middle Age, and 85 and older as Old Age.[4] According to data from the Turkish Statistical Institute (TURKSTAT) in 2020, the proportion of elderly individuals (65 years and older) reached 9.5%, totaling approximately 8 million people.[5] As the rate of population aging increases, it raises concerns about life expectancy, quality of life, and overall well-being. Aging is accompanied by numerous diseases, especially cardiovascular conditions, which may develop due to the weakening of vascular structures with age. This results in increased morbidity and mortality from cardiovascular diseases.[1,6]

According to TURKSTAT's 2019 statistics,[7] 39.1% of deaths from circulatory system diseases were caused by ischemic heart disease, 25.7% by other heart diseases, 22.2% by cerebrovascular disease, and 7.9% by hypertensive diseases. WHO's 2018 data indicate that the incidence of cardiovascular events—such as heart attacks, chest pain, and strokes—rises with age.[8] The prevalence is 1.3% among individuals aged 15 to 29 but increases to 18.8% among those aged 70 and older. Although cardiovascular diseases can be managed medically, they often progress to a point where surgical intervention becomes necessary.[9] In Europe, 40% of patients undergoing heart surgery are over 75 years old, and individuals over 80 years old constitute 9% of all cardiac surgery candidates. Patients with symptoms of heart disease may experience limitations in daily living activities, which can further deteriorate their medical condition. The primary goal of cardiac surgery is to improve prognosis or relieve symptoms. However, patient characteristics and risk factors present in the preoperative period may affect surgical outcomes, leading to reduced quality of life and higher morbidity and mortality.[10] Nevertheless, continuous advancements in surgical methods and techniques, myocardial protection strategies, and perioperative care practices in recent years have significantly and consistently reduced operative mortality rates. Therefore, despite the presence of risk factors in elderly patients, studies have shown that cardiac surgery can now be safely performed in patients aged 80 years and older.[2]

In the literature, health-related quality of life assessments in elderly patients are considered crucial alongside classical methods for evaluating major morbidity and mortality in the postoperative period. Preexisting deterioration in quality of life and adverse changes following cardiac surgery may contribute to the onset of functional dependence.[11] WHO defines quality of life as an individual's assessment of their life in the context of their culture, value systems, goals, hopes, interests, and standards. The concept includes multiple complex components such as physical and psychological health, social relationships, and interactions with the environment.[12] The literature shows that quality of life is influenced by a range of physical and psychological factors. In the physical dimension, elements such as housing, employment, income, general health status, access to health services, working conditions, nutrition, and education play a critical role. In the psychological dimension, family relationships, social support, and stress levels are among the key influencing factors.[12] Additionally, individual patient characteristics are among the most significant determinants of quality of life. Considering that the impact of surgery extends beyond biological and clinical outcomes, a more comprehensive assessment that incorporates physical, psychological, and social parameters is necessary.[13] Patient individuality is central in determining quality of life. It is imperative to deliver holistic care that prioritizes quality of life throughout the entire surgical process, including the preparatory phase. This requires the use of valid and reliable assessment tools to identify patient-centered factors. Beyond morbidity and mortality outcomes, evaluating quality of life is essential to guide patient-centered clinical decision-making. Such evaluations help predict treatment effectiveness and improve care outcomes.[13,14]

MAIN POINTS

- The quality of life of elderly patients improves after cardiac surgery compared to the preoperative period.
- In addition to individual factors such as age and gender, preoperative frailty, cognitive status, and the surgical technique or method used also influence patients' quality of life.

Although numerous studies and systematic reviews/meta-analyses have addressed cardiac surgery and quality of life, no systematic review has specifically focused on elderly patients. Therefore, this study aimed to systematically review the literature on quality of life and its influencing factors in elderly patients undergoing cardiac surgery.

Methods

Information Source and Search Strategy

This study was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Figure 1) and structured according to the PICOS framework (P: Participants; I: Interventions; C: Comparators; O: Outcomes; S: Study designs) (Table 1). A comprehensive literature search was carried out using multiple databases, including PubMed, Medline, Google Scholar, Ulakbilim Turkish Medical Directory, Cochrane Library, and Web of Science. The search strategy involved identifying studies published from 2015 to 2025 using combinations of keywords related to cardiac surgery, heart surgery, quality of life, elderly patients, and geriatric individuals.

Eligibility Criteria

A comprehensive review of the existing literature was performed to identify studies published between 2015 and 2025 that examined the quality of life in elderly patients undergoing open or minimally invasive cardiac surgery. According to the World Health Organization, individuals over the age of 65 are classified as elderly. Therefore, studies with a sample group reporting a mean age of 65 years or older were included in this systematic review. Furthermore, only studies assessed to be of medium or high quality were incorporated.

Exclusion Criteria

Studies were excluded if they involved interventional procedures other than cardiac surgery; included a sample with patients aged 65 years or younger; were not written in English or Turkish; were book chapters or oral reports; did not directly address the study topic; lacked full-text availability; or were determined to be of low quality.

Study Selection, Data Extraction, and Quality Assessment

All abstracts identified through the keyword-based literature search were reviewed independently by two researchers. Subsequently, full-text articles were independently assessed to determine compliance with inclusion criteria. After the initial screening, a second round of review was conducted on a different day to ensure researcher focus and consistency. An additional scan was also performed. Reference lists of all included studies were examined to identify further relevant publications. Data were extracted independently by two researchers. The quality of each study was assessed using a tool adapted by Baig et al.[15] for evaluating quality of life studies in cardiac surgery. A checklist of 10 criteria (Table 2) was used to evaluate each study. If a study did not meet a criterion, it received 0 points; if it met a criterion, it received 1 point. Articles scoring 8 or more points were considered high quality, while those scoring 5 points or fewer were categorized as low quality.[16]

Data Analysis and Evaluation

As this study did not involve any specific analytical methods, the data were evaluated manually.

Research Ethics

This study did not involve human participants. Since the data were collected from open-access scientific databases, approval from an ethics committee was not required.

Results

Study Selection

This section presents the descriptive information and general findings of the studies included in the systematic review. The database search initially identified 606 studies. After abstract screening and the removal of duplicates and irrelevant articles, 106 full-text articles were reviewed in detail. Following this, two additional articles (from additional screening) were added as a result of repeated reviews conducted on a separate day when both researchers were highly focused. After a comprehensive evaluation of the full texts, 16 articles were deemed suitable for inclusion in the study. The article selection process is shown in the PRISMA flow diagram (Figure 1).

General Characteristics of Included Studies

The studies included in the review were published between 2015 and 2025. Detailed information is provided in Appendix 1. The study samples consisted of patients over the age of 65 who underwent open or minimally invasive cardiac surgery. The majority of the studies (n = 7) were prospective cohort studies, while four were prospective randomized controlled trials. The remaining studies included comparative (n = 2), case-control (n = 1), descriptive (n = 1), and retrospective cohort (n = 1) designs. The 16 included studies collectively involved a total of 4,242 patients. The smallest sample size was 46,[17] and the largest was 1,706 (Appendix 1).[18]

Quality Assessment Results

The quality assessment was conducted based on the criteria established by Baig et al.,[15] as summarized in Table 2. Each article received a score ranging from 0 to 10, with 10 representing the highest possible score. All included studies scored 5 or higher, indicating moderate or high quality. Of these, 13 studies scored 8 or above and were considered to be of high quality.

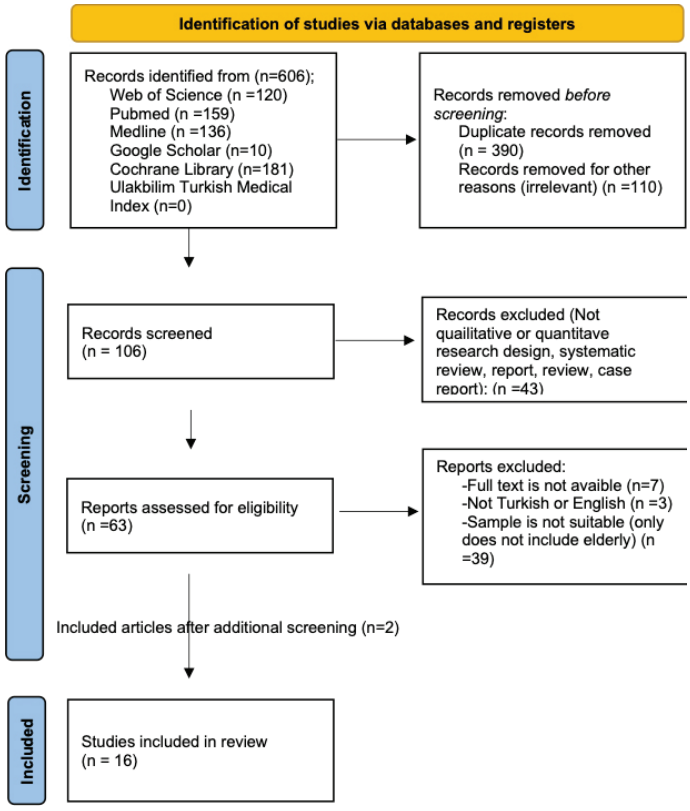

Figure 1. PRISMA flow diagram.

Table 1. PICOS elements for the review protocol

Element	Reviewed
Participants	Patients over 65 years of age who underwent cardiac surgery
Interventions	Cardiac surgical interventions (e.g., open surgery, minimally invasive surgery, TAVI, cognitive training, preoperative assessment)
Comparators	Comparisons between age groups (e.g., frail vs. non-frail elderly) Different surgical methods (e.g., on-pump vs. off-pump, TAVI vs. open surgery) Intervention group vs. non-intervention group
Outcomes	Quality of life or factors affecting quality of life
Study design	Prospective cohort, randomized controlled trials, comparative, case-control, descriptive, and retrospective cohort studies

PICOS, Population, intervention, comparator, outcome; TAVI, Transcatheter aortic valve implantation.

Quality of Life Scales Used

Six different quality of life measurement tools were employed across the 16 studies reviewed. The majority of the studies (n = 9) used the SF-36 as the primary quality of life measurement tool. Additionally, the SF-12, EQ-5D, and Kansas City Cardiomyopathy Questionnaire (KCCQ-OS) were also utilized.

Table 2. Scoring Criteria Adapted for Cardiac Surgery by Baig et al.[15] in 2013 to Assess the Quality of Quality-of-Life–Related Studies

Variables
1. Are socio-demographic and medical data defined (e.g., age, race, etc.)?
2. Are inclusion and exclusion criteria clearly formulated?
3. Is the data collection process described (e.g., individual reporting, interview)?
4. Have results been compared between two or more groups (e.g., healthy population, different treatment groups, or age categories)?
5. Are participation and return rates of patient groups defined (e.g., 75% participation or follow-up)?
6. Is information provided about the patient/disease characteristics of responders and non-responders?
7. Has a standardized or validated quality-of-life questionnaire been used?
8. Does the study assess not only quality of life but also physical, psychological, and social impacts?
9. Are the mean, median, standard deviation, or percentage results of key outcome measures reported?
10. Were patients asked to sign a consent form before the study began?
Maximum score=10

In one study, quality of life was evaluated using the Barthel Index, Fillenbaum Instrumental Activities of Daily Living Scale, and Vitality Index (Appendix 1).[17]

Time to Assess Quality of Life

An examination of the quality-of-life assessment periods and postoperative follow-up durations revealed that follow-up ranged from 1 month to 8 years after surgery, in addition to preoperative evaluations. Six studies conducted multiple assessments at different postoperative intervals, presenting findings on the changes in patients' quality of life during those periods (Appendix 1)

Quality of Life Outcomes

Many studies reported changes in quality-of-life scale scores between baseline and postoperative follow-up periods. The studies included in this systematic review observed that elderly patients, who initially exhibited low quality of life prior to surgery, experienced improvement after surgical intervention. Detailed study information is provided in Appendix 1. Moreover, individual factors such as preoperative cognitive impairment, chronic pain, polypharmacy, frailty level, surgical technique or method, duration of postoperative follow-up (ranging from 1–3.6 months to 1 year or more), age, and gender were all found to influence quality of life outcomes.

Discussion

The objective of this study was to systematically review the literature on the quality of life and the factors influencing it in elderly patients undergoing cardiac surgery. The findings are discussed under the following headings.

Improvement in Quality of Life and Follow-up Period

One of the fundamental aims of cardiac surgery is not only to prolong survival but also to improve quality of life. In elderly individuals, the impact of cardiac surgery on life expectancy may be limited. Consequently, improvements in quality of life assume greater significance.[19] The literature consistently reports significant improvements in quality of life following cardiac surgery across age groups, primarily due to the alleviation of preoperative symptoms.[16] Similarly, in the elderly patients included in this systematic review, a meaningful improvement in quality of life was observed after surgery.

Postoperative quality of life in elderly individuals is a complex and dynamic process that requires a multidisciplinary approach. Physical and psychological recovery typically begins in the early postoperative period, with notable improvements often seen within the first three months. In studies conducted by Østergaard et al.[14] and Coelho et al.,[19] the most substantial improvements in physical health began around the third postoperative month and continued meaningfully through the twelfth month. Psychological recovery also became significant at the third month in both studies. However, poor preoperative mental health status and extended stays in the intensive care unit have been identified as significant barriers to psychological recovery. A decline in mental health was observed by the twelfth postoperative month in approximately one-fourth of patients, raising concerns about a potential association between cardiac surgery and cognitive impairments, such as dementia. In the literature, several factors—including frailty, polypharmacy, cognitive function, pain management, and the type of surgical procedure—are identified as major determinants of postoperative quality of life in elderly patients. Therefore, it is essential to plan individualized interventions based not only on chronological age but also on physiological reserve, cognitive capacity, and level of social support.[20,21] As emphasized by the World Health Organization, the development of person-centered care strategies is critical to enabling older adults to maintain active and healthy lives.[4] The studies reviewed in this context also demonstrate that these factors significantly influence quality of life.

Quality of Life Measurement Tools

Evaluating the impact of medical interventions on patients' health-related quality of life is now regarded as a fundamental component of contemporary patient-centered care. Quality of life, by reflecting an individual's physical, psychological, and social well-being in relation to their health status, offers a more comprehensive assessment that considers not only clinical outcomes but also personal experiences and overall life satisfaction.[14]

Cardiac surgery, particularly in older and medically complex patients, plays a crucial role in improving quality of life.[10] In this context, the use of reliable and valid measurement tools that focus on qualitative outcomes is of great importance for monitoring and evaluating quality of life in elderly individuals. Especially within care processes involving multidisciplinary teams, such tools provide valuable insights that can enhance clinical decision-making.

As observed in the reviewed studies, the SF-36 is commonly used to measure health-related quality of life. Both the SF-36 and its abbreviated version, the SF-12, are frequently favored in the literature because they comprehensively assess both physical and mental health dimensions.[1,14,19,20,22] These scales evaluate not only physical functionality but also psychological state, social role functioning, and overall health perception. In this regard, they serve as powerful tools for understanding the patient experience following cardiac surgery and for developing personalized care strategies. Moreover, the selection of quality of life measurement tools is crucial to the accuracy of results. Generic quality of life scales have been noted to fall short in capturing disease-specific characteristics, whereas heart-specific instruments, such as the Kansas City Cardiomyopathy Questionnaire (KCCQ), provide more precise and relevant measurements.[18]

Age and Gender

In the literature, cardiac surgery is often emphasized as being high risk for elderly individuals.[16] However, the studies reviewed report significant improvements in quality of life following surgery in patients aged 65 and older. Notably, similar improvements have also been observed in individuals aged 80 and above, underscoring the potential benefits of surgery for this age group. These findings support the view that advanced age alone does not constitute a barrier to surgery. With appropriate patient selection, elderly individuals can indeed benefit from cardiac surgery.

Gender is also considered an influential factor in quality of life outcomes, though findings on this topic are varied. In the study by Coelho et al.,[19] female patients showed less postoperative improvement in quality of life compared to male patients. In contrast, the study by Lauck et al.[18] on patients who underwent transcatheter aortic valve implantation (TAVI), a minimally invasive procedure, found that women experienced more sustained improvements in quality of life at both 30-day and 1-year follow-up. These results suggest that the impact of gender on quality of life may vary depending on the surgical method and individual patient characteristics.

Chronic Pain and Frailty

Chronic pain following cardiac surgery is one of the significant complications observed in 18% to 35% of patients and has negative effects on health-related quality of life.[23] Chronic pain is associated not only with physical immobility but also with anxiety, depression, and social isolation. In frail elderly individuals in particular, chronic pain contributes to reduced functional capacity.[23]

With the aging global population, there is a growing need to reassess operative risk predictions in cardiac surgery. Chronological age has long been recognized as a key variable in surgical risk assessments. However, in addition to age, other demographic factors and comorbidities also play a determining role in risk evaluation.[20]

In the study by Marshall et al.,[20] frailty levels were assessed, and no direct relationship between quality of life and chronological age was found. Patients who were younger but exhibited high levels of frailty had poorer recovery and quality of life outcomes compared to older patients who were not frail. This suggests that frailty may be a more significant determinant of postoperative recovery and quality of life than age alone. As a result, various tools are used to assess frailty and related factors during the preoperative period, helping healthcare professionals manage postoperative care. However, due to individual variability, these tools may not always yield accurate or sufficient information. One example is the EuroSCORE risk scoring system, a widely validated model that incorporates patient and operative variables, as well as cardiac function, across different populations.[20] While this tool is effective in many contexts, it may overestimate risk in physiologically healthy elderly patients and underestimate it in younger but frail individuals.[20] This makes the choice of scoring system critical.

In recent cardiac surgery literature, there has been increased emphasis on comprehensive physiological evaluations, especially regarding frailty. Frailty is characterized by a reduced physiological response to medical or surgical stressors and greater susceptibility to adverse outcomes. The frailty phenotype includes markers such as involuntary weight loss, fatigue, muscle weakness, low physical activity, and slow walking speed.[21]

Frailty directly affects both short- and medium-term postoperative outcomes, especially quality of life. Although its prevalence increases with age, frailty is not exclusive to older individuals and can also be observed in younger patients.[20] Therefore, adopting a holistic assessment approach that includes biological age indicators—such as frailty—is essential, rather than relying solely on chronological age-based models. Despite its significance, frailty is still not incorporated into current surgical risk scoring systems. However, studies indicate that frailty among individuals with heart disease is strongly associated with late-stage mortality.[21] This highlights the need for frailty assessment in the preoperative period as a key factor in predicting not only survival but also postoperative quality of life. In this context, frailty is closely linked to poor surgical outcomes and should be considered a critical risk factor during preoperative evaluations.[20,21]

Cognitive Impairment

Cognitive impairment following cardiac surgery is another critical factor that directly affects quality of life. These impairments may manifest in various forms, such as difficulties with concentration, memory problems, and challenges with social integration, and can lead to long-term consequences.[12,24] The prevalence of postoperative delirium and cognitive decline among patients over the age of 60 ranges from 30% to 52%, and these conditions are associated with increased morbidity, mortality, and length of hospital stay.[25] In a case-control

study by Harmand et al.,[9] it was emphasized that preoperative cognitive assessment is associated with postoperative quality of life outcomes. Patients without preoperative cognitive impairment were found to have higher postoperative quality of life scores.[9] Thus, patients' cognitive status plays an active role in the postoperative period. Moreover, in a randomized controlled study conducted by Butz et al.,[25,26] which utilized a paper-and-pencil-based cognitive training program, the effectiveness of cognitive education was reflected in improved postoperative outcomes. In the intervention group, quality of life significantly improved by the third postoperative month. In another study by the same author, similar cognitive training led to enhanced quality of life in the intervention group during long-term postoperative follow-up (at 12 months).

Surgical Techniques and Methods

Elective cardiac surgeries have been associated with satisfactory survival rates and improved quality of life, even among individuals over the age of 80. In contrast, emergency or unplanned surgical interventions are linked to higher morbidity and mortality rates.[27] However, this does not mean emergency surgeries should be entirely excluded. Challenges encountered during preoperative preparation for emergency cardiac surgeries may negatively impact postoperative outcomes. Several factors—including age, gender, obesity, and comorbid conditions—can influence this process.[27] Therefore, careful attention must be given to the preoperative preparation of these patients, and quality of life should be evaluated as an independent outcome. In the study by Deschka et al.,[27] no significant long-term differences in quality of life were found between patients undergoing elective and emergency procedures.

Surgical technique also plays a critical role in determining postoperative quality of life. Although avoiding cardiopulmonary bypass is intended to reduce the risk of embolic complications, randomized controlled trials have reported no significant differences in long-term mortality or quality of life between on-pump and off-pump procedures.[14] On the other hand, minimally invasive approaches such as transcatheter aortic valve implantation (TAVI) have been shown to improve quality of life in elderly patients, with notable improvements observed within the first 30 days and at one-year follow-up.[18]

Medication Use

Preoperative polypharmacy is common among older adults and has been associated with functional decline, increased complication risk, reduced survival, and decreased quality of life.[23] Comprehensive medication management and evaluation of potential drug interactions before surgery may help reduce these risks. In a study by Arends et al.,[23] the use of five or more medications was linked to chronic postoperative pain and functional decline. This highlights the need for systematic polypharmacy assessments in the preoperative phase.

In another study, Chitnis et al.[24] examined the impact of postoperative sedative agents on quality of life. They found that the use of dexmedetomidine in the intensive care unit, compared to propofol, did not result in a significant difference in postoperative quality of life.

Limitations

This review discusses quality of life after cardiac surgery in elderly patients and the factors that influence it. However, the heterogeneous nature of the reviewed literature introduces several limitations to interpretation. Significant differences exist between studies in terms of patient profiles, surgical methods, tools used to assess quality of life, and follow-up periods. These discrepancies may limit the generalizability of some findings. Additionally, the small number of randomized controlled trials reporting long-term results hinders the ability to evaluate changes in quality of life through a cause-and-effect lens. Another limitation is that most of the studies were conducted in single centers with relatively small sample sizes, making it difficult to generalize the results to the broader elderly population. Finally, the retrospective design of one study increases the risk of methodological bias.

For these reasons, prospective, multicenter studies using standardized criteria are needed to improve our understanding of the factors influencing quality of life in older adults following cardiac surgery.

Conclusion

This systematic review examined 16 studies addressing quality of life outcomes in elderly patients following cardiac surgery. Postoperative quality of life in these patients can show significant improvement depending on various influencing factors. A subsequent analysis of the quality of life assessment and postoperative follow-up periods of the articles revealed that the significant improvements that commenced at the third month post-surgery persisted at the sixth and twelfth months. The reviewed studies indicate that both open-heart surgery and minimally invasive procedures positively affect patients' quality of life in terms of physical, psychological, and functional well-being. Among elderly individuals, quality of life is significantly influenced by variables such as age group, gender, chronic pain, frailty, cognitive status, and the type of surgical technique used. Overall, with appropriate patient selection and individualized assessment, cardiac surgery in older adults has the potential to yield meaningful improvements in quality of life. However, to assess the sustainability and long-term impact of these outcomes, further prospective, randomized controlled, and multicenter studies are needed.

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References

1. Anderson M, Parke R, Jull A. Effect of Cardiac Surgery on Health-Related Quality of Life in Patients Aged 75 Years or Older: A Prospective Study. *Heart Lung Circ*. 2021;30(2):282-287. [CrossRef]
2. Blokzijl F, van der Horst IC, Keus E, Waterbolk TW, Mariani MA, Dieperink W. Quality of life in elder adults one-year after coronary bypass. *J Vasc Nurs*. 2016;34(4):152-157. [CrossRef]
3. World Health Organization (WHO). World report on ageing and health. World Health Organization, 2015. Accessed May 20, 2025. https://apps.who.int/iris/handle/10665/186463
4. Kalyoncuo S, Kartın PT. Active aging and individualized care approaches in elderly patients. *Geriatr Gerontol Int*. 2021;21(7):590-596. Turkish.
5. Karan MA, Satman I. Turkey Elderly Health Report: Current Status, Problems, and Short- to Medium-Term Solutions. Istanbul: Turkish Health Institutes Directorate, Public Health and Chronic Diseases Institute; 2021. Accessed April 20, 2025. https://hsgm.saglik.gov.tr/depo/birimler/kronik-hastaliklar-ve-yasli-sagligi-db/Dokumanlar/Raporlar/TUSEB_Turkiye_Yasli_Sagligi_Raporu_Guncel_Durum_Sorunlar_ve_Kisa-Orta_Vadeli_Cozumler_2021.pdf
6. Dığrak E, Savsar A, Öğce Aktaş F, Aygüler M. Evaluation of self-efficacy and satisfaction with post-discharge tele-health monitoring of patients undergoing coronary artery bypass graft surgery. *Turk J Cardiovasc Nurs*. 2024;15(38):156-162. [CrossRef]
7. Turkish Statistical Institute (TURKSTAT). Death and causes of death statistics, 2019. Ankara: TURKSTAT; 2020. Accessed July 25, 2025. https://data.tuik.gov.tr/Bulten/Index?dil=2&p=death-and-causes-of-death-statistics-2019-33710
8. Republic of Turkiye Ministry of Health, Directorate General of Public Health. Turkiye Cardiovascular Diseases Prevention and Control Program (2021-2026). Ankara: Ministry of Health; 2021. Accessed April 20, 2025. https://hsgm.saglik.gov.tr/depo/birimler/kronik-hastaliklar-ve-yasli-sagligi-db/Dokumanlar/Kitaplar/KalpDamarEylemPlani_2021-2026.pdf
9. Harmand MG, Mata M, Prada-Arrondo PC, Domínguez-Rodríguez A, Barroso J, Galtier I. Influence of mild cognitive impairment on clinical and functional prognosis in older candidates for cardiac surgery. *Front Hum Neurosci*. 2024;17:1158069. [CrossRef]
10. Romero PS, de Souza EN, Rodrigues J, Moraes MA. Changes in quality of life associated with surgical risk in elderly patients undergoing cardiac surgery. *Int J Nurs Pract*. 2015;21(5):592-597. [CrossRef]
11. Miguelena-Hycka J, Lopez-Menendez J, Prada PC, et al. Influence of Preoperative Frailty on Health-Related Quality of Life After Cardiac Surgery. *Ann Thorac Surg*. 2019;108(1):23-29. [CrossRef]
12. Bendikaite R, Vimantaite R. Cognitive Impairment Prevalence and Impact on Quality of Life for Patients after Cardiac Surgery. *Heart Surg Forum*. 2020;23(5):E590-E594. [CrossRef]
13. Andrási TB, Schellenberg C, Vasiloi A, Glück AC. Health-related quality of life after minimal-invasive treatment of aortic valve stenosis in the elderly. *J Thorac Dis*. 2024;16(4):2274-2284. [CrossRef]
14. Østergaard B, Holbæk E, Sørensen J, Steinbrüchel D. Health-related quality of life after off-pump compared with on-pump coronary bypass grafting among elderly high-risk patients: A randomized trial with eight years of follow-up. *EurJ Cardiovasc Nurs*. 2016;15(2):126-133. [CrossRef]
15. Baig K, Harling L, Papanikitas J, et al. Does coronary artery bypass grafting improve quality of life in elderly patients? *Interact Cardiovasc Thorac Surg*. 2013;17(3):542-553. [CrossRef]
16. Çayırteoe Z, Esatoğlu AE, Aral A. A systematic review of studies evaluating quality of life after coronary artery bypass graft surgery. *Turkiye Klin J Health Sci*. 2020;5(3):688-701. [CrossRef]
17. Yokose S, Miura T, Hashizume K, Hisata Y, Hisatomi K, Tanigawa K, Eishi K. Long-Term Quality of Life after Cardiac and Thoracic Aortic Surgery for Very Elderly Patients 85 Years or Older. *Ann Thorac Cardiovasc Surg*. 2016;22(5):298-303. [CrossRef]
18. Lauck SB, Yu M, Ding L, et al. Quality-of-Life Outcomes After Transcatheter Aortic Valve Implantation in a "Real World" Population: Insights From a Prospective Canadian Database. *CJC Open*. 2021;3(8):1033-1042. [CrossRef]
19. Coelho PNMP, Miranda LMRPC, Barros PMP, Fragata JIG. Quality of life after elective cardiac surgery in elderly patients. *Interact Cardiovasc Thorac Surg*. 2019;28(2):199-205. [CrossRef]
20. Marshall L, Griffin R, Mundy J. Frailty assessment to predict short term outcomes after cardiac surgery. *Asian Cardiovasc Thorac Ann*. 2016;24(6):546-554. [CrossRef]
21. Berastegui Garcia E, Camara Rosell ML, Moret Ruiz E, et al. The impact of frailty in aortic valve surgery. *BMC Geriatr*. 2020;20(1):426. [CrossRef]
22. Luckraz H, Nagarajan K, Chnaris A, et al. Preserved Quality of Life in Octogenarians at Early, Mid, and Late Follow-Up Intervals Irrespective of Cardiac Procedure. *Semin Thorac Cardiovasc Surg*. 2016;28(1):48-53. [CrossRef]
23. Arends BC, Timmerman L, Vernooij LM, et al. Preoperative frailty and chronic pain after cardiac surgery: a prospective observational study. *BMC Anesthesiol*. 2022;22(1):201. [CrossRef]
24. Chitnis S, Mullane D, Brohan J, et al. Dexmedetomidine Use in Intensive Care Unit Sedation and Postoperative Recovery in Elderly Patients Post-Cardiac Surgery (DIRECT). *J Cardiothorac Vasc Anesth*. 2022;36(3):880-892. [CrossRef]
25. Butz M, Gerriets T, Sammer G, et al. The impact of postoperative cognitive training on health-related quality of life and cognitive failures in daily living after heart valve surgery: A randomized clinical trial. *Brain Behav*. 2023;13(3):e2915. [CrossRef]
26. Butz M, Gerriets T, Sammer G, et al. Twelve-month follow-up effects of cognitive training after heart valve surgery on cognitive functions and health-related quality of life: a randomised clinical trial. *Open Heart*. 2023;10(2):e002411. [CrossRef]
27. Deschka H, Müller D, Dell'Aquila A, Matthäus M, Erler S, Wimmer-Greinecker G. Non-elective cardiac surgery in octogenarians: Do these patients benefit in terms of clinical outcomes and quality of life? *Geriatr Gerontol Int*. 2016;16(4):416-423. [CrossRef]

Appendix 1. Characteristics of included studies

Author	Research type	Sample size	Age x̄ (min-max)	Type of cardiac surgery	Scales used for quality of life assessment	Total follow-up duration	Result	Quality score
Østergaard et al.[14] 2016	Prospective randomized controlled trials	n=120 (elderly patients over 70 years old), off-pump:61, on-pump:59	Total mean age:75±4.5, off-pump:76+-4.8, on-pump: 75+-4.2	Coronary artery bypass grafting with or without pump	SF-36	3 months, 12 months, 8 years	Quality of life was observed to improve more significantly in patients who underwent coronary artery bypass grafting (CABG) compared to those who received off-pump surgery. In both groups, physical functioning and mental health improved during the postoperative period from the third to the twelfth month. However, a decline in quality of life was noted between 12 months and 8 years postoperatively.	10
Deschka et al.[27] 2016	Prospective cohort study	n=62 (elderly patients over 80 years old); Urgent: 33 Emergency:29	Urgent:83.1±2.9; Emergency: 83.9±3.1	Non-elective cardiac surgery	SF-12	1 year	The presence of comorbidities prior to surgery, length of intensive care unit stay, dependence on ECMO, the nature of the surgery (elective vs. emergent), and the development of postoperative complications have all been associated with postoperative mortality. However, no clear difference in long-term quality of life has been observed between patients undergoing elective and emergent surgery.	7
Yokose et al.[17] 2016	Prospective cohort study	n=46 (elderly patients over 85 years old)	Total mean age: 86.6±1.8 (85-91)	Cardiac and thoracic aortic surgery	the Barthel Index (BI) Fillenbaum instrumental activities of daily living scale (Fillenbaum IADL the Vitality Index (VI)	Preoperative, 6 months, 12 months, 18 months	Preoperative independence in patients aged 85 and older who underwent cardiac and thoracic aortic surgery was associated with satisfactory long-term quality of life outcomes. Therefore, very elderly patients who maintain preoperative independence may also be considered suitable candidates for surgery, provided their independence levels are carefully evaluated beforehand.	7
Marshall et al.[20] 2016	Prospective comparative	n=123 (elderly patients over 70 years old)	Total mean age: 77.1 (70-92); Robust: 76.0, Borderline: 77.0, Frail:80.61	Elective cardiac surgery	SF-36	3 months	Quality of life in the emotional domains was found to be comparable across all three groups prior to surgery. However, borderline and frail patients experienced a decline in quality of life at the third postoperative month compared to the robust group.	9
Luckraz et al.[22] 2016	Prospective comparative	n=308 (elderly patients over 80 years old): Group A=76, Group B=109, Group C=123	Group A=81.9±1.8, Group B=82.1±1.9, Group C= 81.5±1.4	CABG, Valve surgery, Complex/ multiple cardiac surgery	SF-12	5 years	Quality of life was found to improve in the long term following surgery, regardless of the type of procedure. The study indicated that patients aged 80 and above benefited from cardiac surgery and maintained a good quality of life over time.	8
Coelho et al.[19] 2019	Prospective cohort study	n=430 (elderly patients over 65 years old)	74±5.5	Elective cardiac surgery	SF-36	Preoperative, 3 months, 6 months, 12 months	Significant improvement in the physical component was observed during the first postoperative year. In contrast, mental health showed significant improvement only between the preoperative assessment and the third postoperative month, with no notable change between 6 and 12 months. Most physical health improvements occurred within the first three months and continued to progress significantly up to 12 months. Additionally, factors such as poor preoperative physical and mental health, female gender, advanced age, and longer hospital or ICU stays were found to negatively affect quality of life.	10
Berastegui Garcia et al.[21] 2020	Prospective cohort study	n=200 (elderly patients over 70 years old)	78.25±4.6	Elective aortic valve replacement	EQ-5D	30 days, 6 months, 1 year	Patients in the frail group who underwent valve replacement surgeries using different techniques were found to have higher long-term mortality rates, which also negatively affected their quality of life. In this context, preoperative frailty assessment was suggested to be beneficial for monitoring long-term quality of life.	9

Appendix 1 (cont). Characteristics of included studies

Author	Research type	Sample size	Age $\bar{x}$ (min–max)	Type of cardiac surgery	Scales used for quality of life assessment	Total follow-up duration	Result	Quality score
Anderson et al.[1] 2021	Prospective descriptive study	n=66 (elderly patients over 75 years old)	79.2±2.9 (75–88)	Elective cardiac surgery	SF-12	Preoperative-3 months	Average quality of life scores showed significant improvement across all subdomains. Similar outcomes were observed in both the 75–79 and 80+ age groups. Notably, age 80 and above alone was not found to be a contraindication for surgery, as quality of life improvements in this group were comparable to those in younger age groups.	9
Arends et al.[23]	Prospective cohort study	n=518 (elderly patients over 70 years old); No chronic pain=336, Chronic pain=182.	No chronic pain: 74 (72–77), Chronic pain: 75 (72–78)	Elective cardiac surgery	SF-36	3-12 months	While patients without chronic pain showed a significant improvement in quality of life, those with chronic pain experienced a deterioration. It was found that patients with excessive polypharmacy, those living alone, and those with lower preoperative mental health-related quality of life had an increased risk of developing chronic pain, which, in turn, contributed to a poorer quality of life.	10
Chitnis et al.[24] 2022	Prospective randomized controlled trials	n=67 (elderly patients over 75 years old); Propofol=33, Dex.=34.	Propofol=78.8, Dex.=78.7.	CABG and AVR	SF-36	Preoperative, 6 months	Quality of life was found to improve at 6 months compared to baseline in most patients in both groups. However, no statistically significant difference was observed between the groups.	10
Butz et al.[25] 2023	Prospective randomized controlled trials	n=94; Training (n=47), Control (n=47).	Training = 71.2±4.7, Control = 73.0±4.9	Elective aortic or mitral valve replacement / reconstruction with CABG, with or without ECC.	SF-36	3 months	Three months after the intervention, improvements in health-related quality of life were observed in the education group compared to the control group. It was also concluded that postoperative cognitive impairment negatively impacts health-related quality of life.	10
Butz et al.,[26] 2023	Prospective randomized controlled trials	n=94; Training (n=47), Control (n=47).	Training = 71.2±4.7, Control = 73.0±4.9.	Elective aortic or mitral valve replacement/ reconstruction with CABG, with or without ECC.	SF-36	12 months	Butz et al.[25,26] conducted a study in 2023, presenting results from both the 3-month and 12-month groups, which were derived from the same sample and analyzed separately. The results at 3 months post-intervention were reported in the previous study, while this study focuses on the 12-month outcomes. Twelve months after the intervention, the education group demonstrated a better quality of life compared to the control group. In patients undergoing cardiac surgery, postoperative cognitive training was found to have a significant positive impact on quality of life, particularly at the 12-month follow-up.	10
Harmand et al.,[9]2024	Prospective case-control study	Control=26, Patients=48.	Control = 73.42± 3.68 (65-80), Patient = 75.31± 5.15 (65-85).	All cardiac surgery	EQ-5D (EuroQol)	12 months	A significant improvement in quality of life was observed when comparing preoperative and postoperative assessments.	10
Andrási et al.[13] 2024	Prospective cohort study	n=197; TF-TAVI = 137, PUMS-SAVR (Control) = 60.	TF-TAVI = 78.6±6.5, PUMS-SAVR = 66.3±7.0.	TF-TAVI and PUMS-SAVR	SF36_LQ	6 months	Patients who underwent TAVI demonstrated a higher quality of life postoperatively.	6

Appendix 1 (cont). Characteristics of included studies

Author	Research type	Sample size	Age $\bar{x}$ (min–max)	Type of cardiac surgery	Scales used for quality of life assessment	Total follow-up duration	Result	Quality score
Miguelena-Hycka et.[11] 2019	Prospective cohort study	n=137 (elderly patients aged 70 and over).	78.4±4.2 (72-83).	Elective cardiac surgery	EQ-5D (EuroQol)	6 months	A significant improvement in quality of life was observed in frail and frailty-prone patients 6 months after heart surgery.	10
Lauck et al.[18] 2021	Retrospective cohort study	n=1706	Median age =83 (77-86).	TAVI	KCCQ-OS	Preoperative, 30 days and 1 year	The changes in patients' quality of life showed significant improvement from baseline to 30 days and 1 year, which was associated with TAVI. Although not statistically significant, women exhibited more sustained improvement between the 30-day and 1-year time points.	8

Dex: Dexmedetomidine; SF-36: Short Form-36 Health Survey; SF-12: Short Form-12 Health Survey; TF-TAVI: Transfemoral Transcatheter Aortic Valve Implantation; TAVI: Transcatheter Aortic Valve Implantation; PUMS-SAVR: Percutaneous Ultrasonography-guided Mitral Valve Surgery with Surgical Aortic Valve Replacement; CABG:Coronary Artery Bypass Grafting; BI: Barthel Index; IADL: Instrumental activities of daily living scale; VI: Vitality Index; EQ-5D: EuroQol; KCCQ-OS: Kansas City Cardiomyopathy Questionnaire - Overall Summary; ECC: extracorporeal circulation; AVR: Aortic Valve Replacement.

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Üniversite Öğrencilerinde Sigara Kullanımının Kan Basıncı ve Kalp Hızına Akut Etkisi

Acute Effects of Cigarette Smoking on Blood Pressure and Heart Rate in University Students

KLİNİK ÇALIŞMA
ORIGINAL ARTICLE

ÖZET

Amaç: Bu çalışmada üniversite öğrencilerinde sigara kullanımının kan basıncı ve kalp hızına akut etkisini belirlemek amaçlandı.

Yöntem: Araştırma, 20 Nisan 2023-15 Ağustos 2023 tarihleri arasında İstanbul'da bir devlet üniversitesinde öğrenim gören öğrencilerle yapıldı. Verilerin toplanmasında; Öğrenci Bilgi Formu, Fagerström Nikotin Bağımlılık Testi, kan basıncı ve kalp hızı ölçümleri kullanıldı. Analizlerde tanımlayıcı istatistikler ve bağımlı gruplarda t testi kullanıldı.

Bulgular: Öğrencilerin %50,8'i kadın, %98,1'i bekar ve yaş ortalaması 22,81 ± 1,56 yıl bulundu. Öğrencilerin %62,9'u 1-5 yıl arası sigara içmekteydi. Sigara içenlerin %62,5'inin günde 11-20 adet sigara içtiği saptandı. Öğrencilerin nikotin bağımlılık ortalamasının 4,87 ± 1,83 olduğu belirlendi. %22'sinin düşük, %58,3'ünün orta ve %19,7'sinin yüksek nikotin bağımlısı olduğu tespit edildi. Öğrencilerin post test sistolik kan basıncı [t(263) = -15,211; P < 0,001, d = 0,29], post test diyastolik kan basıncı [t(263) = -12,054; P < 0,001, d = 0,31) ve post test kalp hızı [t(263) = -18,245; P < 0,001, d = 0,46) pre test değerlerinden yüksek saptandı.

Sonuç: Bu çalışmada, üniversite öğrencilerinin nikotin bağımlılık düzeyi orta düzeyde tespit edildi. Sigara içildikten sonraki kalp hızının, sistolik ve diyastolik kan basıncının sigara kullanımı öncesinden yüksek olduğu saptandı. Sürekli sigara içmek, kan basıncının ve kalp hızının yüksek olmasına neden olarak kardiyovasküler hastalıklar için bir risk faktörü oluşturabilmektedir.

Anahtar Kelimeler: Kalp hızı, kan basıncı, nikotin bağımlılığı, öğrenci, sigara

ABSTRACT

Objective: This study aimed to determine the acute effects of cigarette smoking on blood pressure and heart rate in university students.

Method: The study was conducted between April 20, 2023, and August 15, 2023, with students enrolled at a state university in Istanbul. Data were collected using the Student Information Form, the Fagerström Nicotine Dependence Test, and blood pressure and heart rate measurements. Descriptive statistics and paired-samples t-tests were used in the analysis.

Results: Of the participants, 50.8% were female, 98.1% were single, and the mean age was 22.81 ± 1.56 years. Among the students, 62.9% had been smoking for 1–5 years, and 62.5% reported smoking 11–20 cigarettes per day. The mean nicotine dependence score was 4.87 ± 1.83. It was found that 22% had low, 58.3% had moderate, and 19.7% had high levels of nicotine dependence. Post-test systolic blood pressure (t(263) = -15.211; P < 0.001; d = 0.29), post-test diastolic blood pressure (t(263) = -12.054; P < 0.001; d = 0.31), and post-test heart rate (t(263) = -18.245; P < 0.001; d = 0.46) were significantly higher than the pre-test values.

Conclusion: In this study, university students were found to have a moderate level of nicotine dependence. Heart rate, systolic, and diastolic blood pressure were significantly higher after smoking compared to before smoking. Regular smoking may lead to elevated blood pressure and heart rate, increasing the risk of cardiovascular disease.

Keywords: Heart rate, blood pressure, nicotine dependence, student, smoking

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Giriş

Dünya Sağlık Örgütü, tütün kullanımını salgın olarak kabul etmektedir. Tütün salgını, dünyanın karşı karşıya kaldığı en büyük halk sağlığı tehditlerinden biridir. Sigara içmek en yaygın tütün kullanım biçimidir. Dünya çapında yılda 8 milyondan fazla insanı

öldürmektedir.[1] Sigara içmek Türkiye'de de ciddi bir halk sağlığı sorunudur.[2] Tütün içmek birçok ölüm ve hastalığın önlenebilir bir nedenidir. Bu ölümlerin 7 milyondan fazlası doğrudan tütün kullanımının sonucuyken, yaklaşık 1,3 milyonu sigara içmeyenlerin sigara dumanına maruz kalmasının sonucudur. Tütün kullanımının her biçimi zararlıdır ve tütüne maruz kalmanın güvenli bir seviyesi yoktur.[1] Türkiye İstatistik Kurumu (TÜİK) verilerine göre her gün tütün mamulü kullanan 15 yaş ve üstü bireylerin oranının 2019 yılında %28 iken, 2022 yılında artarak %28,3 olduğu bulunmuştur. Bu oranın 2022 yılında erkeklerde %41,3, kadınlarda ise %15,5 olduğu tespit edilmiştir.[3]

Sigara içmek kardiyovasküler hastalık için önemli bir risk faktörüdür, ancak sigara içmenin kardiyovasküler hastalık üzerindeki zararlı etkilerini hangi mekanizmayla uyguladığı net değildir.[4] Günde sadece bir sigara içmek bile koroner arter hastalığı ve inme riskini artırmaktadır. Hem aktif hem de pasif tütün kullanımı endotel disfonksiyonuna yol açarak aterosklerozun oluşmasına neden olur, böylece kardiyovasküler hastalıkların görülme sıklığını artırır.[5] Nikotin, katran ve karbonmonoksit de dahil olmak üzere 7000'den fazla kimyasal, kalp hızı ve miyokart kontraktilitesini artırır, inflamasyon, endotel bozulması, trombüs oluşumu ve yüksek dansiteli lipoprotein (HDL) kolesterolün serum düzeylerinde azalma yoluyla da kardiyovasküler hastalık gelişme riskine neden olmaktadır.[6,7]

Türkiye'de üniversite öğrencilerinde sigara içme oranı %20-45 arasındadır.[2,8-10] Akut sigara içimi, özellikle sigara içildikten sonraki ilk 5 ila 10 dakika içinde kalp hızı parametrelerini değiştirebilmektedir.[11] Dünya Sağlık Örgütü verilerine göre sigara bırakıldığında 20 dakika içinde kalp atış hızı ve kan basıncı düşmektedir.[1] Sigara içmenin kan basıncı üzerindeki etkileri net değildir. Sadece bir sigara içmek, sempatik sinir sistemi aktivasyonu yoluyla kan basıncını akut ve geçici olarak artırabilmektedir.[6,12] İlk sigaradan sonra sistolik kan basıncı ortalama yaklaşık 20 mmHg yükselmektedir. Sigara içtikten sonra nikotinin yarı ömrü yaklaşık iki saattir. Bu nedenle sürekli sigara içildiğinde kan basıncı yüksek kalır.[6] Ayrıca, normal ila yüksek normal kan basıncına sahip mevcut sigara içicilerinin (120-139/75-89 mmHg) normal ila yüksek normal kan basıncına sahip sigara içmeyenlere kıyasla kardiyovasküler hastalık için daha yüksek risk altında olduğu bilinmektedir.[6] Üniversite öğrencilerinde sigara içiciliğinin çok yaygın olması, ileride kardiyovasküler hastalıkları daha da artırabilir. Sigara içmenin kan basıncı ve kalp hızı üzerindeki akut ve kronik etkileri üzerinde daha çok araştırmaya gerek vardır. Türkiye'de üniversite öğrencilerinde sigara kullanımının kan basıncı ve kalp hızına akut etkisine bakıldığı çalışmaya rastlanılmadı. Bu nedenle, bu çalışmada üniversite öğrencilerinde sigara kullanımının kan basıncı ve kalp hızına akut etkisinin belirlenmesi amaçlandı.

ANA NOKTALAR

- Üniversite öğrencilerinde sigara kullanımı yaygındır. Sigaranın kan basıncı ve kalp hızı üzerindeki kısa ve uzun vadeli etkileri net değildir.
- Bu çalışmada üniversite öğrencilerinde nikotin bağımlılık düzeyi orta düzeydedir.
- Sigara kullanım sonrası kalp hızı, sistolik ve diyastolik kan basıncının sigara kullanım öncesinden yüksek olduğu saptandı.
- Üniversite öğrencilerinde yaygın sigara kullanımı sadece kardiyovasküler hastalıkları için değil diğer birçok hastalık için de risk teşkil etmektedir. Sigaranın bırakılmasına yönelik daha fazla projeye ihtiyaç vardır.

Gereç ve Yöntem

Araştırmanın Amacı

Üniversite öğrencilerinde sigara kullanımının kan basıncı ve kalp hızına akut etkisini belirlemek amacıyla tek grup pre test ve post test desenli tanımlayıcı bir çalışma olarak planlandı.

Araştırma Soruları

Öğrencilerin nikotin bağımlılık düzeyleri nedir?

Öğrencilerin sigara kullanımı öncesi ve sonrası kalp hızı, sistolik ve diyastolik kan basıncı arasında fark var mıdır?

Araştırmanın Yeri ve Zamanı

Araştırma 20 Nisan 2023-15 Ağustos 2023 tarihleri arasında İstanbul'da bir devlet üniversitesinin sağlık bilimleri fakültesinde öğrenim gören öğrencilerinde yapıldı.

Araştırmanın Örneklemi

Araştırmanın örneklem büyüklüğü G*Power 3.1.9.7 programı kullanılarak hesaplandı.[13] Hesaplamada t test: ortalama: iki bağımlı ortalama arasında (eşleşen çiftler) modelde örneklem hesaplaması yapıldı. Yapılan hesaplamada, iki yönlü, 0,20 etki büyüklüğü,[14,15] %5 hata payı (α = 0,05), %80 güç (1-β = 0,80) alınarak örneklem sayısı 199 olarak hesaplandı. Ancak çalışmada en büyük örneklem sayısına ulaşılması hedeflenildi. Çalışma sonucunda yapılan post hoc güç analizinde; iki yönlü, etki büyüklüğü: 0,29 (pre test ve post test sistolik kan basıncı arasındaki Cohen d = 0,29), total örneklem sayısı 264 alındığında güç 0,999 olarak belirlendi. Örneklem sayısı yeterli bulundu.

Araştırmaya Dahil Edilme Kriterleri

- En az altı aydır sigara kullanması
- Araştırmaya katılmayı kabul etmiş olması

Araştırmadan Dışlanma Kriterleri

- Çalışma süresince çalışmadan kendi isteğiyle çıkmak isteyen öğrenciler
- Bilinen kardiyovasküler bir hastalığının olması

Veri Toplama Yöntemi ve Araçları

Verilerin toplanmasında; Öğrenci Bilgi Formu, Fagerström Nikotin Bağımlılık Testi, kan basıncı ve kalp hızı ölçümleri kullanıldı. Veriler yüz yüze, üniversitenin kampüs bahçesinde ya da sınıfta toplandı. Sınav stresi kalp hızı ve kan basıncını değiştirebileceği için sınav haftasında veri toplanmadı. Öğrencilere öncelikle anket soruları cevaplandırıldı. İlk kan basıncı ve kalp hızı ölçümü sigara içmeden önce yapıldı (pre test). İkinci kan basıncı ve kalp hızı ölçümü sigara içildikten hemen sonra bakıldı (post test). Tüm öğrenciler için toplam iki kan basıncı ve kalp hızı ölçümü alındı.

İlk kan basıncı ölçümü, öğrenci beş dakikalık dinlenmeden sonra rahat bir şekilde otururken ölçüldü. İlk ölçümde öğrencinin en az 30 dakika önce egzersiz ve kafein, tütün gibi uyarıcı almamasına ve mesanenin boş olmasına dikkat edildi. Öğrenciler bacakları ve sırtları desteklenmiş şekilde sandalyede oturtuldu.[16] Kol desteklenerek (izometrik egzersiz kaynaklı kan basıncı artışlarını

Tablo 1. Öğrencilerin sosyodemografik özellikleri (n = 264)

Değişkenler	n	%
Cinsiyet	Kadın	134
	Erkek	130
Medeni Durum	Evli	5
	Bekar	259
Sigara içme süresi	<1 yıl	51
	1-5 yıl	166
	6 yıl ve üstü	47
Günde kaç adet sigara içmekte	1-10 adet	47
	11-20 adet	165
	21 ve üstü	52
Kronik hastalık durumu	Evet	48
	Hayır	216
Alkol kullanma durumu	Evet	44
	Hayır	220
Ailede hipertansiyon durumu	Evet	174
	Hayır	90
Yaş, $\bar{x}$ ± SS (min-maks)	22,81 ± 1,56 (20-35)	

SS, Standart sapma; Min, Minimum; Maks, Maksimum.

önlemek için) ve manşet yerleştirme yerinde giysi olmayacak şekilde Omron M3-M6-M7 (22-42 cm) dijital otomatik kan basıncı ölçüm cihazı kullanılarak brakiyal arterden kan basıncı ve kalp hızı ölçüldü.[16]

İkinci ölçüm; öğrenciler bir sigara içtikten sonra yapıldı. Yine ilk ölçümdeki gibi öğrenci en az beş dakika dinlenmeden sonra, bacakları ve sırtları desteklenmiş şekilde sandalyede oturtuldu. Kol desteklenerek ve manşet yerleştirme yerinde giysi olmayacak şekilde Omron M3-M6-M7 (22-42 cm) dijital otomatik kan basıncı ölçüm cihazı kullanılarak brakiyal arterden kan basıncı ve kalp hızı ölçüldü.

Öğrenci Bilgi Formu

Öğrenci Bilgi Formu literatür taranarak hazırlanmış olup, demografik ve sigara kullanımlarıyla (yaş, medeni durum, cinsiyet, sigara içme sıklığı gibi) ilgili soruların bulunduğu sekiz sorudan oluşmaktaydı.[8,9,17]

Fagerström Nikotin Bağımlılık Testi

Fagerström Nikotin Bağımlılık Testi, Fagerström ve Schneider tarafından sigara bağımlılık seviyesini ölçmek amacıyla sekiz soruluk "Fagerström Tolerans Testi" olarak tasarlanmıştır.[18] Daha sonra 1991 yılında Heatherton ve arkadaşları[19] tarafından uyarlanarak altı sorudan oluşan "Fagerström Nikotin Bağımlılık Testi" geliştirilmiştir. Fagerström Nikotin Bağımlılık Testinin Türkçe geçerlilik ve güvenilirlik çalışması Uysal ve arkadaşları[20] tarafından 2004 yılında yapılmıştır. Altı maddelik ölçeğin her bir maddesi 0-3 ve 0-1 puan arasında puanlanmaktadır. Ölçekten alınabilecek puan aralığı 0-10 arasında değişmektedir. Nikotin bağımlılığı düşük (0-3 puan), orta (4-6 puan), yüksek (≥ 7 puan) şeklinde üç gruba ayrılmaktadır. Cronbach alfa değeri 0,56 olarak bulunmuştur. Bu çalışmada ölçeğin Cronbach alfa değeri 0,60 bulundu.

Tablo 2. Fagerström Nikotin Bağımlılık Testi puanlaması (n = 264)

	(X̄ ± SS)	Ortanca (min-maks)
Nikotin bağımlılığı puanı	4,87 ± 1,83	5 (1-10)
	n	%
Nikotin bağımlılığı düzeyi		
Düşük (0-3 puan)	58	22
Orta (4-6 puan)	154	58,3
Yüksek (7-10 puan)	52	19,7

SS, Standart sapma; Min, Minimum; Maks, Maksimum.

Araştırmanın Etik İzni

Katılımcıların sözel ve yazılı onamları alındı. Çalışmanın etik izni; Marmara Üniversitesi Sağlık Bilimleri Fakültesi Girişimsel Olmayan Klinik Araştırmalar Etik Kurulu'ndan (Onay Numarası: 196, Tarih: 29.12.2022). Çalışmanın kurum izni Marmara Üniversitesi rektörlüğünden (Sayı: E-16110545-604.01.01-526114; Tarih: 19.04.2023) alındı. Araştırma, Helsinki Bildirgesi'nin hükümlerine uygundur.

Verilerin İstatistiksel Analizi

Araştırmada elde edilen veriler bilgisayar ortamında IBM SPSS v.21 (IBM Corp., Armonk, New York, USA) istatistik programı aracılığıyla değerlendirildi. Araştırmaya katılan katılımcıların tanımlayıcı özelliklerinin belirlenmesinde frekans ve yüzde analizlerinden, ölçeğin incelenmesinde ortalama ve standart sapma istatistikleri kullanıldı. Araştırma değişkenlerinin normal dağılım gösterip göstermediğini belirlemek üzere Skewness (Çarpıklık) ve Kurtosis (Basıklık) değerlerine bakıldı. Değişkenlerin basıklık çarpıklık değerlerine ilişkin sonuçlarının +1,5 ile -1,5 veya +2,0 ile -2,0 arasında olması normal dağılım olarak kabul edilmektedir.[21] Değişkenlerin normal dağılım gösterdiği bulundu. Verilerin analizinde parametrik yöntemler yapıldı. Pre test ve post test ölçümleri arasındaki farklılıkları göstermek için bağımlı gruplarda t testi analizi yapıldı. Etki büyüklüğünü hesaplamak için Cohen (d) kullanıldı. Etki büyüklüğü, gruplar arasındaki farkın önemli kabul edilecek büyük bir fark olup olmadığını belirtmektedir. Cohen değeri; 0,2 = küçük, 0,5 = orta ve 0,8 = büyük olarak değerlendirilmektedir.[14]

Bulgular

Öğrencilerin %50,8'i kadın, %98,1'i bekar ve yaş ortalaması 22,81 ± 1,56 yıl bulundu. Öğrencilerin %62,9'u 1-5 yıl arası sigara içmekteydi. %62,5'inin günde 11-20 adet sigara içtiği saptandı. %18,2'si kronik hastalığa sahipti. %16,7'si alkol kullanmaktaydı. %65,9'unun ailesinde hipertansiyon hastası vardı (Tablo 1).

Öğrencilerin nikotin bağımlılık ortalamasının 4,87 ± 1,83 olduğu belirlendi. %22'sinin düşük, %58,3'ünün orta ve %19,7'sinin yüksek nikotin bağımlısı olduğu tespit edildi (Tablo 2).

Öğrencilerin pre test (ortalama = 123,41 ± 10,95) ve post test (ortalama = 126,47 ± 10,10) sistolik kan basıncı arasında fark saptandı [t(263) = -15,211; P < 0,001, d = 0,29]. Pre test (ortalama = 83,39 ± 7,21) ve post test (ortalama = 85,54 ± 6,60) diyastolik kan basıncı arasında istatistiksel olarak anlamlı fark bulundu [t(263) = -12,054; P < 0,001, d = 0,31]. Pre test (ortalama = 85,77 ± 10,85) ve post test (ortalama = 90,89 ± 11,23) kalp hızı arasında anlamlı fark belirlendi [t(263) = -18,245; P < 0,001, d = 0,46) (Tablo 3).

Tablo 3. Öğrencilerin sigara kullanım öncesi ve sonrası kalp hızı, sistolik ve diyastolik kan basıncı değerleri (n = 264)

Değişkenler	Pre test $\bar{X} \pm SS$	Post test $\bar{X} \pm SS$	Ortalama fark	t	df	P	Etki büyüklüğü
Sistolik kan basıncı (mmHg)	123,41 ± 10,95	126,47 ± 10,10	-3,06	-15,211	263	**<0,001**	0,29
Diyastolik kan basıncı (mmHg)	83,39 ± 7,21	85,54 ± 6,60	-2,15	-12,054	263	**<0,001**	0,31
Kalp hızı (atım/dk)	85,77 ± 10,85	90,89 ± 11,23	-5,12	-18,245	263	**<0,001**	0,46

SS, Standart sapma; t, Bağımlı gruplarda t testi; df, Serbestlik derecesi.

Tartışma

Bu çalışmada, öğrencilerin nikotin bağımlılık ortalamasının 4,87 ± 1,83 olduğu belirlendi. %22'sinin düşük, %58,3'ünün orta ve %19,7'sinin yüksek nikotin bağımlısı olduğu tespit edildi (Tablo 2). Doğanay ve arkadaşlarının[22] üniversite öğrencilerinde yaptıkları çalışmada %40,3'ünün düşük düzeyde nikotin bağımlısı, %47,2'sinin orta düzeyde nikotin bağımlısı, %12,5'inin ise yüksek düzeyde nikotin bağımlısı olduğu saptanmıştır.[22] Türkiye'de tıp öğrencilerinde yapılan çalışmada nikotin bağımlılık ortalaması 3,1 ± 2,6 olarak saptanmıştır.[2] Afrikalı-Amerikan öğrencilerinde yapılan çalışmada, Fagerström Nikotin Bağımlılığı Testi puan ortalamasının 6,73 ± 1,53 olduğu görülmüştür.[23] Ürdün'de üniversite öğrencilerinin nikotin bağımlılığı oranı %51,2 olarak belirlenmiştir.[24] Bu çalışmanın sonuçları yukarıdaki çalışmalarla benzerdir. Üniversite öğrencilerinde nikotin bağımlılığının yüksek olduğu görülmektedir. Bunun nedenleri arasında stres, akademik baskı, sosyal çevrenin etkisi ve alışkanlıkların erken yaşta edinilmesi gibi çeşitli faktörler bulunmaktadır. Özellikle üniversite yılları, bireylerin kimlik oluşturma süreçlerinin hızlandığı, bağımsızlık duygusunun arttığı bir dönemdir. Bu süreçte sigara kullanımı, bazı öğrenciler için bir rahatlama mekanizması veya sosyal bir aktivite olarak görülebilir. Öğrencilerde nikotin bağımlılığının yüksek olmasının ileride birçok hastalığı da beraberinde getirmesi öngörülmektedir. Ayrıca bu durum sadece bireysel bir sağlık sorunu değil, aynı zamanda toplumun genel sağlık seviyesini etkileyen önemli bir meseledir. Bu çalışmada üniversite öğrencilerinin sigara içildikten sonraki kalp hızı, sistolik ve diyastolik kan basıncının sigara kullanımı öncesinden yüksek olduğu saptandı (Tablo 3). Başka çalışmalarda da sigaranın hem kan basıncında hem de kalp hızında akut artışa neden olduğu bulunmuştur.[25,26] Karakaya ve arkadaşlarının[11] çalışmasında akut sigara içiminin, sigara içildikten sonraki ilk 5 ila 10 dakika içinde kalp hızı parametrelerini değiştirdiği bulunmuştur.[11] Sağlıklı pasif içiciliğe sahip kadınlarda yapılan çalışmalarda, sigaraya maruziyet sonrası kalp hızı ve kan basıncında yüksek bir akut etkiye sahip olduğu gösterilmiştir.[27,28] Üniversite öğrencilerinde yapılan bir çalışmada sigara içen erkeklerin ve kadınların, sigara içmeyenlere göre daha yüksek sistolik ve diyastolik kan basıncına sahip oldukları belirlenmiştir. Sigara içmenin kadınlarda kalp hızı üzerinde istatistiksel olarak anlamlı bir fark oluşturmadığı bulunmuştur. Ancak kalp hızı değerleri sigara içen erkeklerde sigara içmeyenlere göre daha yüksek görülmüştür.[29] Randomize kontrolü bir meta-analiz çalışmasında sigara içmenin dinlenme kalp hızı seviyesine göre daha yüksek olduğu saptanmıştır. Kan basıncındaki değişikliklerle ve hipertansiyon riskiyle ilişkili olmadığı vurgulanmıştır.[4] Li ve arkadaşlarının[30] çalışmasında, erkeklerde sigara içenlerde düzeltilmiş kan basıncının sigara içmeyenlere ve sigarayı bırakanlara göre daha düşük olduğu belirlenmiştir. Sigara hipertansiyon için risk faktörü olarak görülmemiştir. Endonezya'da yapılan bir çalışmada sigara kullanımı ile kan basıncı arasında bir ilişki bulunmamıştır.[31] Vietnamlı erkeklerde yapılan çalışmada sigara içenlerle, hiç sigara içmeyenler arasında hipertansiyon açısından fark saptanmamıştır.[32] Sri Lankalı erkeklerde yapılan çalışmada da tütün içmenin kan basıncını ve serum lipid seviyelerini etkilediği ve böylece sigara içenler arasında kardiyovasküler riski artırdığı bulunmuştur.[17] Çin'de yapılan çalışmada sigara içmenin hipertansiyon ve yüksek kan basıncı için bir risk faktörü olmadığı görülmüştür.[33] Yukarıdaki çalışmalara bakıldığında sigara içmenin akut kan basıncında yükselmeye neden olduğu görüldü. Bu yönüyle bu çalışma desteklenmektedir. Bunun nedeni, nikotinin vazokonstrüksiyon, sempatik sinir sistemi aktivasyonu, karbonmonoksit maruziyeti ve endotel disfonksiyonu gibi etkileri olabilir. Bazı çalışmalarda sigara içenlerde sigara içmeyenlerle kan basıncı değerleri karşılaştırıldığında yüksek, düşük veya fark olmadığı görülmektedir. Sigaranın kronik etkileri net değildir. Bu farkın oluşması cinsiyet, beden kitle indeksi gibi ilişkili durumlardan kaynaklanabilir.

Sonuç

Bu çalışmada üniversite öğrencilerinin nikotin bağımlılık düzeyi orta olarak belirlendi. Sigara içildikten sonraki kalp hızı, sistolik ve diyastolik kan basıncının sigara kullanım öncesinden yüksek olduğu saptandı. Çalışmada sigara kullanımının kan basıncı ve kalp hızına akut bir etkisi olduğu görüldü. Sürekli sigara içmek, kan basıncının ve kalp hızının yüksek olmasına neden olarak kardiyovasküler hastalıklar için bir risk faktörü oluşturabilmektedir. Üniversite öğrencileri, nikotin bağımlılık oranları yüksek olduğu için gelecekte sadece kardiyovasküler hastalıkları için değil, diğer birçok hastalık için de risk altındalar. Türkiye'de sigara kullanım oranları yüksektir, sigaranın bırakılmasına yönelik daha fazla projeye ihtiyaç vardır.

Etik Kurul Onayı: Etik komite onayı Marmara Üniversitesi Sağlık Bilimleri Fakültesi Girişimsel Olmayan Klinik Araştırmalar Etik Kurulu'ndan (Onay Numarası: 196, Tarih: 29.12.2022) alınmıştır.

Bilgilendirilmiş Onam: Katılımcıların sözel ve yazılı onamları alındı.

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Kaynaklar

1. World Health Organization (WHO). Tobacco. Accessed November 31, 2024. https://www.who.int/news-room/fact-sheets/detail/tobacco
2. Fakili F, Taylan M, Dogru S, Al-Haithamy S. Prevalence of smoking among medical students and associated factors in Turkey. *J Subst Use*. 2024;29(3):382-388. [CrossRef]
3. Türkiye İstatistik Kurumu (TÜİK). Türkiye Sağlık Araştırması, 2022. Accessed June 1, 2023. https://data.tuik.gov.tr/Bulten/Index?p=Turkiye-Saglik-Arastirmasi-2022-49747#:~:text=28%2C3%20oldu-,Her%20g%C3%BCn%20t%C3%BCt%C3%BCn%20mamul%C3%BC%20kullanan%2015%20ya%C5%9F%20ve%20%C3%BCst%C3%BC%20bireylerin,15%2C5%20oldu%C4%9Fu%20tespit%20edildi
4. Linneberg A, Jacobsen RK, Skaaby T, et al. Effect of Smoking on Blood Pressure and Resting Heart Rate: A Mendelian Randomization Meta-Analysis in the CARTA Consortium. *Circ Cardiovasc Genet*. 2015;8(6):832-841. [CrossRef]
5. DiGiacomo SI, Jazayeri MA, Barua RS, Ambrose JA. Environmental Tobacco Smoke and Cardiovascular Disease. *Int J Environ Res Public Health*. 2018;16(1):96. [CrossRef]
6. Kondo T, Nakano Y, Adachi S, Murohara T. Effects of Tobacco Smoking on Cardiovascular Disease. *Circ J*. 2019;83(10):1980-1985. [CrossRef]
7. Leone A. Toxics of Tobacco Smoke and Cardiovascular System: From Functional to Cellular Damage. *Curr Pharm Des*. 2015;21(30):4370-4379. [CrossRef]
8. Oğuz S, Çamcı G, Kazan M. The Prevalence of Cigarette Smoking and Knowing Status for Diseases Caused by Smoking among Students of University. *Van Med J*. 2018;25(3):332-337. [CrossRef]
9. Tüzün E, Ağlar İ, Çakmak İ, et al. Thoughts, Attitudes and Behaviors of Medical Faculty Students Regarding E-Cigarette Use. *İzmir Göğüs Hastanesi Derg*. 2024;38(1):1-28. Turkish.
10. Yüksel S, Cücen Z. Enquiries into Cigarette Smoking Habits of University Students. *Turk Thorac J*. 2019;13(4):169-173. [CrossRef]
11. Karakaya O, Barutcu I, Kaya D, et al. Acute effect of cigarette smoking on heart rate variability. *Angiology*. 2007;58(5):620-624. [CrossRef]
12. Ebina T. Smoking and Incident Hypertension - Importance of Cotinine-Verified Smoking Status. *Circ J*. 2018;82(6):1510-1512. [CrossRef]
13. Faul F, Erdfelder E, Lang AG, Buchner A. G*Power 3: a flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behav Res Methods*. 2007;39(2):175-191. [CrossRef]
14. Cohen J. *Statistical power analysis for the behavioral sciences*. 2nd edition. Routledge; 1988.
15. Polit DF, Beck CT. *Nursing research: Generating and assessing evidence for nursing practice*. 8th edition. Lippincott Williams & Wilkins; 2008.
16. McEvoy JW, McCarthy CP, Bruno RM, et al.; ESC Scientific Document Group. 2024 ESC Guidelines for the management of elevated blood pressure and hypertension. *Eur Heart J*. 2024;45(38):3912-4018. Erratum in: *Eur Heart J*. 2025;46(14):1300. [CrossRef]
17. Herath P, Wimalasekera S, Amarasekara T, Fernando M, Turale S. Effect of cigarette smoking on smoking biomarkers, blood pressure and blood lipid levels among Sri Lankan male smokers. *Postgrad Med J*. 2022;98(1165):848-854. [CrossRef]
18. Fagerstrom KO, Schneider NG. Measuring nicotine dependence: a review of the Fagerstrom Tolerance Questionnaire. *J Behav Med*. 1989;12(2):159-182. [CrossRef]
19. Heatherton TF, Kozlowski LT, Frecker RC, Fagerström KO. The Fagerström Test for Nicotine Dependence: a revision of the Fagerström Tolerance Questionnaire. *Br J Addict*. 1991;86(9):1119-1127. [CrossRef]
20. Uysal MA, Kadakal F, Karşidağ C, Bayram NG, Uysal O, Yilmaz V. Fagerstrom test for nicotine dependence: reliability in a Turkish sample and factor analysis. *Tuberk Toraks*. 2004;52(2):115-121.
21. George D, Mallery P. *IBM SPSS statistics 26 step by step: A simple guide and reference*. 16th edition. Routledge; 2019. [CrossRef]
22. Doğanay S, Özdemir AE, Trabzon Ş. Nicotine dependence level of university students relating to type of education and gender. *IJHSRP*. 2017;2(2):74-79. [CrossRef]
23. Moolchan ET, Hudson DL, Schroeder JR, Sehnert SS. Heart rate and blood pressure responses to tobacco smoking among African-American adolescents. *J Natl Med Assoc*. 2004;96(6):767-771.
24. Khatatbeh MM, Alkhaldi S, Khader Y, et al. Prevalence of nicotine dependence among university students in Jordan: a cross-sectional study. *EBPH*. 2019;16(2): e13075-e13077. [CrossRef]
25. De Cesaris R, Ranieri G, Filitti V, Bonfantino MV, Andriani A. Cardiovascular effects of cigarette smoking. *Cardiology*. 1992;81(4-5):233-237. [CrossRef]
26. Arastoo S, Haptonstall KP, Choroomi Y, et al. Acute and chronic sympathomimetic effects of e-cigarette and tobacco cigarette smoking: role of nicotine and non-nicotine constituents. *Am J Physiol Heart Circ Physiol*. 2020;319(2):H262-H270. [CrossRef]
27. Yarlioglues M, Kaya MG, Ardic I, et al. Acute effects of passive smoking on blood pressure and heart rate in healthy females. *Blood Press Monit*. 2010;15(5):251-256. [CrossRef]
28. Felber Dietrich D, Schwartz J, Schindler C, et al.; SAPALDIA-team. Effects of passive smoking on heart rate variability, heart rate and blood pressure: an observational study. *Int J Epidemiol*. 2007;36(4):834-840. [CrossRef]
29. Al-Safi SA. Does smoking affect blood pressure and heart rate? *Eur J Cardiovasc Nurs*. 2005;4(4):286-289. [CrossRef]
30. Li G, Wang H, Wang K, et al. The association between smoking and blood pressure in men: a cross-sectional study. *BMC Public Health*. 2017;17(1):797. [CrossRef]
31. Sohn K. Relationship of Smoking to Hypertension in a Developing Country. *Glob Heart*. 2018;13(4):285-292. [CrossRef]
32. Thuy AB, Blizzard L, Schmidt MD, Luc PH, Granger RH, Dwyer T. The association between smoking and hypertension in a population-based sample of Vietnamese men. *J Hypertens*. 2010;28(2):245-250. [CrossRef]
33. Li H, Tong W, Wang A, Lin Z, Zhang Y. Effects of cigarette smoking on blood pressure stratified by BMI in Mongolian population, China. *Blood Press*. 2010;19(2):92-97. [CrossRef]

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Hipertansif Bireylerin Kan Basıncı Farkındalığı ve İçgörü Düzeylerinin Öz Etkililik Düzeyleriyle İlişkisi: Kesitsel Çalışma

The Relationship Between Blood Pressure Awareness, Insight, and Self-Efficacy in Individuals with Hypertension: A Cross-Sectional Study

ÖZET

Amaç: Bu araştırmada hipertansif bireylerin kan basıncı farkındalığı ve içgörü düzeyleriyle öz etkililik düzeyleri arasındaki ilişkinin belirlenmesi amaçlandı.

Yöntem: Tanımlayıcı, ilişki arayıcı ve kesitsel tipte olan bu çalışma, bir aile sağlığı merkezine kayıtlı olan, çalışmaya dahil edilme kriterlerini sağlayan, hipertansiyon tanısı olan 250 birey ile Haziran-Aralık 2024 tarihleri arasında gerçekleştirildi. Araştırma verileri Tanıtıcı Bilgi Formu, Kan Basıncı Farkındalığı ve İçgörü Ölçeği ve Hipertansiyon Öz Etkililik Ölçeği kullanılarak toplandı.

Bulgular: Bireylerin yaş ortalaması 52,07 ± 8,89 yıl, hipertansiyon tanı süresi ise bireylerin %34,8'inde 1-5 yıl olarak belirlendi. Bireylerin %54,8'inin kadın, %48,8'inin ilköğretim mezunu olduğu görüldü. Bireylerin %49,6'sının fazla kilolu (28,34 ± 4,99) olduğu belirlendi. Bireylerin %43,6'sının kan basıncı çok yüksek (140/90 mmHg üzeri), %24,4'ü sigara içmekte, %12'si alkol kullanmakta ve %45,2'sinde ek hastalık bulunmakta idi. Bireylerin Kan Basıncı Farkındalığı ve İçgörü Ölçeği ortalama toplam puanı 7,68 ± 1,47 olarak saptandı. Hipertansiyon Öz Etkililik toplam puan ortalaması ise 64,67 ± 10,32 olarak bulundu. Hipertansiyon Öz Etkililik toplam puanı ile Kan Basıncı Farkındalığı ve İçgörü Ölçeği ortalama toplam puanı arasında pozitif yönde, güçlü ve istatistiksel olarak anlamlı bir ilişki olduğu saptandı (r = 0,639; P = 0,000).

Sonuç: Hipertansif bireylerin öz etkililik düzeylerinin orta düzeyin üzerinde olduğu, kan basıncı farkındalığı ve içgörü düzeylerinin ise yüksek düzeyde olduğu saptandı. Kan basıncı farkındalığı ve içgörü düzeyi arttıkça hipertansiyon öz etkililik düzeyinin de anlamlı düzeyde arttığı belirlendi.

Anahtar Kelimeler: Farkındalık, hipertansiyon, içgörü, kan basıncı, öz etkililik

ABSTRACT

Objective: This study aimed to examine the relationship between blood pressure awareness, insight, and self-efficacy in individuals with hypertension.

Method: This descriptive, correlational, and cross-sectional study was conducted between June and December 2024. A total of 250 individuals diagnosed with hypertension, registered at a family health center, and meeting the inclusion criteria were included. Data were collected using a demographic information form, the Blood Pressure Awareness and Insight Scale (BASIS), and the Hypertension Self-Efficacy Scale.

Results: The mean age of participants was 52.07 ± 8.89 years, with 34.8% having been diagnosed with hypertension for 1 to 5 years. Among participants, 54.8% were female, and 48.8% were primary school graduates. Additionally, 49.6% were overweight (BMI: 28.34 ± 4.99). Blood pressure readings exceeded 140/90 mmHg in 43.6% of participants. Furthermore, 24.4% reported smoking, 12.0% consumed alcohol, and 45.2% had comorbidities. The mean total BASIS score was 7.68 ± 1.47, while the mean total score for hypertension self-efficacy was 64.67 ± 10.32. A strong, positive, and statistically significant correlation was found between self-efficacy scores and BASIS scores (r = 0.639; P < 0.001).

Conclusion: Individuals with hypertension demonstrated high levels of blood pressure awareness and insight, and their self-efficacy levels were above moderate. Increased awareness and insight into blood pressure were significantly associated with higher levels of hypertension self-efficacy.

Keywords: Awareness, hypertension, insight, blood pressure, self-efficacy

KLİNİK ÇALIŞMA
ORIGINAL ARTICLE

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Giriş

Hipertansiyon; önlenebilir ölüm nedenleri arasında ilk sıralarda yer alan, yüksek düzeyde morbidite ve mortaliteye neden olan önemli bir sağlık sorunudur. Kontrol altına alınmadığında kalp hastalığı, kalp krizi, kalp yetersizliği, serebrovasküler hastalık, böbrek hastalığı, görme kaybı gibi ciddi komplikasyonlara neden olabilmektedir.[1] Dünya genelinde 1,39 milyar insanı etkileyen hipertansiyon ve beraberinde meydana gelebilen komplikasyonlar yeti yitimine bağlı yaşam yılı kayıplarının ve erken ölümlerin en önemli sebeplerindendir.[2] Türkiye İstatistik Kurumu tarafından 2023 yılında açıklanan verilere göre %33,4 oranla en önemli ölüm nedeni olan dolaşım sistemi hastalıklarından kaynaklı ölümlerin %9,6'sını hipertansif hastalıklar oluşturmaktadır.[3]

İlerleyen yaşla beraber hipertansiyon prevalansı artış göstermektedir. Hipertansiyonun görülme sıklığında günden güne meydana gelen artışla beraber önleme ve hastalık yönetimi çalışmalarının planlanması küresel açıdan daha önemli bir hale gelmektedir.[4] Hipertansiyonun yönetimi ve komplikasyonların önlenmesinde risk faktörlerini belirlemek ve önleyici girişimlerde bulunmak çok önemlidir.[5] Hipertansiyonun risk faktörleri ileri yaş, obezite, sağlıksız diyet, sedanter yaşam, diyabet gibi ek hastalıkların varlığı, yüksek kolesterol düzeyi, sigara ve alkol kullanımı olarak sayılmakta olup büyük oranda önlenebilir durumlardan oluşmaktadır. Bu durumların önlenmesi veya ortadan kaldırılması sonucunda hastalık yönetiminin sağlanması için bireylerde yaşam tarzı değişikliği ve tedaviye uyum gerekmektedir.[4,6]

Hipertansiyon tedavisinde hastalığın yönetimi bireyin reçete edilen ilaçları düzenli kullanması ve sağlıklı yaşam tarzını benimsemesiyle sağlanabilmektedir.[2] Dünya Kalp Federasyonu (WHF) kardiyovasküler sağlığın korunması adına hipertansiyonun önlenmesi, tespiti ve yönetimi için bir yol haritası oluşturmuştur. Kan basıncını düzenleyen önlemler arasında sağlıklı beslenme, kilo yönetimi, düzenli fiziksel aktivite, alkolden ve sigaradan uzak durmak bulunmaktadır.[7,8] Yapılan bir çalışmada hipertansif bireylerde bilgi düzeyinin iyi olmasına rağmen hipertansiyon kontrolünün yeterli olmaması, bireylerin bildiklerini uygulamıyor olmasıyla açıklanmıştır.[6] Başka bir çalışmada da hipertansiyonla ilgili yeterli bilgiye sahip olsalar bile bireylerin %40,5'inin durumlarından, %75,8'inin normal kan basıncı değerlerinden habersiz oldukları bulunarak benzer sonuçlara ulaşılmıştır. Bu nedenle bireylerde hastalık yönetiminin sağlanabilmesi için sağlıklı yaşam tarzı değişimlerine ihtiyaç vardır ve tedaviye uyum açısından farkındalık oluşturulması gerekmektedir.[9]

Bireylerde farkındalığın oluşturulması tedavi sürecinde daha aktif olmalarını sağlamaktadır. Hastalık farkındalığının bozulması sonucunda tedaviye ve gerekli yaşam şekli değişimlerine uyum azalabilmekte, bu nedenle hastalığın klinik seyri olumsuz etkilenebilmektedir.[10] Yapılan bir çalışmada bireylerin hipertansiyon farkındalıklarının, hipertansiyondan korunma önlemleri hakkında tutum ve davranışlarının yetersiz olduğu belirlenmiştir.[4] Yapılan başka çalışmalarda bireylerin kan basıncı farkındalığı ve içgörüsü arttıkça hastalığa yönelik subjektif farkındalıklarının arttığı ve bu durumun tedavi sürecine uyumu olumlu etkilediği bulunmuştur.[10,11]

ANA NOKTALAR

- Hipertansif bireylerde öz etkililik düzeyini geliştirmek hastalığın yönetiminde oldukça önemlidir.
- Yeterli öz etkililik düzeyi, komplikasyon sayısını azaltmak ve hipertansiyonu kontrol etmek için önemlidir.
- Araştırma sonucuna göre hipertansif bireylerin yüksek düzeyde olan içgörü ve öz etkililik düzeylerinin hastalık ve tedaviye uyumlarını olumlu yönde etkileyebileceği görülmektedir.
- Kan basıncı farkındalığı ve içgörü düzeyinin artması hipertansiyon öz etkililik düzeyinin artmasında etkilidir.

Bireylerde hipertansiyona yönelik farkındalığı artırmak için öz etkililik düzeyini geliştirmek de hastalığın yönetiminde oldukça önemlidir. Özellikle kronik hastalıklarda bireyin daha aktif olduğu ve daha fazla sorumluluk aldığı bakıma ihtiyaç vardır.[2,8] Bu boyutta birey merkezli bakım (Patient Centered Care; PCC) bireyin öz yönetimini artırmaktadır. Yapılan bir çalışmada bireylerin kronik hastalığı yönetmede öz etkililiği arttıkça yaşam kalitesinin de arttığı bulunmuştur.[12] Bununla birlikte literatürde bu konu ile ilgili yapılan araştırma sonuçlarının yeterli düzeyde ve güncel veriler olmaması nedeniyle bu araştırmada hipertansif bireylerin kan basıncı farkındalığı ve içgörü düzeyleriyle öz etkililik düzeyleri arasındaki ilişkinin belirlenmesi amaçlanmaktadır. Araştırmada, hipertansiyon tanısı olan bireylerin kan basıncı farkındalığı ve içgörü düzeyleri, öz etkililik düzeyleri nasıldır? ve Hipertansiyon tanısı olan bireylerde kan basıncı farkındalığı ve içgörü düzeyleri ile öz etkililik düzeyleri arasında ilişki var mıdır? sorularına cevap arandı.

Yöntem

Araştırma tanımlayıcı nitelikte, ilişki arayıcı ve kesitsel bir çalışmadır.

Evren ve Örneklem

Araştırmanın evrenini, Haziran-Aralık 2024 tarihleri arasında bir aile sağlığı merkezine kayıtlı olan, çalışmaya dahil edilme kriterlerini sağlayan, hipertansiyon tanısı olan 700 birey oluşturdu. Araştırmanın evreni dahilinde örneklem hesabı evreni bilinen örnekleme yöntemiyle %5 kabul edilebilir hata ve %95 güven aralığında, p = q = 0,5 ile 249 olarak hesaplandı (Erişim Adresi: https://www.medhesap.com/orneklem-boyutu-hesaplama/ Erişim Tarihi: 10.03.2025) Araştırmanın dahil edilme kriterlerine uyan 250 birey ile veri toplama süreci tamamlandı. Araştırmaya 18 yaş üzerinde olan, araştırmaya katılmayı isteyen, en az altı ay önce hipertansiyon tanısı konulan bireyler dahil edildi. Araştırmaya ciddi zihinsel engeli olan, ölçek sorularını algılamasını veya iletişim kurmasını engelleyecek sağlık sorununa sahip olan bireyler dahil edilmedi.

Verilerin Toplanması

Veriler Haziran-Aralık 2024 tarihleri arasında dahil edilme kriterlerine uygun bireylerle yüz yüze görüşme yöntemi ile toplandı. Ölçek sorularının tamamlanması yaklaşık 10 dakika sürdü. Veriler Tanıtıcı Bilgi Formu, Kan Basıncı Farkındalığı ve İçgörü Ölçeği, Hipertansiyon Öz Etkililik Ölçeği kullanılarak toplandı.[8,10,11,13]

Tablo 1. KFİÖ ve hipertansiyon öz etkililik puan ortalamaları (n = 250)

	N	X̄	SS	Minimum	Maksimum	Kurtosis	Skewness
KFİÖ ortalama toplam	250	7,677	1,470	3,560	9,920	1,211	-1,481
Semptomların katkılarının farkındalığı	206	8,214	2,444	1,000	10,000	-1,415	-0,144
Genel hastalık farkındalığı	250	7,285	2,367	3,000	10,000	0,845	-0,290
Tedavi gereksinimi farkındalığı	250	6,685	1,005	3,330	9,670	0,962	-1,546
Olumsuz sonuçların farkındalığı	250	8,812	1,670	2,000	10,000	-0,775	-0,519
Hipertansiyon öz etkililik toplam	250	64,672	10,319	33,000	80,000	-0,088	-0,690

KFİÖ, Kan Basıncı Farkındalığı ve İçgörü Ölçeği; SS, Standart sapma.

Tanıtıcı Bilgi Formu: Form, araştırmacılar tarafından oluşturulan, bireylerin demografik özellikleri, fiziksel özellikleri ve yaşam biçimi alışkanlıkları ile ilgili 16 sorudan oluşmaktadır.

Kan Basıncı Farkındalığı ve İçgörü Ölçeği: Bireylerin kan basıncı farkındalığı ve içgörüsünü değerlendiren ölçek Gerretsen ve arkadaşları[10] tarafından geliştirilmiş, Türkçe geçerlilik ve güvenilirlik çalışması Yılmaz ve arkadaşları[11] tarafından yapılmıştır. Kan Basıncı Farkındalığı ve İçgörü Ölçeği; genel hastalık farkındalığı, semptomların katkılarının farkındalığı, tedavi gereksinimi farkındalığı ve olumsuz sonuçların farkındalığı dört alt boyutundan oluşmaktadır. Ölçekten alınan toplam puan ortalaması arttıkça farkındalık ve içgörü artmaktadır. Ölçeğin orijinal Cronbach alfa değeri 0,75 olarak hesaplanmıştır.[11] Bu araştırmada kullanılan Kan Basıncı Farkındalığı ve İçgörü Ölçeğinin iç tutarlılık katsayısı Cronbach alfa değeri 0,845 olarak bulundu.

Hipertansiyon Öz Etkililik Ölçeği: Hipertansiyonlu bireylerin öz etkililik düzeylerini belirlemek amacıyla Han ve arkadaşları[13] tarafından geliştirilmiş, ölçeğin Türkçe geçerlilik ve güvenilirliği Türkoğlu ve Kılıç tarafından[8] yapılmıştır. Ölçek 20 maddeden oluşmaktadır. Ölçek toplam puanı 20-80 puan arasında değişmektedir. Ölçekten alınan toplam puan yükselmesi hipertansiyonda öz etkililik düzeyinin yükseldiğini göstermektedir. Ölçeğin Türkçe geçerlilik ve güvenilirliğinin yapıldığı çalışmada Cronbach alfa değeri 0,88 olarak hesaplanmıştır.[8] Bu araştırmada kullanılan Hipertansiyon Öz Etkililik Ölçeğinin iç tutarlılık katsayısı Cronbach alfa değeri 0,914 olarak bulundu.

Araştırmanın Etik Yönü

Araştırma için Bartın Üniversitesi Sosyal ve Beşeri Bilimler Etik Kurulu'ndan (Protokol Numarası: 2023-SBB-0768, Karar Sayısı: 1, Toplantı Tarihi: 11.12.2023) etik izin ve araştırmada kullanılan ölçeklerin kullanılması için sorumlu yazarlarından e-posta yoluyla gerekli izinler alındı. Katılımcılara araştırmanın amacı, verilerin bilimsel amaçlı kullanılacağı, araştırmaya katılmanın gönüllülük esasına dayandığı Helsinki Bildirgesi'nde yer alan ilkelere bağlı kalınarak hazırlanan "Bilgilendirilmiş Gönüllü Olur Formu" kullanılarak yüz yüze görüşme yöntemiyle belirtildi, sözlü ve yazılı olarak onamları alındı. Araştırma makalemizin üretiminde yapay zeka destekli teknolojiler [Büyük Dil Modelleri (LLM), sohbet robotları veya görüntü oluşturucular gibi] kullanılmamıştır.

İstatistiksel Analiz

Araştırmada elde edilen veriler bilgisayar ortamında IBM SPSS Statistics for Windows, Version 22.0 (SPSS INC., Chicago, IL, USA) istatistik programı aracılığıyla değerlendirildi. Araştırmaya katılan bireylerin tanımlayıcı özelliklerinin belirlenmesinde frekans ve yüzde analizlerinden, ölçeğin incelenmesinde ortalama ve standart sapma istatistiklerinden faydalanıldı. Araştırma değişkenlerinin normal dağılım gösterip göstermediğini belirlemek üzere Kurtosis (Basıklık) ve Skewness (Çarpıklık) değerleri incelendi (Tablo 1). Değişkenlerin normal dağılım gösterdiği belirlendi. Verilerin analizinde parametrik yöntemler kullanıldı. Bireylerin ölçek düzeylerini belirleyen boyutlar arasındaki ilişkiler Pearson korelasyon ve Lineer regresyon analizleri aracılığıyla incelendi. Bireylerin tanımlayıcı özelliklerine göre ölçek düzeylerindeki farklılaşmaların incelenmesinde bağımsız gruplar t-testi, tek yönlü varyans analizi (ANOVA) ve post hoc (Tukey, LSD) analizlerinden faydalanıldı.

Bulgular

Bireylerin yaş ortalaması 52,07 ± 8,89 yıl, beden kitle indeksi değeri ortalaması 28,34 ± 4,99 olarak belirlendi. Bireylerin %54,8'inin kadın, %48,8'inin ilköğretim mezunu, %84,4'ünün gelirinin giderine denk, %49,6'sının beden kitle indeksi değerinin fazla kilolu olduğu görüldü. Bireylerin %34,8'inin 1-5 yıldır hipertansiyon tanısına sahip olduğu ve %43,6'sının kan basıncının çok yüksek (140/90 mmHg üzeri) olduğu bulundu (Tablo 2).

Bu araştırmada hipertansif bireylerin kan basıncı farkındalığı ve içgörü düzeylerinin yüksek düzeyde, öz etkililik düzeylerinin ise orta düzeyin üzerinde olduğu saptandı. Bireylerin Kan Basıncı Farkındalığı ve İçgörü Ölçeği ortalama toplam puanı 7,68 ± 1,47, hipertansiyon öz etkililik toplam puan ortalaması ise 64,67 ± 10,32 olarak bulundu (Tablo 1).

Hipertansiyon öz etkililik toplam puanı ile Kan Basıncı Farkındalığı ve İçgörü Ölçeği ortalama toplam puanı arasında pozitif yönde, güçlü ve istatistiksel olarak anlamlı bir ilişki olduğu saptandı (r = 0,639; P = 0,000). Alt boyutlar açısından değerlendirildiğinde ise; hipertansiyon öz etkililik puanı ile semptomların katkılarının farkındalığı (r = 0,604; P = 0,000), genel hastalık farkındalığı (r = 0,519; P = 0,000) ve olumsuz sonuçların farkındalığı (r = 0,668; P = 0,000) puanları arasında pozitif yönde, güçlü ve anlamlı ilişkiler bulundu (Tablo 3).

Kan basıncı farkındalığı ve içgörünün hipertansiyon öz etkililik üzerindeki etkisini belirlemek amacıyla yapılan regresyon analizi sonuçları incelendiğinde; oluşturulan regresyon modelinin anlamlı olduğu (F = 171,206; P = 0,000) ve modelin hipertansiyon öz etkililik toplam puanındaki varyansın %40,6'sını açıkladığı (R^2 = 0,406) görüldü. Analiz sonucuna göre Kan Basıncı Farkındalığı ve İçgörü Ölçeği ortalama toplam puanının hipertansiyon öz etkililik

Tablo 2. Bireylerin tanımlayıcı özelliklere göre dağılımı (n = 250)

Gruplar	n	%	Gruplar	n	%
Yaş			Sigara kullanımı		
40 ve altı	29	11,6	Evet	61	24,4
41-50	70	28,0	Hayır	156	62,4
51-60	98	39,2	Bırakmış	33	13,2
61 ve üzeri	53	21,2	Alkol kullanımı		
Cinsiyet			Evet	30	12,0
Kadın	137	54,8	Hayır	220	88,0
Erkek	113	45,2	Alkol sıklığı		
Eğitim durumu			Ayda bir veya daha az	21	70,0
İlköğretim	122	48,8	Haftada bir veya daha az	9	30,0
Ortaöğretim	59	23,6	Ek hastalık varlığı		
Ön lisans	24	9,6	Var	113	45,2
Lisans/lisans üstü	45	18,0	Yok	137	54,8
Gelir düzeyi			Ek hastalıklar (n = 113)*		
Gelir gidere denk	211	84,4	Kalp yetersizliği	13	11,5
Gelir giderden fazla	39	15,6	Koroner kalp hastalığı	20	17,7
BKİ			Diyabet	72	63,7
Normal	51	20,4	KOAH-astım	40	35,4
Fazla kilolu	124	49,6	Tiroid fonksiyon bozukluğu	7	6,2
Obez ve üzeri	75	30,0	Kanser hastalığı	1	0,9
Hipertansiyon süresi			Ritim bozukluğu	2	1,8
6 ay-1 yıl	32	12,8	Kalp kapak hastalığı	1	0,9
1-5 yıl	87	34,8	Hiperlipidemi	8	7,1
6-10 yıl	64	25,6	Artrit	2	1,8
10 yıldan fazla	67	26,8	Vertigo	2	1,8
Kan basıncı				$\bar{X}$	SS
Normal	63	25,2	Yaş	52,070	8,891
Yüksek	78	31,2	BKİ	28,340	4,990
Çok yüksek	109	43,6	Sigara içme süresi bırakan	19,580	8,522
			Sigara içme süresi içen	21,540	9,064
			Sigara günlük miktar	17,750	7,447

Normal, Sistolik kan basıncı 90-120 mmHg/diyastolik kan basıncı 60-80 mmHg arasında; Yüksek, Sistolik kan basıncı 130-139 mmHg/diyastolik kan basıncı 80-89 mmHg arasında; Çok Yüksek, 140/90 mmHg Değerinden Fazla. *, Ek hastalık varlığı sorusunda 113 kişi ek hastalığı olduğunu belirtmiş olup bazı katılımcıların birden fazla ek hastalığı bulunmaktadır. KOAH, Kronik obstrüktif akciğer hastalığı; BKİ, Beden kitle indeksi; SS, Standart sapma.

puanı üzerinde pozitif yönde ve anlamlı bir etkisi olduğu saptandı (β = 0,639; t = 13,085; P = 0,000). Bu sonuca göre, kan basıncı farkındalığı ve içgörü düzeyi arttıkça hipertansiyon öz etkililik düzeyinin de anlamlı düzeyde arttığı belirlendi. Modelin hata terimlerinin bağımsızlığını test eden Durbin Watson değeri ise 1,624 olarak bulunmuş olup, bu değer modelin uygun olduğunu göstermektedir (Tablo 4).

Yaş grupları arasında Kan Basıncı Farkındalığı ve İçgörü Ölçeği ortalama toplam (F = 6,507; P = 0,000), semptomların katkılarının farkındalığı (F = 2,918; P = 0,035), genel hastalık farkındalığı (F = 5,330; P = 0,001) ve olumsuz sonuçların farkındalığı (F = 4,547; P = 0,004) ile hipertansiyon öz etkililik puanları (F = 3,864; P = 0,010) arasında anlamlı farklılıklar bulundu. Post-hoc analiz sonuçlarına göre; 40 yaş ve altı olan grubun puanları diğer gruplardan daha yüksektir. Kadınların Kan Basıncı Farkındalığı ve İçgörü Ölçeği ortalama toplam (t = 3,494; P = 0,001), semptomların katkılarının farkındalığı (t = 2,969; P = 0,004), olumsuz sonuçların farkındalığı (t = 4,397; P = 0,000) ve hipertansiyon öz etkililik toplam puanlarının (t = 5,653; P = 0,000) erkeklere göre daha yüksek olduğu bulundu. Beden kitle indeksi ile kan basıncına göre Kan Basıncı Farkındalığı ve İçgörü Ölçeği puanları ve hipertansiyon öz etkililik puanları arasında anlamlı farklılıklar bulundu (P < 0,05). Sigara içmeyen ve bırakan grupların semptomların katkılarının farkındalığı (F = 4,427; P = 0,013) ve hipertansiyon öz etkililik (F = 17,801; P = 0,000) puanları sigara içenlere göre anlamlı düzeyde yüksek bulundu (Tablo 5).

Tablo 3. Hipertansiyon öz etkililik ve KFİÖ ortalama puanları arasında korelasyon analizi (n = 250)

	Hipertansiyon öz etkililik toplam
Semptomların katkılarının farkındalığı	
r	0,604*
P	0,000
Genel hastalık farkındalığı	
r	0,519*
P	0,000
Tedavi gereksinimi farkındalığı	
r	0,062
P	0,328
Olumsuz sonuçların farkındalığı	
r	0,668*
P	0,000
KFİÖ ortalama toplam	
r	0,639*
P	0,000

*, <0,01; Pearson Korelasyon Analizi. KFİÖ, Kan Basıncı Farkındalığı ve İçgörü Ölçeği.

Tartışma

Hipertansiyon kontrol altına alınmadığında ciddi komplikasyonlara neden olabilen önemli bir sağlık sorunudur.[4,6] Hipertansiyonun yönetimi ve komplikasyonların önlenmesinde bireylerin sağlıklı yaşam tarzı değişikliği ve tedaviye uyumu gerekmektedir.[1] Hastalık farkındalığının bozulması bireylerde sağlıklı yaşam tarzı değişikliği ve tedaviye uyumu azaltarak hastalığın klinik seyrini olumsuz etkilemektedir. Hipertansif bireylerde öz etkililik düzeyinin artması bireylerin farkındalığının geliştirilmesi ve hastalığın yönetimi için oldukça önemlidir.[10]

Literatürde yeterli öz etkililik düzeyinin, komplikasyon sayısını azaltmak için hipertansiyonu kontrol etmede önemli bir faktör olduğu belirtilmektedir. Hipertansiyonda öz etkililik ile öz bakım davranışına katılım arasındaki ilişkiyi belirlemeyi amaçlayan bir sistematik derlemede, öz etkililik ile öz bakım arasında anlamlı bir ilişki olduğu ve bireylerin öz etkililiklerini artırmanın sürekli öz bakım davranışlarını desteklemek için çok önemli olduğu bildirilmektedir.[14] Hipertansif bireylerin öz etkililik düzeylerinin öz bakım davranışı performansı üzerindeki etkisini belirlemek amacıyla yapılan başka bir çalışmada bireylerin öz etkililik düzeyi arttıkça sağlığı geliştirmeye yönelik davranışlarının da arttığı saptanmıştır.[15] Başol ve Özer[16] tarafından yapılan çalışmada hipertansif bireylerin öz etkililik düzeylerinin orta düzeyde olduğu bildirilmiştir. Benzer şekilde hipertansiyonu olan yetişkin bireylerin öz bakım profilinin belirlenmesi amacıyla yapılan çalışmada bireylerin öz bakım davranış düzeyinin orta düzeyde olduğu belirtilmiştir.[17] Hipertansif bireylerin öz etkililik düzeylerinin değerlendirildiği başka çalışmalarda da bireylerin öz etkililiklerinin yüksek düzeyde olduğu bulunmuştur.[7,18-20] Bu araştırmada ise hipertansif bireylerin öz etkililik düzeylerinin orta düzeyin üzerinde olduğu belirlendi (Tablo 1).

Kronik hastalıklarda sağlıklı yaşam biçimi davranışlarının benimsenmesi ve hastalık kontrolünün sağlanmasında farkındalık ve içgörü düzeyi etkili olmaktadır. Farkındalığın ve içgörü düzeyinin artması bireylerin tedaviye uyumunu olumlu yönde etkilemektedir.[21] Hipertansif bireylerde kan basıncı farkındalığı ve içgörüsünün artması bireylerin öz etkililik düzeylerini ve tedaviye uyumu artırmaktadır. Böylece etkili hastalık yönetimi ile klinik sonuçları iyileştirmektedir.[22] Yapılan bir çalışmada bireylerin kan basıncı farkındalığı ve içgörü düzeylerinin orta düzeyde olduğu bulunmuştur.[11] Başka bir çalışmada ise bireylerin kan basıncı farkındalığı ve içgörüsü düşük düzeyde bulunmuştur.[22] Hipertansiyonu olan kadınlarla yapılan bir çalışmada katılımcıların %42,9'unun kan basıncı düzeylerinin farkında olmadığı tespit edilmiştir.[23] Bu çalışmada hipertansif bireylerin kan basıncı farkındalığı ve içgörü düzeylerinin yüksek düzeyde olduğu bulundu (Tablo 1).

Yapılan bir çalışmada kan basıncını ölçme durumu ile ilaca uyum öz etkililik düzeyi arasında anlamlı bir ilişki olduğu saptanmıştır. Her gün tansiyonunu ölçen bireylerin ilaca uyum öz etkililik düzeylerinin daha yüksek olduğu saptanmıştır.[24] Başka bir çalışmada da benzer olarak her gün tansiyon ölçtüren hipertansif bireylerin ilaca uyum öz etkililik puan ortalamaları daha yüksek bulunmuştur.[25] Bu çalışmada da benzer şekilde hipertansiyon öz etkililik düzeyleri ile kan basıncı farkındalığı ve içgörü düzeyi arasında anlamlı bir ilişki olduğu saptanmış olup kan basıncı farkındalığı ve içgörü düzeyi arttıkça hipertansiyon öz etkililik düzeyinin de anlamlı düzeyde arttığı belirlendi (P = 0,000) (Tablo 3). Ayrıca bireylerin kan basıncı farkındalığı ve içgörü düzeyi arttıkça hipertansiyon öz etkililik düzeyinin de anlamlı düzeyde arttığı belirlendi (Tablo 4). Bu sonuçlara göre hipertansif bireylerin yüksek düzeyde olan içgörü ve öz etkililik düzeylerinin hastalık ve tedaviye uyumlarını olumlu yönde etkileyebileceği söylenebilir.

Hipertansif bireylerle yapılan çalışmalarda yaş arttıkça bireylerin öz etkililik düzeylerinin azaldığı bildirilmiştir.[19,26] Yapılan başka bir çalışmada ise yaşlı bireylerin daha iyi öz bakım davranışı sergileme eğiliminde olduğu bildirilmiştir.[27] Başol ve Özer[16] tarafından yapılan bir çalışmada da benzer şekilde yaş arttıkça bireylerin öz etkililik düzeylerinin arttığı tespit edilmiştir. Bu çalışmada 40 yaş ve altı olan grubun kan basıncı farkındalığı (P = 0,000) ve öz etkililik puanları diğer gruplardan daha yüksek bulundu (P = 0,010) (Tablo 5).

Tablo 4. Kan basıncı farkındalığı ve içgörünün hipertansiyon öz etkililik üzerine etkisi (n = 250)

Bağımsız değişken	Standart edilmemiş katsayılar		Standart edilmiş katsayılar	t	P	%95 güven aralığı	
	B	SE	β			Alt	Üst
Sabit	30,241	2,679		11,288	**0,000**	24,964	35,518
KFİÖ ortalama toplam	4,485	0,343	0,639	13,085	**0,000**	3,810	5,160

Bağımlı değişken = Hipertansiyon Öz Etkililik Toplam, R = 0,639; R^2 = 0,406; F = 171,206; P = 0,000; Durbin Watson Değeri = 1,624. KFİÖ, Kan Basıncı Farkındalığı ve İçgörü Ölçeği.

Tablo 5. Kan basıncı farkındalığı ve içgörü ve hipertansiyon öz etkililik puanlarının tanımlayıcı özelliklere göre farklılaşma durumu (n = 250)

Demografik özellikler	n	KFİÖ ortalama toplam	Semptomların katkılarının farkındalığı	Genel hastalık farkındalığı	Tedavi gereksinimi farkındalığı	Olumsuz sonuçların farkındalığı	Hipertansiyon öz etkililik toplam
		X̄ ± SS	X̄ ± SS	X̄ ± SS	X̄ ± SS	X̄ ± SS	X̄ ± SS
Yaş							
40 ve altı	29	8,46 ± 1,21	9,39 ± 1,59	8,56 ± 1,94	6,82 ± 1,35	9,52 ± 1,09	68,28 ± 9,32
41-50	70	7,16 ± 1,62	7,76 ± 2,90	6,57 ± 2,47	6,53 ± 0,99	8,30 ± 1,85	63,31 ± 10,81
51-60	98	7,68 ± 1,44	8,00 ± 2,48	7,33 ± 2,32	6,68 ± 1,01	8,83 ± 1,62	63,04 ± 10,63
61 ve üstü	53	7,92 ± 1,20	8,53 ± 2,00	7,45 ± 2,23	6,82 ± 0,76	9,08 ± 1,60	67,51 ± 8,63
F		6,507	2,918	5,330	1,068	4,547	3,864
P		**0,000**	**0,035**	**0,001**	0,363	**0,004**	**0,010**
Post-hoc		1 > 2, 3 > 2, 4 > 2, 1 > 3 (P < 0,05)	1 > 2, 1 > 3 (P < 0,05)	1 > 2, 3 > 2, 4 > 2, 1 > 3, 1 > 4 (P < 0,05)		1 > 2, 3 > 2, 4 > 2, 1 > 3 (P < 0,05)	1 > 2, 4 > 2, 1 > 3, 4 > 3 (P < 0,05)
Cinsiyet							
Kadın	137	7,97 ± 1,29	8,66 ± 2,14	7,52 ± 2,37	6,79 ± 0,85	9,22 ± 1,38	67,83 ± 8,22
Erkek	113	7,33 ± 1,60	7,67 ± 2,68	7,01 ± 2,35	6,56 ± 1,16	8,32 ± 1,85	60,84 ± 11,30
t		3,494	2,969	1,702	1,749	4,397	5,653
P		**0,001**	**0,004**	0,090	0,091	**0,000**	**0,000**
BKİ							
Normal	51	8,22 ± 1,20	9,17 ± 1,67	8,34 ± 2,07	6,42 ± 1,05	9,27 ± 1,33	70,53 ± 8,64
Fazla kilolu	124	7,36 ± 1,54	7,93 ± 2,59	6,87 ± 2,42	6,55 ± 0,91	8,46 ± 1,78	63,07 ± 10,60
Obez ve Üzeri	75	7,83 ± 1,40	8,03 ± 2,52	7,25 ± 2,28	7,10 ± 1,02	9,08 ± 1,57	63,33 ± 9,57
F		7,056	4,170	7,300	9,986	5,907	11,183
P		**0,001**	**0,017**	**0,001**	**0,000**	**0,003**	**0,000**
Post-hoc		1 > 2, 3 > 2 (P < 0,05)	1 > 2, 1 > 3 (P < 0,05)	1 > 2, 1 > 3 (P < 0,05)	3 > 1, 3 > 2 (P < 0,05)	1 > 2, 3 > 2 (P < 0,05)	1 > 2, 1 > 3 (P < 0,05)
Kan basıncı							
Normal	63	6,23 ± 0,90	6,03 ± 2,59	4,55 ± 0,81	6,37 ± 0,87	7,89 ± 1,80	63,05 ± 9,14
Yüksek	78	7,39 ± 1,34	7,71 ± 2,42	6,67 ± 1,80	6,77 ± 1,18	8,49 ± 1,81	61,04 ± 11,02
Çok yüksek	109	8,71 ± 0,93	9,20 ± 1,84	9,31 ± 1,21	6,81 ± 0,91	9,58 ± 1,03	68,21 ± 9,34
F		111,601	27,621	261,721	4,294	27,353	13,206
P		**0,000**	**0,000**	**0,000**	**0,015**	**0,000**	**0,000**
Post-hoc		2 > 1, 3 > 1, 3 > 2 (P < 0,05)	2 > 1, 3 > 1, 3 > 2 (P < 0,05)	2 > 1, 3 > 1, 3 > 2 (P < 0,05)	2 > 1, 3 > 1 (P < 0,05)	2 > 1, 3 > 1, 3 > 2 (P < 0,05)	3 > 1, 3 > 2 (P < 0,05)
Sigara kullanımı							
Evet	61	7,45 ± 1,58	7,47 ± 2,83	7,03 ± 2,32	6,85 ± 1,10	8,57 ± 1,59	58,48 ± 11,53
Hayır	156	7,76 ± 1,46	8,61 ± 2,22	7,33 ± 2,46	6,64 ± 0,96	8,92 ± 1,64	67,19 ± 8,69
Bırakmış	33	7,71 ± 1,31	7,97 ± 2,28	7,55 ± 2,02	6,60 ± 1,05	8,76 ± 1,95	64,21 ± 10,46
F		0,947	4,427	0,589	1,142	0,945	17,801
P		0,389	**0,013**	0,556	0,321	0,390	**0,000**
Post-hoc			2 > 1 (P < 0,05)				2 > 1, 3 > 1 (P < 0,05)
Alkol kullanımı							
Evet	30	7,78 ± 1,83	8,58 ± 2,28	7,76 ± 2,41	6,64 ± 1,52	8,70 ± 1,84	60,23 ± 12,98
Hayır	220	7,66 ± 1,42	8,16 ± 2,47	7,22 ± 2,36	6,69 ± 0,92	8,83 ± 1,65	65,28 ± 9,78
t		0,416	0,788	1,161	-0,237	-0,391	-2,539
P		0,734	0,432	0,247	0,871	0,696	**0,048**
Ek hastalık varlığı							
Var	113	7,18 ± 1,27	7,22 ± 2,49	6,35 ± 1,98	6,77 ± 0,88	8,44 ± 1,60	60,45 ± 9,82
Yok	137	8,09 ± 1,50	9,11 ± 2,02	8,06 ± 2,39	6,61 ± 1,10	9,12 ± 1,67	68,15 ± 9,41
t		-5,080	-5,984	-6,063	1,252	-3,238	-6,316
P		**0,000**	**0,000**	**0,000**	**0,212**	**0,001**	**0,000**

KFİÖ, Kan Basıncı Farkındalığı ve İçgörü Ölçeği; SS, Standart sapma; F, ANOVA Testi; t, Bağımsız Gruplar T-Testi; *Post-hoc*,Tukey, LSD.

Bir sistematik derlemede hipertansif bireylerde cinsiyetin kan basıncını kontrol etme ile ilişkili önemli bir faktör olduğu belirtilmiş olup erkeklerde kan basıncı farkındalığının azaldığı ve kadınların öz etkililik düzeylerinin erkeklere göre daha yüksek olduğu bildirilmiştir.[28] Yapılan başka bir çalışmada ise erkek cinsiyet daha yüksek bir öz etkililik düzeyi ile ilişkilendirilmiştir.[19] Bu çalışmada da kan basıncı farkındalığı (P = 0,001) ve hipertansiyon öz etkililik (P = 0,000) düzeylerinin erkeklere göre kadınlarda daha yüksek olduğu bulundu (Tablo 5).

Bir sistematik derlemede hipertansif bireylerde vücut ağırlığını kontrol etme konusunda daha bilinçli olan bireylerin kan basıncı kontrolünün daha iyi olduğu bildirilmiştir.[28] Yapılan başka bir çalışmada daha düşük beden kitle indeksi olan bireylerin öz etkililik düzeyleri daha yüksek bulunmuştur.[20] Khairy ve arkadaşları[19] tarafından yapılan bir çalışmada da beden kitle indeksi normal olan bireylerin öz etkililik düzeyinin fazla kilolu ve obez bireylere göre daha yüksek olduğu bildirilmiştir. Bu çalışmada da literatürdeki diğer çalışmalara benzer olarak normal beden kitle indeksi olan bireylerin kan basıncı farkındalığı (P = 0,001) ve öz etkililik (P = 0,000) düzeylerinin fazla kilolu ve obez bireylere göre daha yüksek olduğu bulundu (Tablo 5). Bu çalışma sonucuna göre kan basıncı farkındalığı ve öz etkililik düzeyinin yüksek olmasının beden kitle indeksi düzeyini normal sınırlarda tutmak için etkili olduğu görülmektedir.

Literatürde komorbiditesi olan bireylerin tedaviye uyumunun daha düşük olduğu gösterilmiştir.[28] Yapılan bir çalışmada benzer şekilde ek hastalığı olmayan grubun öz etkililik düzeyinin ek hastalığı olanlardan daha yüksek olduğu bildirilmiştir.[15] Bu çalışmada da literatürle benzer olarak ek hastalığı olmayan grubun öz etkililik düzeyinin ek hastalığı olanlardan daha yüksek olduğu bulundu (P = 0,000) (Tablo 5).

Çalışmanın Sınırlılıkları

Çalışmanın bir ilde bulunan sadece bir tane aile sağlığı merkezinde yapılması örneklemi kısıtlayabileceği için çalışmanın sınırlılığıdır. Araştırma sonuçları sadece bu çalışma grubuna genellenebilir.

Sonuç

Çalışmada hipertansif bireylerin öz etkililik düzeylerinin orta düzeyin üzerinde olduğu, kan basıncı farkındalığı ve içgörü düzeylerinin ise yüksek düzeyde olduğu bulundu. Bu çalışma sonucuna göre bireylerde kan basıncı farkındalığının yüksek düzeyde olmasının öz etkililik düzeyinin artması ve tedaviye uyumun sağlanması için etkili olduğu görülmektedir. Öz etkililik düzeyinin hipertansiyonun yönetiminde ve kontrol altına alınmasında önemli bir yeri vardır. Bu nedenle bireylerin kan basıncı farkındalık ve içgörülerinin artırılması için belli aralıklarla eğitim programlarının planlanması ve bireylerin katılımının teşvik edilmesi önerilmektedir.

Etik Kurul Onayı: Araştırma için Bartın Üniversitesi Sosyal ve Beşeri Bilimler Etik Kurulu'ndan onay alındı (Protokol Numarası: 2023-SBB-0768, Karar Sayısı: 1, Toplantı Tarihi: 11.12.2023).

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1. McEvoy JW, McCarthy CP, Bruno RM, et al.; ESC Scientific Document Group. 2024 ESC Guidelines for the management of elevated blood pressure and hypertension. *Eur Heart J*. 2024;45(38):3912-4018. Erratum in: *Eur Heart J*. 2025;46(14):1300. [CrossRef]
2. Silva BV, Sousa C, Caldeira D, Abreu A, Pinto FJ. Management of arterial hypertension: Challenges and opportunities. *Clin Cardiol*. 2022;45(11):1094-1099. [CrossRef]
3. Türkiye İstatistik Kurumu (TÜİK). Ölüm ve Ölüm Nedeni İstatistikleri. 2023. Accessed May 23, 2025. https://data.tuik.gov.tr/Bulten/Index?p = Olum-ve-Olum-Nedeni-Istatistikleri-2023-53709
4. Arslantaş EE, Sevinç N, Çetinkaya F, Günay O, Aykut M. Attitudes and practices of hypertensive patients on hypertension. *Ege Tıp Dergisi*. 2019;58(4):319-329. Turkish. [CrossRef]
5. Nugroho P, Andrew H, Kohar K, Noor CA, Sutranto AL. Comparison between the world health organization (WHO) and international society of hypertension (ISH) guidelines for hypertension. *Ann Med*. 2022;54(1):837-845. [CrossRef]
6. Arıkan A, Aydın A, Ekerbiçer HÇ, et al. Knowledge Level Of Hypertension Diagnosed Patients About Hypertension and Related Factors. *Sakarya Med J*. 2020;10(Özel Sayı):33-40. Turkish.
7. Hani SB, Abu Sabra MA, Alhalabi MN, Alomari AE, Abu Aqoulah EA. Exploring the Level of Self-Care Behavior, Motivation, and Self-Efficacy among Individuals With Hypertension: A Cross-Sectional Study. *SAGE Open Nurs*. 2024;10:23779608241257823. [CrossRef]

8. Türkoğlu N, Kılıç D. Turkish Reliability and Validity Study of the Hypertension Self-Efficacy Scale. *Turk J Card Nur*. 2021;12(29):190-195. [CrossRef]
9. Pirasath S, Kumanan T, Guruparan M. A Study on Knowledge, Awareness, and Medication Adherence in Patients with Hypertension from a Tertiary Care Centre from Northern Sri Lanka. *Int J Hypertens*. 2017;2017:9656450. [CrossRef]
10. Gerretsen P, Kim J, Shah P, et al. BASIS: The blood pressure awareness and insight scale. *J Clin Hypertens (Greenwich)*. 2018;20(4):748-756. [CrossRef]
11. Yılmaz M, Ağartıoğlu Kundakçı G, Uyanık G, Pamuk G, Koç E. The Blood Pressure Awareness and Insight Scale (BASIS): The Study of Validity and Reability. *STED*. 2022;31(2):134-141. Turkish.
12. Melin J, Fors A, Jakobsson S, Krabbe D, Björkman I. Self-Efficacy to Manage Chronic Disease (SEMCD) scale: translation and evaluation of measurement properties for a swedish version. *Arch Public Health*. 2023;81(1):2. [CrossRef]
13. Han HR, Lee H, Commodore-Mensah Y, Kim M. Development and validation of the Hypertension Self-care Profile: a practical tool to measure hypertension self-care. *J Cardiovasc Nurs*. 2014;29(3):E11-E20. [CrossRef]
14. Tan FCJH, Oka P, Dambha-Miller H, Tan NC. The association between self-efficacy and self-care in essential hypertension: a systematic review. *BMC Fam Pract*. 2021;22(1):44. [CrossRef]
15. Giena VP, Thongpat S, Nitirat P. Predictors of health-promoting behaviour among older adults with hypertension in Indonesia. *Int J Nurs Sci*. 2018;5(2):201-205. Erratum in: *Int J Nurs Sci*. 2020;8(1):V. [CrossRef]
16. Başol Y, Özer Z. Investigation of Depression Levels, Self-Efficacy, and Self-Care Ability in Hypertensive Patients. *Turk J Card Nur*. 2025;16(39):40-48. Turkish. [CrossRef]
17. Sarfika R, Sulistiawati, Afriyanti E, Saifudin IMMY. Self-care behavior among adult patients with hypertension in Padang, West Sumatra, Indonesia: A cross-sectional study. *Belitung Nurs J*. 2023;9(6):595-602. [CrossRef]
18. Darvishpour A, Mansour-Ghanaei R, Mansouri F. The Relationship Between Health Literacy, Self-Efficacy, and Self-Care Behaviors in Older Adults With Hypertension in the North of Iran. *Health Lit Res Pract*. 2022;6(4):e262-e269. [CrossRef]
19. Khairy S, Aslan A, Samara AM, Mousa I, Alkaiyat AS, Zyoud SH. Factors associated with self-efficacy in patients with hypertension: a cross-sectional study from Palestine. *J Health Popul Nutr*. 2021;40(1):1. [CrossRef]
20. Wee YS, Koh YLE, Tan NC. Assessment and stratification of self-care profile of patients with essential hypertension. *Singapore Med J*. 2024;65(8):459-465. [CrossRef]
21. Demirbaş N, Kutlu R. Treatment adherence and self-efficacy levels of adults using multiple drugs. *Ankara Med J*. 2020;20(2):269-280. [CrossRef]
22. Sari EA, Mirwanti R, Herliani YK, Pratiwi SH. Self-Care Behavior Based on Knowledge of Patients with Hypertension: A Cross-Sectional Study. *Vasc Health Risk Manag*. 2025;21:17-24. [CrossRef]
23. Konlan KD, Shin J. Determinants of Self-Care and Home-Based Management of Hypertension: An Integrative Review. *Glob Heart*. 2023;18(1):16. [CrossRef]
24. Zhang M, Shi Y, Zhou B, et al. Prevalence, awareness, treatment, and control of hypertension in China, 2004-18: findings from six rounds of a national survey. *BMJ*. 2023;380:e071952. [CrossRef]
25. Terzi H, Ayaz-Alkaya S, Yeşilyurt E. Healthy Life Awareness, Blood Pressure Awareness and Insight Among Adult Individuals: A Population-Based Cross-Sectional Study. *Public Health Nurs*. 2025;42(1):87-94. [CrossRef]
26. Jeong YW. Blood Pressure Awareness and Knowledge of Cardio-Cerebrovascular Diseases in South Korean Women with Hypertension. *Healthcare (Basel)*. 2021;9(3):360. [CrossRef]
27. Karakuş Özen İ, Ersin F. Investigation of the Health Literacy and Medication Adherence SelfEfficacy Levels of Individuals with A Diagnosis of Hypertension. *YBH Derg*. 2024;5(1):138-156. [CrossRef]
28. Teke N, Arslan S. Hypertensive Individuals's Medication Adherence Self Efficacy Level in Rural Population and Determination of the Affeting Factors. *DEUHFED*. 2018;11(2):120-128. Turkish.

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Development and Evaluation of Nurses' Cardiac Implantable Electronic Devices-Related Knowledge Scale

Hemşirelerin İmplante Edilebilir Kardiyak Cihaz Hakkında Bilgi Düzeyi Ölçeğinin Geliştirilmesi ve Değerlendirilmesi

ABSTRACT

Objective: Nurses who work as part of a multidisciplinary team caring for patients with cardiac implantable electronic devices (CIEDs) are required to have sufficient and accurate knowledge regarding CIEDs. This study aimed to develop and evaluate the reliability and validity of a scale designed to measure nurses' CIED-related knowledge.

Method: This cross-sectional descriptive study included 202 nurses who care for cardiovascular patients across four hospitals. The scale's reliability was evaluated using the Kuder–Richardson 20 (KR-20) reliability coefficient, intraclass correlation coefficient, and corrected item–total correlation analysis. Validity was assessed through the content validity index (CVI), predictive validity, and item discrimination index.

Results: Reliability analyses indicated that both the KR-20 reliability coefficient and the intraclass correlation coefficient demonstrated good reliability. Two items with correlation coefficients below 0.20 were removed. The scale-level CVI was 0.99. The item discrimination power ranged from poor to excellent. According to the predictive validity analysis, the type of ward on which nurses worked and the length of experience in the current ward predicted the total score, whereas education level did not.

Conclusion: The scale was found to be a reliable and valid instrument for measuring nurses' CIED-related knowledge in daily practice.

Keywords: Cardiac implantable electronic devices, nurses' knowledge, psychometric testing, reliability, validity

ÖZET

Amaç: İmplante edilebilir kardiyak cihazı olan hastaların bakımı için multidisipliner bir ekibin parçası olan hemşirelerin, cihazlar hakkında yeterli ve doğru bilgiye sahip olmaları gerekir. Çalışmanın amacı, Hemşirelerin İmplante Edilebilir Kardiyak Cihaz Hakkında Bilgi Düzeyi Ölçeği'ni geliştirmek ve geçerliği ile güvenirliğini test etmektir.

Yöntem: Kesitsel tanımlayıcı tipteki çalışmaya, dört hastaneden kardiyovasküler hastalara bakım veren 202 hemşire dahil edilmiştir. Ölçeğin güvenirliği, Kuder Richardson-20 güvenilirlik katsayısı, sınıf içi korelasyon katsayısı ve düzeltilmiş madde-toplam ölçek korelasyon analizi ile değerlendirilmiştir. Geçerlilik, kapsam geçerlilik indeksi, yordayıcı geçerlilik ve madde ayırt edicilik indeksi kullanılarak değerlendirilmiştir.

Bulgular: Güvenilirlik analizleri, Kuder Richardson-20 güvenirlik katsayısının ve sınıf içi korelasyon katsayısının iyi güvenirlik gösterdiğini ortaya koymuştur. Korelasyon katsayıları 0,20'nin altında olan iki madde çıkarılmıştır. Ölçeğin kapsam geçerlilik indeksi 0,99'dur. Madde ayırt edicilik gücü, zayıftan mükemmele kadar değişmektedir. Yordayıcı geçerlilik analizi sonuçlarına göre, hemşirelerin çalıştığı servis türü ve mevcut servisteki deneyim süresi toplam puanı öngörürken, eğitim düzeyi öngörmemiştir.

Sonuç: İmplante edilebilir kardiyak cihazlarla ilgili bilgi ölçeğinin, hemşirelerin günlük pratikte bilgisini ölçmek için güvenilir ve geçerli bir ölçek olduğu bulunmuştur.

Anahtar Kelimeler: İmplante edilebilir kardiyak elektronik cihazlar, hemşire bilgisi, psikometrik testler, güvenilirlik, geçerlilik

ORIGINAL ARTICLE
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Introduction

The umbrella term cardiac implantable electronic devices (CIEDs) includes implantable cardioverter defibrillators (ICDs), permanent pacemakers (PPMs), and cardiac

resynchronization therapy (CRT). These are widely used treatments for rhythm disorders, heart failure, and the prevention of sudden cardiac death.[1,2] Patients require comprehensive education at discharge to manage their new devices effectively and to avoid complications such as lead dislodgement,[1] or frozen shoulder,[3] electromagnetic interference (EMI),[4] and psychological effects like anxiety,[5,6] and depression.[7]

Recent guidelines emphasize the importance of educating and monitoring patients with CIEDs, advocating for a multidisciplinary team approach involving electrophysiologists, cardiologists, nurses, psychologists, dieticians, and pharmacists.[1] Nurses are a vital part of this team and must be knowledgeable about the indications for all types of CIEDs, as well as all aspects of living with these devices—including managing shock delivery, physical restrictions, and the clinical care of patients with CIEDs.[8] Enhancing nurses' knowledge contributes to patient safety by helping prevent complications such as inappropriate shocks, frozen shoulders, or lead dislodgement.

In this context, developing a reliable and valid scale to measure nurses' CIED-related knowledge is essential. Such a scale can support both self-assessment and serve as a tool for clinical nurse managers to organize targeted educational programs, address specific knowledge gaps, and ensure the continued competence of nursing staff. Furthermore, nursing education leaders and nurse educators can use the scale to evaluate CIED knowledge in relevant courses and as a guide for curriculum planning.

Therefore, the present study aimed to develop and evaluate the psychometric properties of a scale designed to measure nurses' CIED-related knowledge.

Methods

Scale Development Process

Researchers developed an initial item pool consisting of 84 items based on a literature review, which involved searching electronic databases including PubMed, CINAHL, MEDLINE, and Scopus. The review was conducted using the following keywords: "cardiac implantable electronic devices," "pacemaker," "implantable cardioverter-defibrillator," "cardiac resynchronization therapy," "nurses' knowledge," and "nursing care of patients with CIEDs." This process identified key topics such as indications for CIEDs,[1,2] care of the incision area,[9] restrictions on daily activities,[1] sports and exercise,[10] medical procedures,[11] shock plans,[12] electromagnetic interference (EMI), device ID cards, and follow-up.[1,13]

The item pool was transformed into a draft scale with three response options: "True," "False," and "I don't know," which was used to gather expert opinions and calculate the content validity index (CVI). A True/False design was selected, as the multiple-choice question format offers no significant advantages over it.[14] The "I don't know" option was included to reduce the likelihood of respondents guessing answers inaccurately.

According to Grant and Davis'[15] guidelines, between 2 and 20 expert opinions are recommended when determining a scale's CVI.[16] In this study, the expert panel consisted of eleven professionals: two cardiovascular nurses, three cardiologists, three cardiac device technicians, and three academic experts in cardiovascular nursing. The CVI was calculated using the Davis technique, in which experts rate items on a scale from 1 (not relevant) to 4 (highly relevant).[15] The CVI is determined by dividing the number of experts who selected a rating of 3 or 4 by the total number of experts.

Fifty-four items that were either similar to others or had a CVI below 0.80 were removed, resulting in a 30-item draft scale. This version was then reviewed by another expert panel composed of two cardiovascular nurses, three cardiologists, three cardiac device technicians, and one academic expert in cardiovascular nursing. The panel did not recommend any further changes, and all 30 items were retained.

The finalized 30-item Nurses' Cardiac Implantable Electronic Devices-Related Knowledge Scale was then used for evaluation (Figure 1).

MAIN POINTS

- Nurses' knowledge about cardiac implantable electronic devices (CIEDs) is typically measured using questionnaires, but no standardized scale currently exists. Therefore, the scale developed in this study contributes to the standardized measurement of nurses' knowledge about CIEDs.
- The scale is both valid and reliable for assessing nurses' knowledge of CIEDs.
- It can be used in daily practice to evaluate nurses' knowledge of CIEDs.

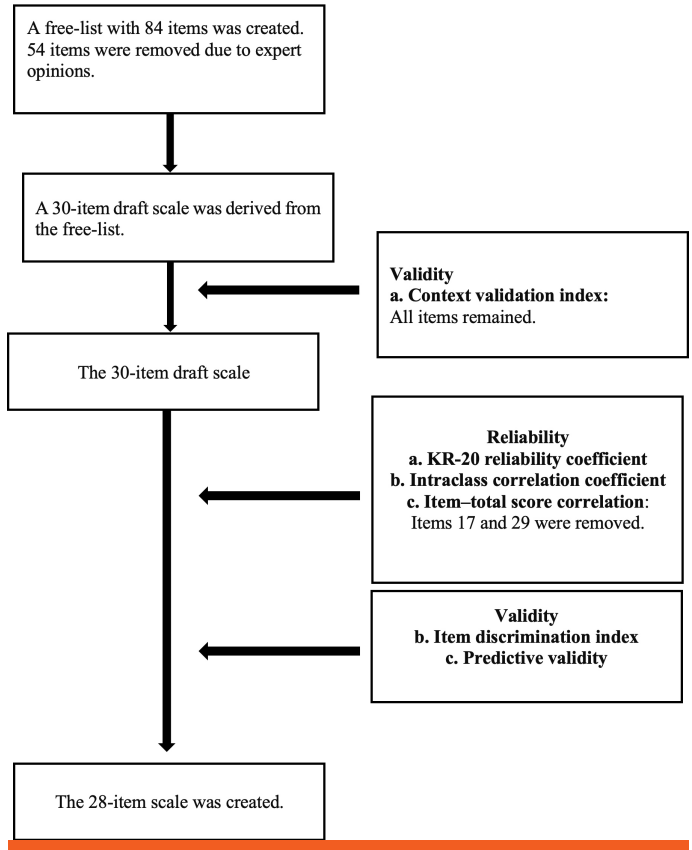

Figure 1. Scale development process.

Design and Sample

This cross-sectional descriptive study was conducted with nurses from four hospitals in the city who met the inclusion criteria. The criteria were current employment in a clinical ward for at least six months, voluntary participation in the study, and no communication difficulties. Participants were recruited from the cardiology ward, coronary intensive care unit, and other units including cardiology outpatient clinics, the emergency department, and the catheterization laboratory. For studies of this nature, a minimum sample size of 200 participants is recommended.[17] In this study, 211 nurses were approached, and 202 who voluntarily agreed to participate were included. The research instruments were administered in the hospitals during working hours, with an average completion time of 20 minutes.

Data Collection Tools

Sociodemographic Characteristics Form

The researchers developed a sociodemographic characteristics form consisting of eight questions on age, gender, education level, income status, marital status, current ward, length of experience in the current ward, and overall nursing experience.

Final Version of the Nurses' Cardiac Implantable Electronic Devices-Related Knowledge Scale

The final scale included 28 items addressing topics such as CIED indications, wound care, and post-discharge instructions related to daily activity restrictions, EMI, and similar concerns. Participants responded to each statement with one of three options: "True," "False," or "I do not know." One point was awarded for each correct response, and zero points for incorrect or "I do not know" responses. A total score was calculated by summing all responses, with possible scores ranging from 0 to 28. The cut-off scores were determined by quartile analysis of the minimum and maximum scores: 0–14 indicated inadequate knowledge, 15–21 indicated medium knowledge, and 22–28 indicated adequate knowledge.

Data Analysis

Data analysis was conducted using SPSS version 24 (IBM Corp., Armonk, NY, USA). Descriptive data were analyzed using frequency, percentage, mean, and standard deviation. The significance level was set at 0.05. Since the scale included dichotomous variables, reliability was assessed using the Kuder–Richardson 20 (KR-20) reliability coefficient,[15,18] intraclass correlation coefficient (ICC),[19] and corrected item–total correlations.[20] Validity was evaluated using content validity, predictive validity, and the item discrimination index.

Reliability

Internal consistency was assessed with the KR-20 reliability coefficient and the intraclass correlation coefficient (ICC). KR-20 values are interpreted as follows: ≥ 0.70 is acceptable, ≥ 0.80 is good, and ≥ 0.90 is very good.[15,18] ICC values are classified as: < 0.5 = poor, 0.5–0.75 = moderate, 0.75–0.90 = good, and > 0.90 = excellent.[19] The correlation between individual items and the overall scale was determined using corrected item–total correlation analysis, with acceptable values ranging from 0.20 to 0.50.[15,20]

Validity

Content validity was used to evaluate interpretive validity. The content validity index (CVI) was calculated, with values ≥ 0.80 considered valid.[15,16] Predictive validity was assessed to determine whether factors that may influence nurses' knowledge could predict future scale scores. Multiple regression analysis was conducted, with ward type, length of experience in the current ward, and education level as independent variables, and the total knowledge score as the dependent variable.[21,22] Ward type was categorized as either cardiology/coronary intensive care unit or other wards. Education level was coded as follows: high school graduate or associate degree = 0, and bachelor's degree or postgraduate level = 1.

The item discrimination index was calculated to evaluate each item's ability to distinguish between groups. The formula was:

D_i = (GA correct answers – GB correct answers) / N largest group

- D_i: discrimination index of item
- GA correct answers: number of correct responses to item i among participants in the top 27%
- GB correct answers: number of correct responses to item i among participants in the bottom 27%
- N largest group: number of participants in the larger of the two groups (GA or GB)

Interpretation of the item discrimination index values is as follows: > 0.39 = excellent, 0.30–0.39 = good, 0.20–0.29 = mediocre, and 0.00–0.20 = poor.[23]

Ethical Considerations

Ethical approval for the research was obtained from Dokuz Eylül University Non-Interventional Clinical Research Ethics Committee (approval number: 2019/03-14, date: 13.02.2019). Institutional permissions were also secured from the participating hospitals. All participants were provided with sufficient information about the study and gave informed consent. The research was conducted in accordance with the Declaration of Helsinki.

Results

The mean age of the nurses was 33.18 ± 7.29 years. Among the participants, 83.7% were female, 52.5% were married, 88.6% held a bachelor's degree, and 77.2% worked in the coronary intensive care unit or cardiology ward. The mean length of professional nursing experience was 127.4 ± 90.27 months, while the mean length of experience in the current ward was 76.29 ± 74.49 months.

Reliability

Reliability analysis showed that the KR-20 reliability coefficient and the intraclass correlation coefficient of the scale were 0.80. Corrected item–total score correlations ranged from –0.009 to 0.599. Items 17 and 29, which had values below 0.20, were removed. Although items 5, 6, 9, 11, 22, and 30 did not meet the criteria, they were retained because they addressed important issues not covered elsewhere. After these adjustments, the KR-20 reliability coefficient and the intraclass correlation for the 28-item scale were 0.81 (Table 1).

Table 1. Discrimination ability and internal consistency (n = 202)

Ite.	Phase 1 KR-20 (99% CI)	ICC (99% CI)	Corrected item-total score correlation	Phase 2 KR-20 (99% CI)	ICC (99% CI)	Item Discrimination Index
Total	0.80	0.80		0.81	0.81	
1			0.351			0.56
2			0.340			0.37
3			0.261			0.46
4			0.315			0.46
5			**0.082**			0.22
6			**0.180**			0.33
7			0.468			0.46
8			0.599			0.39
9			0.173			0.26
10			0.521			0.72
11			**0.078**			**0.11**
12			0.453			0.26
13			0.534			0.67
14			0.499			0.65
15			0.403			0.52
16			0.219			0.24
17			0.091			
18			0.339			0.24
19			0.481			0.67
20			0.454			0.76
21			0.364			0.50
22			**-0.009**			**0.02**
23			0.480			0.50
24			0.254			0.31
25			0.271			0.43
26			0.371			0.56
27			0.317			0.24
28			0.365			0.22
29			-0.153			
30			**0.120**			0.20

Ite, Items; ICC, Intraclass correlation; CI, Confidence interval.

Validity

The item-level CVI values ranged from 0.89 to 1.00, while the scale-level CVI for the 30-item draft scale was 0.99. The item discrimination index values ranged from 0.02 to 0.76. Although items 11 and 22 demonstrated poor discrimination power, they were retained because of their importance for nurses' CIED-related knowledge (Table 1). Multiple regression analysis indicated that ward type, length of experience in the current ward, and education level significantly influenced the total score ($P < 0.001$). Together, these three variables accounted for 28% of the variance in total knowledge scores. However, only ward type and length of ward experience were significant predictors of total knowledge, while education level was not (Table 2).

Table 2. The level of prediction of nurses' knowledge level of clinic and working duration (n = 202)

Variables	Beta	SE	β†	T‡	P
Constant	12.204	0.696		17.527	0.000
Ward	5.989	0.702	0.514	8.532	0.000
Length of experience	0.008	0.004	0.124	2.038	0.043
Education level	1.101	0.934	0.072	1.179	0.240
R§	0.533				
R2¶	0.284				
F¥	26.238				
P	0.000				

SE, Standard error; †, Standartized Beta; ‡, t-test value; §, Correlation co-efficient; ¶, R Square; ¥, ANOVA value.

Table 3. Characteristics of participants (n = 202)

Characteristics	X̄	SD
Age (year) (min-max: 20-54)	33.18	7.29
	n	**%**
Gender		
Male	33	16.3
Female	169	83.7
Marital status		
Married	106	52.5
Single	96	47.5
Education level		
Bachelor's degree	179	88.6
Postgraduate	23	11.4
Income status		
Income < Expense	73	36.1
Income = Expense	102	50.5
Income > Expense	27	13.4
Ward		
Coronary ıntensive unit/cardiology ward	156	77.2
Other departments	46	22.8
	X̄	**SD**
Length of experience (month)		
Current ward (min-max: 6-324)	76.29	
Nursing profession (min-max: 6-324)	127.44	
	n	**%**
Scale total score (min-max: 1 - 27)		
Inadequate	43	21.3
Medium	120	59.4
Adequate	39	19.3

SD, Standard deviation; Min, Minimum; Max, Maximum.

The Knowledge Level of the Nurses

The results of the study revealed that 21.3% of the nurses had an inadequate knowledge level, 59.4% had a medium level, and 19.3% had an adequate level (Table 3). Most nurses (80–90%) answered correctly on items related to ICD indications, arm

restrictions, undergoing MRI, and wound care. Fewer correct responses were provided for items concerning shock management, device ID cards, undergoing CT, passing through security systems in shopping malls, and follow-up. Only 52–65% of participants answered correctly on items regarding PPM and CRT indications, daily activities, undergoing chest X-rays, performing CPR on patients with CIEDs, and EMI (cell phones and flights).

Discussion

This study describes the development and evaluation of the Nurses' Cardiac Implantable Electronic Devices-Related Knowledge Scale, designed to measure nurses' knowledge of CIEDs.

For content validity, expert opinions were obtained. To confirm agreement among experts, it is recommended that the content validity index (CVI) be above 0.80. Fifty-four items that were either redundant or had a CVI below 0.80 were removed, leaving 30 items in the draft scale. The item-based CVI ranged from 0.89 to 1.00, and the scale-based CVI was 0.99 for the 30-item draft.

In this study, the KR-20 reliability coefficient and intraclass correlation coefficient (ICC) of the scale were both 0.80. KR-20 values above 0.80 are considered good,[15,18] and ICC values between 0.75 and 0.90 also indicate good reliability.[19] These results show that the scale had good reliability. Item–total score analysis, which evaluates whether scale items measure the intended concept, recommends a minimum correlation of 0.20.[15,20] Some items had corrected item–total correlations below this threshold; however, they were retained because of their importance for patient education and care. These included items on the shock plan (item 5), ROM exercises (item 9), device ID cards (item 6), swimming alone (item 11), security systems in shopping malls (item 22), and the follow-up schedule (item 30). These issues are critical for nurses' knowledge: developing a shock plan with patients helps prevent anxiety,[6,24,25] informing patients not to swim alone reduces isolation and risk of depression, addressing shopping mall security systems alleviates patient concerns,[26] teaching ROM exercises prevents complications such as frozen shoulder,[1,13] and reinforcing the importance of carrying a device ID card and adhering to follow-up improves patient safety and compliance.[13]

For items to remain in the scale, a discrimination index of at least 0.20 is recommended. In this study, discrimination power was adequate for all items except items 11 (swimming alone) and 22 (shopping malls). Despite their lower discrimination, these items were retained to counter misinformation, increase nurses' awareness, and enhance patient support.

The multiple regression analysis demonstrated that working in cardiology or coronary intensive care units, as well as longer ward experience, positively affected CIED-related knowledge. Experience in these units provides nurses with direct exposure to patients with CIEDs, reinforcing both practical knowledge and care skills. Similarly, longer ward experience increases familiarity with CIED care, thereby improving knowledge.[22,27] By contrast, education level did not affect knowledge scores. This finding suggests that nurses may not update their knowledge regularly, continuing outdated practices that may no longer be optimal.[21,22] It may also indicate that the nursing education curriculum is insufficient in covering CIED-related topics.

The study also revealed that a relatively low proportion of nurses achieved an adequate knowledge level, with about half demonstrating only medium knowledge. Notably, knowledge was limited regarding shock management, device ID cards, undergoing CT, negotiating security systems in shopping malls, and follow-up schedules. In addition, knowledge levels were inadequate in areas critical for clinical management, including PPM and CRT indications, device mechanisms, performing CPR on patients with CIEDs, and chest X-rays. These knowledge gaps suggest that many nurses may not be able to adequately educate or care for patients with CIEDs.[21,22,24]

Strengths and Limitations

A limitation of this study is that the scale was developed based on current knowledge of CIEDs. Future revisions may be required as new scientific and technological knowledge emerges. However, the study also had important strengths, including a large sample size and diversity of participants.

Conclusion

This study demonstrated that the 28-item Nurses' Cardiac Implantable Electronic Devices-Related Knowledge Scale provides reliable and valid evidence for measuring nurses' CIED-related knowledge. The scale can be confidently used for self-assessment in daily practice. Healthcare managers can apply it to identify nurses' knowledge levels and needs when designing training programs, thereby ensuring that nurses are better prepared to provide informed care and education for patients with CIEDs. In addition, the scale can serve as a resource for nursing educators in designing CIED-related components of curricula, helping ensure that future nurses enter the workforce with a strong foundation in this specialized field. Its use in both academic and clinical settings may contribute to standardizing CIED education and fostering a more competent nursing workforce.

Ethics Committee Approval: Ethics committee approval was obtained from Dokuz Eylül University Non-Interventional Clinical Research Ethics Committee (Approval Number: 2019/03-14, Date: 13.02.2019).

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References

1. Glikson M, Nielsen JC, Kronborg MB, et al.; ESC Scientific Document Group. 2021 ESC Guidelines on cardiac pacing and cardiac resynchronization therapy. *Eur Heart J*. 2021;42(35):3427-3520. Erratum in: *Eur Heart J*. 2022;43(17):1651. [CrossRef]
2. Zeppenfeld K, Tfelt-Hansen J, de Riva M, et al.; ESC Scientific Document Group. 2022 ESC Guidelines for the management of patients with ventricular arrhythmias and the prevention of sudden cardiac death. *Eur Heart J*. 2022;43(40):3997-4126. [CrossRef]
3. Cosgun MS, Cosgun C. Predictors of shoulder limitations and disability in patients with cardiac implantable electronic devices: Importance of device size. *Pacing Clin Electrophysiol*. 2021;44(12):1979-1986. [CrossRef]
4. Censi F, Mattei E, Onder G, Calcagnini G. iPhone 12 MagSafe technology and cardiac implantable devices: Assessment of the actual risk. *Pacing Clin Electrophysiol*. 2022;45(3):410-417. [CrossRef]
5. Mathew J, Sharma A, Naik N, Lakshmanan G. Physical and psychosocial concerns among patient living with implantable cardioverter defibrillator attending tertiary health care facility. *AJNER*. 2020;10(4):463-470. [CrossRef]
6. Ogawa T, Saito N, Fukuzawa K, et al. Device nurse intervention facilitates the patients' adaptation to cardiac shock devices in the remote monitoring era. *Pacing Clin Electrophysiol*. 2021;44(11):1874-1883. [CrossRef]
7. Auld JP, Thompson EA, Dougherty CM. Social cognitive intervention following an initial implantable cardioverter defibrillator: Better treatment response for secondary versus primary prevention. *Pacing Clin Electrophysiol*. 2020;43(9):974-982. [CrossRef]
8. Lombardo L, Wynne R, Hickman L, Ferguson C. New technologies call for new strategies for patient education. *Eur J Cardiovasc Nurs*. 2021;20(5):399-401. [CrossRef]
9. Blomström-Lundqvist C, Traykov V, Erba PA, et al.; ESC Scientific Document Group. European Heart Rhythm Association (EHRA) international consensus document on how to prevent, diagnose, and treat cardiac implantable electronic device infections-endorsed by the Heart Rhythm Society (HRS), the Asia Pacific Heart Rhythm Society (APHRS), the Latin American Heart Rhythm Society (LAHRS), International Society for Cardiovascular Infectious Diseases (ISCVID) and the European Society of Clinical Microbiology and Infectious Diseases (ESCMID) in collaboration with the European Association for Cardio-Thoracic Surgery (EACTS). *Eur J Cardiothorac Surg*. 2020;57(1):e1-e31. [CrossRef]
10. Pelliccia A, Sharma S, Gati S, et al.; ESC Scientific Document Group. 2020 ESC Guidelines on sports cardiology and exercise in patients with cardiovascular disease. *Eur Heart J*. 2021;42(1):17-96. Erratum in: *Eur Heart J*. 2021;42(5):548-549. [CrossRef]
11. Munawar DA, Chan JEZ, Emami M, et al. Magnetic resonance imaging in non-conditional pacemakers and implantable cardioverter-defibrillators: a systematic review and meta-analysis. *Europace*. 2020;22(2):288-298. [CrossRef]
12. Braunschweig F, Boriani G, Bauer A, et al. Management of patients receiving implantable cardiac defibrillator shocks: recommendations for acute and long-term patient management. *Europace*. 2010;12(12):1673-1690. [CrossRef]
13. Ammar SA, Hamza MF, Hariedy NGE. Effect of nursing guidelines on the severity of frozen shoulder among patient with artificial implanted pacemaker. *IJND*. 2019;9(11):12-19. [CrossRef]
14. Kline TJB. Psychological Testing: A Practical Approach to Design and Evaluation. 1st ed. Sage; 2005. [CrossRef]
15. Grant JS, Davis LL. Selection and use of content experts for instrument development. *Res Nurs Health*. 1997;20(3):269-274. [CrossRef]
16. Polit DF, Beck CT, Owen SV. Is the CVI an acceptable indicator of content validity? Appraisal and recommendations. *Res Nurs Health*. 2007;30(4):459-467. [CrossRef]
17. Gilbert GE, Prion S. Making sense of methods and measurement: Sample size issues for psychometric studies. *Clin Simul Nurs*. 2016;12(11):482-483. [CrossRef]
18. Souza AC, Alexandre NMC, Guirardello EB. Psychometric properties in instruments evaluation of reliability and validity. *Epidemiol Serv Saude*. 2017;26(3):649-659. English, Portuguese. [CrossRef]
19. Koo TK, Li MY. A Guideline of Selecting and Reporting Intraclass Correlation Coefficients for Reliability Research. *J Chiropr Med*. 2016;15(2):155-163. Erratum in: *J Chiropr Med*. 2017;16(4):346. [CrossRef]
20. Lissitz RW, Samuelsen K. A suggested change in terminology and emphasis regarding validity and education. *Educ Res*. 2007;36(8):437-448. [CrossRef]
21. Norekvål TM, Peersen LR, Seivaag K, Fridlund B, Wentzel-Larsen T. Temporal trend analysis of nurses' knowledge about implantable cardioverter defibrillators. *Nurs Crit Care*. 2015;20(3):146-154. [CrossRef]
22. Steffes SS, Thompson EA, Bridges EM, Dougherty CM. Knowledge of Implantable Cardioverter Defibrillator Purpose and Function Among Nurses in the United States. *J Cardiovasc Nurs*. 2017;32(3):304-310. [CrossRef]
23. Escudero EB, Reyna NL, Morales MR. The level of difficulty and discrimination power of the Basic Knowledge and Skills Examination (EXHCOBA). *REDIE*. 2000;2(1):2-16.
24. Pannag J, Martin L, Yost J, McGillion M, Carroll SL. Testing a nurse-led, pre-implantation educational intervention for primary prevention implantable cardioverter-defibrillator candidates: a randomized feasibility trial. *Eur J Cardiovasc Nurs*. 2021;20(4):367-375. [CrossRef]
25. Zartaloudi A, Pappa A. Anxiety and depression in implanted cardioverter defibrillator (ICD). *Perioper Nurs Q*. 2019;8(2):16-23.
26. Ismail MAM, Ibrahim NM, Che Hasan MK. What do our nurses know about managing patient with permanent pacemakers? *Jurnal Ners*. 2020;15(2):157-161. [CrossRef]
27. Ahmed AM, Taha NM, Zytoon HK, Mohammed MA. Nurses Role Regarding the Care of Patients with Permanent Pacemaker. *ZNJ*. 2021;17(2):161-174.

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Psychometric Evaluation of the Turkish Version of the Atrial Fibrillation Knowledge Scale

Atriyal Fibrilasyon Bilgi Ölçeğinin Türkçe Versiyonunun Psikometrik Değerlendirmesi

ABSTRACT

Objective: It is important to assess patients' knowledge and learning needs regarding atrial fibrillation (AF) and its management to minimize the risks associated with the disease. To date, the psychometric properties of the Atrial Fibrillation Knowledge Scale (AFKS) have only been tested in a Chinese-speaking sample. However, a validated and comprehensive tool for use among Turkish patients with AF has not yet been developed. This study aimed to determine the validity and reliability of the Turkish version of the AFKS in a Turkish population of patients with AF.

Method: This study was a cross-cultural adaptation of the AFKS to evaluate its psychometric properties in a Turkish population diagnosed with AF, in accordance with the methodology and recommendations of the International Commission on Testing.

Results: A total of 210 patients were included. The mean age of the patients was 62.25 ± 9.30 years, and the mean duration of the disease was 2.99 ± 1.70 years. Confirmatory factor analysis (CFA) results showed that the four factors identified in the original scale were validated in Turkish patients with AF. The CFA findings demonstrated that the factor loadings of the model indicated strong and significant associations between the items and the relevant factors ($P < 0.001$ for all items). The Cronbach's alpha reliability coefficient of the scale was 0.88. A positive, moderate correlation ($r = 0.48$, $P < 0.001$) was found between the AFKS and the Atrial Fibrillation Effect on QualiTy-of-life Questionnaire.

Conclusion: The findings of this study indicate that the scale is valid and reliable for use in Turkish patients with AF.

Keywords: Atrial fibrillation, knowledge, symptoms, reliability, validity

ÖZET

Amaç: Hastaların atriyal fibrilasyon (AF) ve yönetimi hakkındaki bilgi ve öğrenme ihtiyaçlarını değerlendirmek, hastalığın risklerini en aza indirmek için önemlidir. Atriyal Fibrilasyon Bilgi Ölçeği'nin (AFKS) psikometrik özellikleri bugüne kadar yalnızca Çince konuşan bir örneklemde test edilmiştir. Ancak, AF'li Türk hastalar arasında kullanılmak üzere doğrulanmış ve kapsamlı bir araç henüz geliştirilmemiştir. Bu çalışmada amacımız, AFKS'nin Türkçe versiyonunun AF'li Türk hasta popülasyonunda geçerlilik ve güvenilirliğini belirlemektir.

Yöntem: Bu çalışma, AFKS'nin psikometrik özelliklerini AF tanısı almış Türk popülasyonunda değerlendirmek amacıyla, metodoloji ve Uluslararası Test Komisyonu'nun önerileri doğrultusunda kültürler arası bir uyarlamadır.

Bulgular: Toplam 210 hasta çalışmaya dahil edilmiştir. Hastaların ortalama yaşı 62,25 ± 9,30 yıl ve ortalama hastalık süresi 2,99 ± 1,70 yıldır. Çalışmamızdaki doğrulayıcı faktör analizi (DFA) sonuçları, orijinal ölçekte ortaya çıkan dört faktörün Türk toplumundaki AF hastalarında doğrulandığını göstermiştir. DFA bulguları, modelin faktör yüklerinin, maddelerin ilgili faktörlerle güçlü ve anlamlı ilişkilere sahip olduğunu göstermiştir (tüm maddeler için $P < 0,001$). Ölçeğin Cronbach α güvenilirlik katsayısı 0,88'dir. AFKS ile Atriyal Fibrilasyonun Yaşam Kalitesine Etkisi Anketi arasında pozitif, orta düzeyde bir korelasyon ($r = 0,48$, $P < 0,001$) bulunmuştur.

Sonuç: Bu çalışmanın bulguları, ölçeğin AF'li Türk hastalarda kullanım için geçerli ve güvenilir olduğunu göstermektedir.

Anahtar Kelimeler: Atriyal fibrilasyon, bilgi, semptom, güvenilirlik, geçerlilik

ORIGINAL ARTICLE
KLİNİK ÇALIŞMA

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Introduction

Atrial fibrillation (AF) is a cardiac rhythm disorder with global prevalence.[1,2] It is characterized by an irregular heart rhythm, manifesting as a continuous or intermittent absence of P-wave activity on electrocardiographic tracing.[3] According to the American Heart Association, the prevalence of AF is estimated to be 33 million individuals worldwide, with approximately 5 million new cases identified annually on a global scale.[4] According to data from the Heart Disease and Risk Factors in Turkish Adults study conducted in Türkiye in 2006, the number of cases detected each year is 35,000.[5] The irregular heart rhythm of AF has been associated with an elevated risk of adverse outcomes, including ischemic stroke, heart failure, cognitive impairment, and mortality.[3] As a result, AF contributes to increased health expenditures and burden of care and has a negative impact on patients' quality of life.[6]

Individuals afflicted with AF frequently experience a range of symptoms, including but not limited to palpitations, dizziness, anxiety, restlessness, stress, fatigue, syncope, decreased exercise capacity, chest pain, and shortness of breath.[7] It is noteworthy that asymptomatic patients may be identified only after the emergence of serious AF-related complications, such as stroke, myocardial infarction, or heart failure.[8]

Accurate monitoring of heart rate and detection of heartbeats are crucial for effective treatment and adjustment of treatment as needed. Furthermore, controlling risk factors for AF, such as diabetes mellitus, hypertension, obesity, smoking, and alcohol intake, is essential to reduce the burden of the disease and prevent exacerbations.[9]

International guidelines emphasize a holistic approach to achieve positive outcomes in the treatment of AF. These guidelines state that patients' health outcomes can be improved with modifiable risk factors and dysrhythmia control.[3] In the context of AF, effective treatment and symptom control are crucial for enhancing quality of life. The prevailing challenges in current AF symptom control strategies include the inability to effectively manage and control the rate and rhythm of the heartbeat. This is further compounded by a lack of knowledge surrounding the effective execution and control of oral anticoagulation therapy.[10-13] In conclusion, effective communication with patients, providing education that encourages informed decision-making, and improving patients' self-management skills were identified as important steps.[14] The aforementioned self-management skills encompass self-monitoring and management of signs and symptoms, management of crises related to disease exacerbation and treatment complications, and lifestyle changes.[3]

Recognizing the lack of a comprehensive scale to assess the level of knowledge in patients with AF, Hendriks et al.[15] developed the Atrial Fibrillation Knowledge Scale (AFKS) for patients with AF. In general, the AFKS measures knowledge about recognizing the signs and symptoms of AF and its treatment. To date, the psychometric properties of the AFKS have been tested in a Chinese-speaking sample.[16] In Türkiye, there is no tool to measure AF knowledge that focuses on the disease, symptom recognition, and treatment together. As a result of the increasing prevalence of cardiovascular risk factors in our country, the number of individuals predisposed to AF has been rising rapidly in recent years. Therefore, there is a need for a tool that measures the knowledge level of patients with AF. In this study, our aim was to determine the validity and reliability of the AFKS in a Turkish population of patients with AF.

MAIN POINTS

- This study supports the reliability and validity of the Turkish version of the Atrial Fibrillation Knowledge Scale in patients with atrial fibrillation in Türkiye.
- The Turkish version of the Atrial Fibrillation Knowledge Scale can effectively measure patients' knowledge about the disease, symptom recognition, and treatment.
- Healthcare professionals require a validated tool to assess patients' knowledge of atrial fibrillation and to plan appropriate interventions. The Turkish version of the scale is a psychometrically sound instrument suitable for clinical use.

Methods

Translation Process

Permission was obtained from the developers of the AFKS for its translation from English to Turkish.[15] The language validity of the scale was assessed at three levels. Translation was performed based on established guidelines.[17-19] First, the translation and back-translation processes were conducted by the authors and a certified linguist who were both fluent in English and Turkish. Subsequently, the finalized Turkish translation was back-translated into English by another certified linguist, a native English speaker who had not seen the original version of the questionnaire. After necessary modifications were made to ensure conceptual equivalence, based on the linguist's recommendations, the scale was independently evaluated by five nursing professors. These experts were fluent in both Turkish and English, and familiar with the languages and cultures involved. This process ensures that the instrument reflects the underlying concept consistently across cultures and yields comparable results in different language populations.[20,21] The experts were also knowledgeable about the scale content and general scale principles, enabling them to perform a professional-quality translation and adaptation of the scale in line with the International Test Commission (ITC) guidelines.[17-19]

Study Design

This study was methodologically designed to assess the validity and reliability of the Turkish version of the AFKS in Turkish patients with AF. The stages of the study followed the COSMIN methodology and the 2018 guidelines of the ITC.[17-20]

Study Setting and Participants

The study sample consisted of individuals aged 18 years and older who were hospitalized in the cardiology outpatient clinic and inpatient service of a university hospital in Ankara and had a confirmed diagnosis of AF. Data were collected between May 2023 and November 2024 by a researcher. Participants were required to be of Turkish ethnic origin and able to communicate orally and in written Turkish.

Exclusion criteria included patients with dementia or severe psychological illness (excluding depression), patients unable to self-administer the questionnaire, and those with major uncorrected hearing or visual impairments. In line with ITC recommendations, a minimum of 110 participants was required for this study.[17]

Prior to the main study, a pilot study was conducted with 10 patients diagnosed with AF to assess the language validity of the scale. These patients were excluded from the final sample. Ultimately, 210 patients with AF were included in the study.

Data Collection

Data were collected using the Patient Form, the Turkish Atrial Fibrillation Knowledge Scale, and the Atrial Fibrillation Effect on QualiTy-of-life Questionnaire for concurrent validity testing. Patients were informed about the study, and it took approximately 15–20 minutes to complete the forms. The researcher was present with the patients during this process and obtained written informed consent from each participant after explaining the study's purpose and procedures. The study was conducted in accordance with the Declaration of Helsinki. All measurement tools were self-administered by the participants. Additionally, stroke risk data (calculated using the CHA_2DS_2-VASc score) were obtained from the patients' medical records by the researcher.

Measures

Patient Form

Demographic and clinical data were collected using a form consisting of eleven questions addressing patients' age, disease duration, sex, education level, marital status, employment status, monthly income, comorbidity status, medication use, types of AF, and CHA_2DS_2-VASc score.[15,16,22-24]

Atrial Fibrillation Knowledge Scale (AFKS)

The AFKS is an 11-item scale developed by Hendriks et al.[15] to assess knowledge of AF, symptom recognition, and treatment modalities. It consists of four dimensions: general (three items), treatment (three items), symptom recognition (three items), and general attitudes (two items). The scale is designed to assess the knowledge, symptoms, and treatment-related understanding experienced by AF patients. Participants are instructed to select one of three options in response to each item. One point is awarded for each correct answer, with no deduction for incorrect responses. The total score is calculated by summing the number of correct responses, with higher scores indicating greater knowledge. The Cronbach's alpha of the original scale was 0.58.[15]

Atrial Fibrillation Effect on Quality-of-Life Questionnaire (AFEQT)

The AFEQT was developed by Spertus et al.[25] in 2011, and its Turkish validity and reliability were confirmed by Güneş and Boyraz[24] in 2019. This questionnaire is designed to assess the quality of life in patients with AF. It contains 20 items grouped into four subscales: symptoms, daily activities, treatment concern, and treatment satisfaction. Subscale scores range from 0 to 100, with higher scores indicating better quality of life. The Cronbach's alpha value of the Turkish version of the scale was reported as 0.91.[24] In this study, the Cronbach's alpha value was found to be 0.96.

Data Analysis

The data obtained in this study were analyzed using IBM SPSS (Version 24.0, Armonk, NY, USA) and IBM SPSS AMOS 24 (IBM Corp., Armonk, NY, USA). Descriptive statistics were used to summarize the socio-demographic and clinical characteristics of the participants. Means and standard deviations were calculated for continuous variables, while frequencies and percentages were calculated for categorical variables.

For the AFKS, response frequencies, means, standard deviations, skewness, and kurtosis were calculated for each item to examine score distribution, normality, and ceiling and floor effects. The items were found to show a normal distribution.[26,27]

The Turkish content of each item in the AFKS was independently assessed for language and content validity by five experts, based on the Consensus-based Standards for the Selection of Health Measurement Instruments (COSMIN) guidelines.[17-19] Content validity was evaluated by calculating the item-content validity index (I-CVI) and scale-content validity index (S-CVI).[28]

Confirmatory factor analysis (CFA) was conducted to assess the construct validity of the scale using structural equation modeling (SEM).[28,29] Model fit was evaluated using the goodness-of-fit index (GFI), comparative fit index (CFI), root mean square residual (RMR), root mean square error of approximation (RMSEA), normed fit index (NFI), incremental fit index (IFI), Tucker-Lewis index (TLI), and Chi-square/degrees of freedom (χ^2/df) ratio. Construct validity was further assessed through hypothesis testing using Pearson correlation analysis.[20,25]

The internal consistency of the scale was measured using Cronbach's alpha reliability coefficient.[30] Acceptable thresholds for item-total and inter-item correlations were greater than 0.30. The scale's discriminative ability was evaluated by comparing the performance of two extreme groups (the lower and upper 27% of scores). Test-retest reliability was assessed using the intraclass correlation coefficient (ICC).[17]

Ethical Considerations

The original scale owner granted approval for the study via electronic correspondence. Prior to initiating the research, an application was submitted to the Lokman Hekim University Scientific Research Ethics Committee, and approval was obtained (Approval Number: 2023/83, Date: 16.05.2023). The researcher obtained written informed consent from each participant after providing a detailed explanation of the study's purpose and procedures. The study was conducted in accordance with the Declaration of Helsinki. No artificial intelligence programs were used in the data collection or article creation processes.

Results

Sample Characteristics

The study sample consisted of 210 individuals diagnosed with AF. The mean age of patients was 62.25 ± 9.30 years (range: 20 to 82 years), indicating a wide distribution of AF knowledge among participants. The mean disease duration was 2.99 ± 1.70 years.

Among the participants, 60% were male; 36.7% had completed university education; 84.8% were married; 70.0% were not employed; and 87.1% reported that their income was equal to

Table 1. Sample characteristics (n = 210)

Patients characteristics	n	%
Age, years ($\bar{x}$ ± SD)	62.25 ± 9.3	
Disease duration, ($\bar{x}$ ± SD)	2.99 ± 1.7	
Sex		
Female	84	40
Male	126	60
Graduation level		
Primary school - middle school	74	35.2
High school	59	28.1
University	77	36.7
Marital status		
Single	32	15.2
Married	178	84.8
Employment status		
Working	63	30
Not working	147	70
Monthly income		
Income equal to expenditure	183	87.1
Income more than expenditure	27	12.9
Comorbidities		
Hypertension	102	48.6
Coronary artery disease	66	31.4
Diabetes mellitus	21	10
Stroke	15	7.1
Chronic obstructive pulmonary disease	6	2.9
Medication use		
Anticoagulant	166	79.0
β-Blockers	33	15.7
Types of AF		
Paroxysmal	74	35.2
Persistent	7	3.3
Permanent	38	18.1
Undifferentiated	91	43.3
CHA_2DS_2-VASc score		
2	84	40
3	56	26.7
4	58	27.6
5	9	4.3
6	3	1.4

SD, Standard deviation; AF, Atrial fibrillation; CHA_2DS_2-VASc score, Stroke risk score.

their expenses. Regarding comorbidities, hypertension was the most common (48.6%), followed by coronary artery disease (31.4%) and diabetes (10.0%).

In terms of medication use, 79.0% of participants used anticoagulants, 15.7% used beta blockers, and 5.2% used calcium channel blockers. When analyzing the type of AF, the most common type was undefined AF (43.3%), followed by paroxysmal (35.2%), permanent (18.1%), and persistent AF (3.3%).

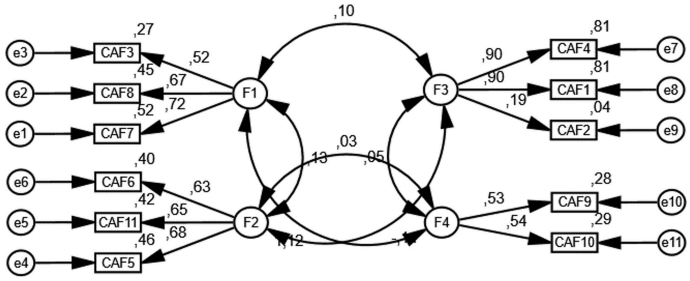

Figure 1. Path diagram of the Turkish version of the Atrial Fibrillation Knowledge Scale.

Regarding the CHA_2DS_2-VASc score distribution, 40.0% of the participants had a score of 2. The Turkish AFKS total score for participants was 6.94 ± 1.71 (Table 1).

Validity

Language and Content Validity

The experts (nursing professors) involved in the translation process were selected from different institutions to avoid bias. To assess the content validity of the scale, it was distributed via email to these experts, who were then asked to evaluate each item individually. Content validity was assessed using the Davis technique.[28] In this method, expert opinions are rated on a 4-point scale indicating whether an item represents the intended feature or not.

Five experts rated each scale item on a 4-point Likert scale, with 1 representing "not relevant" and 4 representing "highly relevant." Following the collection of expert opinions, the item-content validity index (I-CVI) and scale-content validity index (S-CVI) were calculated to assess content validity.[28-31] The content validity index was determined by dividing the number of experts who rated the item as relevant (ratings of 3 or 4) by the total number of experts. Items with a content validity index lower than 0.80 are typically removed from the scale.[17-19] However, all items in this scale had content validity index values above 0.80. Therefore, no items were removed from the scale.

Experts were also asked to suggest alternative wording for any items they deemed inappropriate. Based on their feedback, minor revisions were made to item 11, which initially had an I-CVI value lower than 1. In the original AFKS, item 11 read, "What is the function of the thrombosis centre?" This item was adapted to: "What is the purpose of regularly monitoring your blood values?" because thrombosis centers are not available in the country or the hospital where the study was conducted. Furthermore, the main function of such centers is to adjust medication doses based on blood test results.

Construct Validity

In this study, confirmatory factor analysis (CFA), in the form of structural equation modeling (SEM), was used to assess the relationship between observed and latent variables. In addition, goodness-of-fit indices were employed.[29] The CFA results are presented in the diagram (Figure 1).

Table 2. Confirmatory factor analysis for the Turkish version of the Atrial Fibrillation Knowledge Scale

Items	Factors	β	Std. β	S. Error	t	P
7. Atrial fibrillation is a rare condition	F1	0.719	1.000			
8. It is particularly risky if a person does not feel his/her atrial fibrillation	F1	0.669	0.901	0.115	7.842	< 0.001
3. If atrial fibrillation is identified without complaints, the patient should immediately visit hospital	F1	0.524	0.690	0.108	6.403	< 0.001
5. Why is oral anticoagulation prescribed for some AF patients?	F2	0.681	1.000			
11. What is the purpose of regularly monitoring your blood values?	F2	0.650	0.858	0.147	5.847	< 0.001
6. Why should a person using anticoagulants avoid alcohol?	F2	0.631	0.856	0.146	5.845	< 0.001
4. What is atrial fibrillation?	F3	0.899	1.000			
1. What are the trigger factors for atrial fibrillation?	F3	0.898	1.039	0.202	5.147	< 0.001
2. Why is it important to take my AF medication properly?	F3	0.194	0.223	0.086	2.602	0.009
9. Which statement regarding physical exercise is true for AF patients?	F4	0.533	1.000			
10. Which statement is true?	F4	0.543	1.177	0.193	6.090	< 0.001

Goodness fit	Acceptable value	Found value
χ^2		57.718
df		38
χ^2/df	$0 \leq \chi^2/df \leq 5$	1.519
CFI	$0.80 \leq CFI \leq 1.00$	0.965
GFI	$0.80 \leq GFI \leq 0.95$	0.955
NFI	$0.90 \leq NFI \leq 0.95$	0.906
IFI	$0.80 \leq IFI \leq 1.00$	
TLI	$0.80 \leq TLI \leq 1.00$	0.949
RMSEA	$0.05 \leq RMSEA \leq 0.08$	0.034
RMR	$0.05 \leq RMR \leq 0.08$	0.05

F1, Atrial fibrillation in general; F2, Atrial fibrillation treatment; F3, Atrial fibrillation symptoms recognition; F4, Atrial fibrillation general attitudes: χ^2, Chi square; df, Degrees of freedom; CFI, Comparative Fit Index; GFI, Goodness-of-fit index; NFI, Normed Fit Index; IFI, Improved Fit Index; TLI, Tucker-Lewis Index; RMSEA, Root mean square error of approximation; RMR, Root mean square residual.

The goodness-of-fit criteria used in this study are detailed in Table 2. The resulting χ^2 value was 57.718 with 38 degrees of freedom. The χ^2/df ratio, an essential measure of model fit, was calculated as 1.519, indicating an acceptable model fit. The comparative fit index (CFI) was 0.965, the goodness-of-fit index (GFI) was 0.955, the normed fit index (NFI) was 0.906, and the incremental fit index (IFI) was 0.966. These values exceed the recommended thresholds, indicating good model fit. The Tucker–Lewis index (TLI) was 0.949, which also falls within acceptable limits.

The root mean square error of approximation (RMSEA) value was 0.034, and the root mean square residual (RMR) value was 0.050. Both are below the recommended cut-off values, suggesting a satisfactory error rate. In summary, these findings support a well-fitting, coherent, and valid model structure (Table 2).

As shown in Table 2, the factor loadings demonstrate statistically significant correlations between all items and their corresponding factors (P < 0.001). This analysis was conducted to evaluate the construct validity of the scale and to confirm the appropriateness of each item in representing its intended factor. CFA was used to examine the strength and significance of loadings between observed variables and latent constructs, including standardized loadings, standard errors, t-values, and significance levels.

The results showed that all items had significant and high loadings on their respective factors. For example, item 7 loaded onto Factor F1 (atrial fibrillation in general) with a coefficient of 0.719 and was statistically significant (P < 0.001). Similarly, other items showed strong and significant loadings on their relevant factors. Notably, item 2 loaded onto Factor F3 (atrial fibrillation symptom recognition) with a coefficient of 0.194 but was still statistically significant (P = 0.009).

These collective findings indicate that the factor structure of the scale aligns with the data, thus supporting its construct validity. The statistically significant factor loadings further suggest that the items adequately represent the latent constructs they are intended to measure (Table 2).

Construct Validity Using Hypothesis Testing

Hypothesis testing was used to confirm construct validity by comparing the AFKS with another validated scale that measures a similar construct. Measurement validity in this context is based on concurrent validity—i.e., comparing the results obtained from the AFKS with those obtained from the AFEQT.[29]

The aim of this analysis was to test hypotheses previously proposed in the literature regarding treatment knowledge, symptom recognition, and awareness of AF. To this end, the AFKS

Table 3. Correlation between the Turkish Version of the Atrial Fibrillation Knowledge Scale and the Atrial Fibrillation Effect on Quality-of-Life Questionnaire

	AFKS	
	r*	P
Atrial Fibrillation on Quality-of-Life Questionnaire	0.480†	< 0.0001
Symptoms	0.270†	< 0.0001
Daily activities	0.570†	< 0.0001
Treatment concern	0.413†	< 0.0001
Treatment satisfaction	0.470†	< 0.0001

*, Pearson Correlation Analysis was applied; †, Statistically significant; AFKS, Atrial Fibrillation Knowledge Scale.

was compared with the Atrial Fibrillation Effect on QualiTy-of-life Questionnaire (AFEQT).

The analysis revealed a positive and statistically significant correlation between the AFKS total score and the overall AFEQT score, as well as its sub-dimensions. A moderate positive correlation was found between the AFKS total score and the overall AFEQT score (r = 0.48, P < 0.001). The strongest relationship was observed in the daily activities sub-dimension (r = 0.570, P < 0.01), while the weakest was in the symptoms sub-dimension (r = 0.270, P < 0.01). Treatment concern showed a significant positive correlation (r = 0.413, P < 0.01), and treatment satisfaction also exhibited a significant positive correlation (r = 0.470, P < 0.01).

These findings support the high validity of the AFKS in Turkish patients with AF and demonstrate its strong correlation with patients' quality of life (Table 3).

Reliability

Scale Internal Consistency and Item Analysis

Table 4 presents the item analysis of the scale. The Cronbach's alpha reliability coefficient for the scale was 0.88, indicating a high degree of reliability. The item analysis results showed that item-total correlations for each item were high, and the Cronbach's alpha value changed minimally when individual items were deleted.

For example, when items 6 and 7 were removed, the Cronbach's alpha values were 0.883 and 0.882, respectively. These findings confirm the strong internal consistency of the scale and demonstrate that each item aligns well with the overall structure. Items 2 (importance of taking medication) and 1 (trigger factors) had the highest item-total correlations, indicating their significant contribution to the scale's overall reliability (Table 4).

Distinctiveness

The scale is expected to effectively distinguish between two extreme groups (i.e., the lower and upper 27% of scorers). A statistically significant difference between these groups indicates high discriminative power.[17]

The scale demonstrated a significant difference between the lower 27% group (n = 62; mean = 4.491 ± 1.020) and the upper 27% group (n = 62; mean = 8.667 ± 0.787). The independent samples t-test yielded a t-value of -24.47 and a p-value of < 0.0001, indicating a statistically significant difference between the two groups (P < 0.001).

In conclusion, significant differences were observed in all dimensions between the lower and upper 27% groups, supporting the scale's ability to effectively discriminate between individuals with low and high knowledge scores. This finding provides further evidence that the scale is a valid measurement tool (Table 5).

Test-Retest Reliability

As shown in Table 6, the test and retest mean scores for each sub-measure were highly correlated, with no statistically significant differences observed. For the AFKS total score, the test mean was 6.941 and the retest mean was 7.020. The t-test result yielded a t-value of -1.661 and a p-value of 0.103, indicating no significant difference between the two measurements.

Table 4. Item Descriptive Statistics and Cronbach's Alpha if Item Deleted for the Turkish Version of the Atrial Fibrillation Knowledge Scale

Item	Item-total correlation	Cronbach α if ıtem deleted
1. What are the trigger factors for atrial fibrillation?	0.735	0.869
2. Why is it important to take my medication for atrial fibrillation properly?	0.752	0.869
3. If atrial fibrillation is identified without the patient experiencing any complaints, the patient should immediately visit the hospital.	0.677	0.872
4. What is atrial fibrillation?	0.657	0.873
5. Why is oral anticoagulation medication prescribed in certain patients with atrial fibrillation?	0.730	0.869
6. Why should a person using anticoagulation medication be careful with the use of alcohol?	0.641	0.883
7. Atrial fibrillation is a rare condition.	0.625	0.882
8. It is particularly risky if a person does not feel his/her atrial fibrillation.	0.606	0.876
9. Which statement regarding physical exercise is true for patients with atrial fibrillation?	0.610	0.876
10. Which statement is true?	0.720	0.870
11. What is the purpose of regularly monitoring your blood values?	0.590	0.881

Table 5. Comparison of lower and upper 27% Groups on the Turkish Version of the Atrial Fibrillation Knowledge Scale

Groups	Lower 27% (n = 62)		Upper 27% (n = 62)		t[a]	SD	p
	$\bar{X}$	SD	$\bar{X}$	SD			
AFKS	4.491	1.020	8.667	0.787	-24.474	112	0.000

SD, Standard deviation; AFKS, Atrial Fibrillation Knowledge Scale; a, Independent Groups T-Test.

Table 6. Test-retest reliability of the Turkish Version of the Atrial Fibrillation Knowledge Scale

Measurement	Test (n = 51)		Retest (n = 51)		t	P[a]	ICC	P[b]
	$\bar{X}$	SD	$\bar{X}$	SD				
AFKS	6.941	1.714	7.020	1.726	-1.661	0.103	0.903	0.000

SD, Standard deviation; AFKS, Atrial Fibrillation Knowledge Scale; a, Dependent Group T-Test; b, Intraclass correlation coefficient (ICC).

The intraclass correlation coefficient (ICC) was 0.903 ($P < 0.001$), reflecting a high level of consistency between test and retest scores. These results indicate that the scale demonstrates strong temporal stability, with consistent measurements over time (Table 6).

Discussion

This study had two primary aims: first, to translate and culturally adapt the original Atrial Fibrillation Knowledge Scale (AFKS) from English to Turkish; second, to evaluate its psychometric properties in patients with atrial fibrillation (AF) in Türkiye. To ensure the accuracy and reliability of the translated scale items, it is essential to conduct a language validity assessment involving experts with language proficiency and professionals from various fields.[17,19,20] This approach helps minimize discrepancies and ensures that the translated items accurately and meaningfully reflect the original content.

In this study, the translation and back-translation method was employed, and content validity was assessed using the Davis technique. In scale adaptation and development studies, the number of consulted experts can vary between three and twenty.[32] To ensure content validity of the AFKS, both the item-content validity index (I-CVI) and the scale-content validity index (S-CVI) should exceed 0.80.[17,19,28,33] Based on the evaluations of five experts, values for the scale items ranged from 0.80 to 1.0. Following the pilot study, it was concluded that the scale demonstrated content validity and was culturally appropriate for use in Türkiye.

The CFA results confirmed the four-factor structure of the scale—atrial fibrillation in general, treatment, symptom recognition, and general attitudes—as originally developed by Hendriks et al.[15] These factors were validated in Turkish patients with AF. The confirmatory factor analysis showed that the model's fit indices were within acceptable limits, and the error values were below the recommended thresholds, indicating a robust model fit. Consequently, the results support the validity and compatibility of the model.

Unlike the original study, structured training was not provided to the participants in this study. However, the high education level and disease awareness among participants may have influenced the factor structure. In the Chinese version of the scale, items 9 and 10 loaded on a single factor, resulting in a three-factor structure. The authors attributed this difference to variations in the sample.[16]

In this study, factor loadings showed statistically significant relationships between items and their corresponding factors. For example, item 7 had a factor loading of 0.719 on Factor 1 (atrial fibrillation in general), and item 5 loaded 0.194 on Factor 2. Additionally, item 2 loaded 0.194 on Factor 3 (symptom recognition), and although this was a lower value, it was still statistically significant. In the original scale's four-factor structure, item 7 loaded on Factor 1 and item 5 on Factor 2.[15] In the Chinese version's three-factor structure, item loadings exceeded 0.30, which is considered acceptable and indicates that common factors strongly influence the item.[26]

To test the hypotheses proposed in earlier studies, this study examined construct validity by assessing the relationship between AFKS and AFEQT scores. Significant positive correlations were found between the total AFKS score and the total and subscale scores of the AFEQT (daily activities, symptoms, treatment concern, and treatment satisfaction). These findings support the criterion validity of the scale and indicate that higher AF knowledge is associated with better quality of life.

The original scale's developers also proposed evaluating whether knowledge and self-management reduce hospital visits by examining related variables, such as quality of life, anxiety, and depression. In the Chinese version, the hypothesis tested was that patients with an established AF diagnosis possess better knowledge than newly diagnosed patients.[16]

It is crucial for psychometric testing to be reproducible in new language contexts.[17-19] Internal consistency, typically evaluated using Cronbach's alpha, should approach 1.0. Values above 0.90 are considered acceptable for physiological measurements, and values above 0.70 are acceptable for attitude scales.[28,32] In this study, the Cronbach's alpha for the Turkish AFKS was 0.88, supporting the scale's reliability in measuring the intended construct. In comparison, the Cronbach's alpha values were 0.58 in the original version and 0.60 in the Chinese version.[16]

Our study also showed that the Turkish AFKS provides sensitive and valid measurements of distinctiveness. This parameter, recommended in adaptation guidelines, supports the scale's reliability by demonstrating significant score differences between low and high scorers.[21] The distinctiveness analysis further confirmed the scale's measurement validity. Notably, the Chinese version of the scale did not include distinctiveness testing.[16]

A test-retest procedure was conducted with 51 patients at a two-week interval, as recommended in psychometric guidelines.[32] The intraclass correlation coefficient (ICC), commonly used in quantitative research, reflects the proportion of variance not due to measurement error. ICC values below 0 indicate poor reliability, while values above 0.81 suggest almost perfect reliability.[32] High ICC values observed in this study indicate strong measurement consistency over time. Similar test-retest results were reported for the Chinese version.[16] In the original scale's recommendations, test-retesting was encouraged for future adaptation and psychometric studies.

Strengths and Limitations

A key strength of this study is its ability to assess the construct validity and internal consistency of the AFKS in Turkish using a sufficiently large sample size. Additionally, the mean total score of the scale was 6.94 ± 1.71, and participants' ages ranged from 20 to 82 years, indicating a wide range of knowledge levels among individuals. These findings underscore the variability in patients' understanding of atrial fibrillation and highlight the importance of individualized disease management.

A potential limitation of the study is that it was conducted in a university hospital located in an urban setting, using a sample of patients diagnosed with AF. Therefore, the findings may not be generalizable to the entire population of patients with AF in Türkiye.

Conclusion

The Turkish version of the AFKS is a straightforward and effective tool for assessing the knowledge levels of patients with atrial fibrillation. The results demonstrated that the Turkish version possesses satisfactory reliability and validity for use with Turkish AF patients. The scale's strong reliability coefficients, test-retest stability, and high criterion validity indicate that it can reliably measure knowledge in this patient group. These findings suggest that the scale is a tool that can be safely used by healthcare providers and researchers in Türkiye in clinical and educational settings for patients with AF.

Ethics Committee Approval: Ethics committee approval was obtained from Lokman Hekim University Scientific Research Ethics Committee (Approval Number: 2023/83, Date: 16.05.2023).

Informed Consent: The researcher obtained written informed consent from each participant after providing a detailed explanation of the study's purpose and procedures.

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References

1. Staerk L, Wang B, Preis SR, et al. Lifetime risk of atrial fibrillation according to optimal, borderline, or elevated levels of risk factors: cohort study based on longitudinal data from the Framingham Heart Study. *BMJ*. 2018;361:k1453. [CrossRef]
2. Benjamin EJ, Muntner P, Alonso A, et al.; American Heart Association Council on Epidemiology and Prevention Statistics Committee and Stroke Statistics Subcommittee. Heart Disease and Stroke Statistics-2019 Update: A Report from the American Heart Association. *Circulation*. 2019;139(10):e56-e528. Erratum in: *Circulation*. 2020;141(2):e33. [CrossRef]
3. Hindricks G, Potpara T, Dagres N, et al.; ESC Scientific Document Group. 2020 ESC Guidelines for the diagnosis and management of atrial fibrillation developed in collaboration with the European Association for Cardio-Thoracic Surgery (EACTS): The Task Force for the diagnosis and management of atrial fibrillation of the European Society of Cardiology (ESC) Developed with the special contribution of the European Heart Rhythm Association (EHRA) of the ESC. *Eur Heart J*. 2021;42(5):373-498. Erratum in: *Eur Heart J*. 2021;42(5):507. Erratum in: Eur Heart J. 2021;42(5):546-547. Erratum in: Eur Heart J. 2021;42(40):4194. [CrossRef]
4. Chung MK, Eckhardt LL, Chen LY, et al.; American Heart Association Electrocardiography and Arrhythmias Committee and Exercise, Cardiac Rehabilitation, and Secondary Prevention Committee of the Council on Clinical Cardiology; Council on Arteriosclerosis, Thrombosis and Vascular Biology; Council on Cardiovascular and Stroke Nursing; and Council on Lifestyle and Cardiometabolic Health. Lifestyle and Risk Factor Modification for Reduction of Atrial Fibrillation: A Scientific Statement from the American Heart Association. *Circulation*. 2020;141(16):e750-e772. [CrossRef]
5. Uyarel H, Onat A, Yüksel H, Can G, Ordu S, Dursunoğlu D. Incidence, prevalence, and mortality estimates for chronic atrial fibrillation in Turkish adults. *Turk Kardiyol Dern Ars*. 2008;36(4):214-222. Turkish.
6. Virani SS, Alonso A, Aparicio HJ, et al.; American Heart Association Council on Epidemiology and Prevention Statistics Committee and Stroke Statistics Subcommittee. Heart Disease and Stroke Statistics-2021 Update: A Report From the American Heart Association. *Circulation*. 2021;143(8):e254-e743. [CrossRef]
7. Streur M. Atrial Fibrillation Symptom Perception. *J Nurse Pract*. 2019;15(1):60-64. [CrossRef]
8. Hermans ANL, Pluymaekers NAHA, Lankveld TAR, et al. Clinical utility of rhythm control by electrical cardioversion to assess the association between self-reported symptoms and rhythm status in patients with persistent atrial fibrillation. *Int J Cardiol Heart Vasc*. 2021;36:100870. [CrossRef]
9. Tenbult N, Kraal J, Brouwers R, Spee R, Eijsbouts S, Kemps H. Adherence to a Multidisciplinary Lifestyle Program for Patients with Atrial Fibrillation and Obesity: Feasibility Study. *JMIR Form Res*. 2022;6(4):e32625. [CrossRef]
10. Alonso-Coello P, Montori VM, Díaz MG, et al. Values and preferences for oral antithrombotic therapy in patients with atrial fibrillation: physician and patient perspectives. *Health Expect*. 2015;18(6):2318-2327. [CrossRef]
11. Siegal DM, Verbrugge FH, Martin AC, et al. Country and health expenditure are major predictors of withholding anticoagulation in atrial fibrillation patients at high risk of stroke. *Open Heart*. 2023;10(2):e002506. [CrossRef]
12. Chen G, Li G, Zhang D, Wang X, Guo X. Blanking period antiarrhythmic drugs after catheter ablation for atrial fibrillation: a meta-analysis of randomized controlled trials. *Front Cardiovasc Med*. 2023;10:1071950. [CrossRef]
13. Mulholland RJ, Manca F, Ciminata G, et al. Evaluating the effect of inequalities in oral anti-coagulant prescribing on outcomes in people with atrial fibrillation. *Eur Heart J Open*. 2024;4(2):oeae016. [CrossRef]

14. Salmasi S, Kwan L, MacGillivray J, et al. Assessment of atrial fibrillation patients' education needs from patient and clinician perspectives: A qualitative descriptive study. *Thromb Res*. 2019;173:109-116. [CrossRef]
15. Hendriks JM, Crijns HJ, Tieleman RG, Vrijhoef HJ. The atrial fibrillation knowledge scale: development, validation and results. *Int J Cardiol*. 2013;168(2):1422-1428. [CrossRef]
16. Li PWC, Yu DSF, Yan BP, Hendriks JM, Wong CWY, Chan BS. Psychometric Validation of the Chinese Version of the Atrial Fibrillation Knowledge Scale in Chinese Patients With Atrial Fibrillation. *J Cardiovasc Nurs*. 2023;38(1):92-100. [CrossRef]
17. International Test Commission. ITC guidelines for translating and adapting tests (Second edition). *Int J Test*. 2017;18(2):101-134. [CrossRef]
18. Terwee CB, Prinsen CAC, Chiarotto A, et al. COSMIN methodology for evaluating the content validity of patient-reported outcome measures: a Delphi study. *Qual Life Res*. 2018;27(5):1159-1170. [CrossRef]
19. Mokkink LB, Boers M, van der Vleuten CPM, et al. COSMIN Risk of Bias tool to assess the quality of studies on reliability or measurement error of outcome measurement instruments: a Delphi study. *BMC Med Res Methodol*. 2020;20(1):293. [CrossRef]
20. Bowden A, Fox-Rushby JA. A systematic and critical review of the process of translation and adaptation of generic health-related quality of life measures in Africa, Asia, Eastern Europe, the Middle East, South America. *Soc Sci Med*. 2003;57(7):1289-1306. [CrossRef]
21. Beaton DE, Bombardier C, Guillemin F, Ferraz MB. Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine (Phila Pa 1976)*. 2000;25(24):3186-3191. [CrossRef]
22. Kashani RG, Sareh S, Genovese B, et al. Predicting postoperative atrial fibrillation using CHA2DS2-VASc scores. *J Surg Res*. 2015;198(2):267-272. [CrossRef]
23. Uysal D, Aksoy F, Ibrişim E. The Validation of the ATRIA and CHA2DS2-Vasc Scores in Predicting Atrial Fibrillation after Coronary Artery Bypass Surgery. *Braz J Cardiovasc Surg*. 2020;35(5):619-625. [CrossRef]
24. Güneş F, Boyraz S. Effect of atrial fibrillation on quality of life (AFEQT) questionnaire: A Turkish validity and reliability study. *Turk Kardiyol Dern Ars*. 2021;49(3):223-232. [CrossRef]
25. Spertus J, Dorian P, Bubien R, et al. Development and validation of the Atrial Fibrillation Effect on QualiTy-of-Life (AFEQT) Questionnaire in patients with atrial fibrillation. *Circ Arrhythm Electrophysiol*. 2011;4(1):15-25. [CrossRef]
26. Tabachnick BG, Fidell LS, Ullman JB. *Using multivariate statistic*. 6th ed. Boston: Pearson; 2013.
27. George D, Mallery P. SPSS for Windows step by step: A simple guide and reference. 17.0 update. 10th ed. Pearson; 2010.
28. Davis LL. Instrument review: Getting the most from a panel of experts. *Appl Nurs Res*. 1992;5(4):194-197. [CrossRef]
29. Brown TA. *Confirmatory factor analysis for applied research*. 2nd ed. New York: The Guilford Press; 2015.
30. Hair JF Jr, Babin BJ, Krey N. Covariance-based structural equation modeling in the Journal of Advertising: review and recommendations. *J Advertis*. 2017;46(1):163-177. [CrossRef]
31. Feldt LS, Qualls AL. Bias in coefficient alpha arising from heterogeneity of test content. *Appl Meas Educ*. 1996;9(3):277-286. [CrossRef]
32. Landis JR, Koch GG. The measurement of observer agreement for categorical data. *Biometrics*. 1977;33(1):159-174. [CrossRef]
33. Polit DF, Beck CT. The content validity index: are you sure you know what's being reported? Critique and recommendations. *Res Nurs Health*. 2006;29(5):489-497. [CrossRef]

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Kalp Yetersizliği Hastalarında Yoganın Yaşam Kalitesine Etkisi: Randomize Kontrollü Çalışmaların Sistematik Derlemesi

The Effect of Yoga on Quality of Life in Heart Failure Patients: A Systematic Review of Randomized Controlled Trials

ÖZET

Amaç: Bu sistematik derleme, yoganın kalp yetersizliği hastalarında yaşam kalitesine etkisini belirlemek amacıyla yapıldı.

Yöntem: Sistematik derleme protokolünün oluşturulması ve makalenin yazımı PRISMA-P (Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols) kriterleri esas alınarak hazırlandı. Bu sistematik derlemede, literatür taraması yıl sınırlaması olmaksızın "PubMed, Scopus, Web of Science, Cochrane Library" veri tabanlarında yapıldı. Derlemeye dahil etme ve dışlama kriterleri PICOS yöntemine göre belirlenen çalışmalar dahil edildi. Ulaşılan tüm araştırmalar, dahil edilme kriterleri yönünden incelenmiş olup elde edilen veriler bağımsız iki araştırmacı tarafından yorumlandı. Derleme kapsamına alınan araştırmaların kalite değerlendirmesi iki bağımsız araştırmacı tarafından Joanna Briggs Enstitüsü tarafından randomize kontrollü araştırmalar için oluşturulmuş kontrol listesine göre değerlendirildi.

Bulgular: Bu sistematik derlemeye toplam 251 katılımcının yer aldığı beş randomize kontrollü çalışma dahil edildi. Derleme kapsamına alınan çalışmaların büyük çoğunluğunda yoganın kalp yetersizliği hastalarında yaşam kalitesini artırdığı belirlendi. Çalışmaların tamamında hatha yoganın uygulandığı saptandı. Dahil edilen çalışmalarda yoga uygulama sıklığı haftada 2-7 gün, uygulama süresi 8-12 hafta boyunca seans başına 60-70 dakika arasında değiştiği belirlendi.

Sonuç: İncelenen çalışmalarda kalp yetersizliği olan hastalarda yoganın yaşam kalitesi üzerinde olumlu bir etkiye sahip olduğu görüldü. Bununla birlikte mevcut çalışmaların metodolojik sınırlamaları göz önüne alındığında bulguları desteklemek için daha büyük örneklem gruplarıyla yüksek kaliteli çalışmalara ihtiyaç vardır.

Anahtar Kelimeler: Kalp yetersizliği, sistematik derleme, yaşam kalitesi, yoga

ABSTRACT

Objective: This systematic review was conducted to determine the effects of yoga on quality of life in heart failure patients.

Method: The systematic review protocol and writing of the article were prepared based on PRISMA-P (Preferred Reporting Items for Systematic review and Meta-Analysis Protocols) criteria. In this systematic review, the literature search was conducted in the "PubMed, Scopus, Web of Science, Cochrane Library" databases without any year limitation. Studies whose inclusion and exclusion criteria were determined according to the PICOS method were included in the review. All studies reached were examined in terms of inclusion criteria and the obtained data were interpreted by two independent researchers. The quality of the studies included in the review was assessed by two independent researchers according to the checklist for randomised controlled trials developed by the Joanna Briggs Institute.

Results: Five randomized controlled trials with a total of 251 participants were included in this systematic review. In the majority of the studies included in the review, it was determined that yoga improves the quality of life in heart failure patients. It was determined that hatha yoga was applied in all of the studies. In the included studies, the frequency of yoga practice was determined to vary between 2-7 days per week and the duration of practice was determined to vary between 60-70 minutes per session for 8-12 weeks.

Conclusion: In the studies examined, it was seen that yoga had a positive effect on the quality of life in patients with heart failure. However, given the methodological limitations of existing studies, high-quality studies with larger sample groups are needed to support the findings.

Keywords: Heart failure, systematic review, quality of life, yoga

KLİNİK ÇALIŞMA
ORIGINAL ARTICLE

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Giriş

Kalp yetersizliği, dünyada ve ülkemizde mortalite ve morbidite açısından yüksek oranlara sahip olması nedeniyle önemli bir sağlık sorunu olarak görülmektedir.[1] Dünya genelinde 64 milyondan fazla insanı etkileyen kalp yetersizliği prevalansı, yaşlanan popülasyon ve tedavideki gelişmeler nedeniyle artmaya devam etmektedir.[2]

Kalp yetersizliğinde nefes darlığı, halsizlik, yorgunluk, ödem, uykusuzluk ve depresyon gibi semptomlar yaygın olarak görülmektedir.[3-5] Kalp yetersizliğine bağlı olarak görülen bu yıkıcı semptomlar fonksiyonel kapasitede azalma ve günlük yaşam aktivitelerini yerine getirmede sınırlılığa neden olmaktadır.[6,7] Aynı zamanda bu durum başta fiziksel, mental ve sosyal alanlar olmak üzere yaşam kalitesinin birçok boyutunun olumsuz etkilenmesine yol açmaktadır.[8,9] Literatürde kalp yetersizliği hastalarının yaşam kalitesinin düşük olduğu ve bu durumun yaş, cinsiyet, hastalık süresi, kullanılan ilaç sayısı, ejeksiyon fraksiyonu gibi birçok faktörden olumsuz etkilendiği bildirilmektedir.[10,11] Ayrıca kalp yetersizliği hastalarında olumsuz etkilenen yaşam kalitesi hastaneye başvuru sıklığını artırmakta ve mortalite oranlarını da yükseltmektedir.[12] Bu nedenle kalp yetersizliği hastalarının tedavi ve tedavi sonrası süreçte semptomlarının azaltılması ve yaşam kalitelerinin iyileştirilmesi gerektiğine dikkat çekilmektedir.[4]

Kalp yetersizliğinin semptom kontrolü ve yönetiminde farmakolojik tedavi kadar nonfarmakolojik tedavide önemli bir yer tutmaktadır.[4] Tamamlayıcı ve bütünleşik tedavi kullanımının kalp yetersizliği hastalarında kullanımı gittikçe artış göstermektedir.[13] Tamamlayıcı ve bütünleşik tedavi yöntemleri arasında yer alan yoga invaziv olmayan, ekonomik, güvenli ve etkili bir yöntemdir. Temelleri Hindistan'a dayanan yoganın sağlığı koruyucu ve geliştirici yönü ile sağlıklı bireylere, iyileştirici yönüyle de hastalara uygulanabilir bir yöntem olduğu bildirilmektedir.[14] Yoga, zihin ve beden beraberliğine dayalı duruş pozları (asanalar), meditasyon (dhyana) ve solunum egzersizlerinin (pranayama) bir arada kullanıldığı kapsamlı bir uygulama olarak tanımlanmaktadır.[15] Asanalar; esneme, dengeye yönelik yapılan fiziksel duruşların devamlılığı ile karakterize, egzersiz ve gücü geliştirmeyi amaçlamaktadır. Pranayamalar, nefes kontrolüyle vücut farkındalığına odaklanan egzersizlerden oluşmaktadır. Meditasyon ise düşüncelere istemli bir şekilde konsantre olarak algı, dikkat, kavrama gücünde değişiklik yaratmayı amaçlayan mental bir süreçtir. Holistik bir yaklaşım olan yoga, etik, duygusal, zihinsel ve ruhsal öğretilerin tümünü kapsamaktadır.[16] Literatürde farklı örneklem gruplarında ve farklı semptomların kontrolünde yoganın etkinliği incelenmiş ve kronik böbrek yetersizliği, inme, kanser ve tip 2 diyabet gibi kronik hastalıklarda iyileşmelere neden olduğu belirlenmiştir. Yine aynı çalışmalarda yoganın glisemik kontrol, kan basıncı, yorgunluk, depresyon ve stres gibi semptomlar üzerinde etkili olduğu ve sonuçlardaki değişimin olumlu yönde olduğu vurgulanmaktadır.[17-21] Yoganın semptom giderme, gevşeme, rahatlama, huzur, olumlu düşünme, iyileştirme gibi gereksinimleri karşıladığından özellikle son yıllarda giderek daha fazla kullanılmaya başlandığı belirtilmektedir.[22]

Literatürde kalp yetersizliği hastalarında yoganın etkinliğinin incelendiği bir meta-analiz çalışması bulunmaktadır.[23] Gomes-Neto ve arkadaşları[23] tarafından yürütülen bu meta-analiz çalışmasında yoganın kalp yetersizliği hastalarında egzersiz kapasitesini ve yaşam kalitesini artırdığı belirlenmiştir. Ancak söz konusu meta-analizin sınırlılıklarında, dahil edilen çalışmaların örneklem sayısının az olduğu ve sadece iki randomize kontrollü çalışmanın dahil edildiği yazarlar tarafından vurgulanmıştır. Gomes-Neto ve arkadaşlarının[23] 2014 yılında yayımladıkları meta-analizden sonra mevcut sistematik incelemenin yapıldığı tarihe kadar, daha fazla sayıda randomize kontrollü çalışma yayımlanmıştır. Buradan hareketle bu çalışmada, kalp yetersizliği hastalarında yoganın yaşam kalitesi üzerine etkisini inceleyen metodolojik kalitesi yüksek ve güncel çalışmaların sistematik olarak değerlendirilmesi ve elde edilen verilerin incelenerek literatüre bilgi kazandırılması amaçlandı. Bu sistematik derlemenin kalp yetersizliği hastalarında yoga müdahalesi ile ilgili planlanacak çalışmalarda, sağlık profesyonellerine ve araştırmacılara yeni bir perspektif kazandırabilmesi ve rehberlik etmesi açısından yararlı olacağı düşünülmektedir.

ANA NOKTALAR

- Yoga, kalp yetersizliği hastalarında yaşam kalitesini olumlu yönde etkilemektedir.
- Metodolojik sınırlılıklar nedeniyle elde edilen bulgular dikkatle yorumlanmalıdır.
- Gelecekteki araştırmalar kalp yetersizliği hastalarında farklı yoga bileşenlerinin etkinliğinin karşılaştırılmasına odaklanılmalıdır.

Amaç

Bu sistematik derlemenin amacı, kalp yetersizliği olan hastalarda yoganın yaşam kalitesine etkisini incelemektir.

Araştırma Sorusu

1. Yoganın kalp yetersizliği hastalarında yaşam kalitesi üzerine etkililiği nedir?
2. Kalp yetersizliği hastalarına uygulanan yoga, yaşam kalitesine etkisini belirlemede hangi sıklık ve sürede uygulanmıştır?

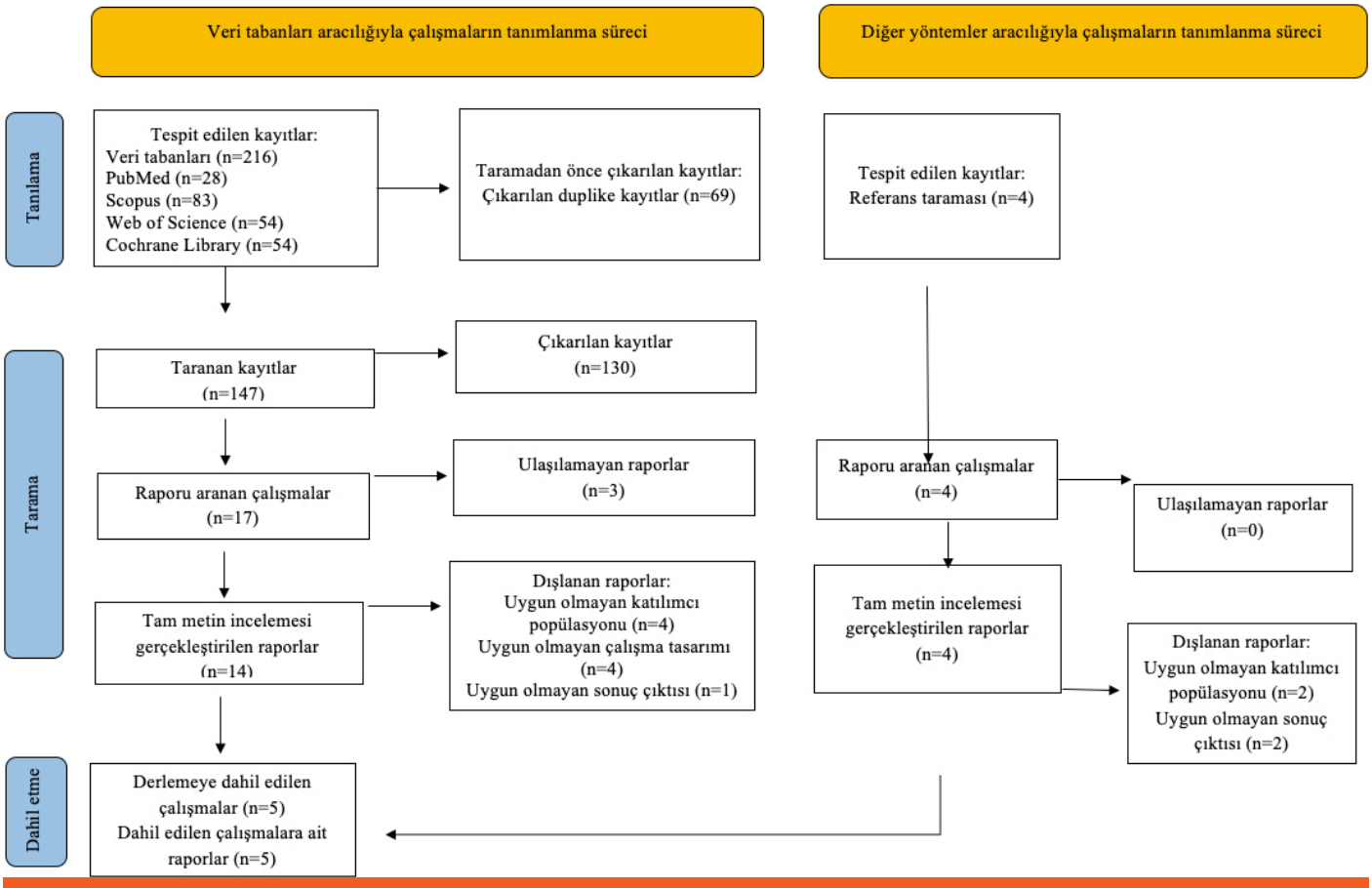
Yöntemler

Araştırmanın Türü

Bu çalışma sistematik derleme olarak tasarlandı. Sistematik derleme protokolünün oluşturulması ve makalenin yazımı PRISMA-P (Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols) kriterleri esas alınarak hazırlandı.[24]

Literatür Tarama ve Tarama Stratejisi

Bu sistematik derlemede, literatür taraması yıl sınırlaması olmaksızın Scopus, Web of Science, PubMed ve Cochrane Library veri tabanlarında yapıldı. Tarama MeSH (Medical Subjects Headings) terimleri ile belirlenen ingilizce anahtar kelimeler doğrultusunda gerçekleştirildi. Tarama "heart failure", "yoga" ve "life of quality" kelime ve kelime gruplarının kombinasyonları kullanılarak 12-15 Ağustos 2024 tarihleri arasında yapıldı. Ayrıca konuya ilişkin sistematik incelemelerin referans listeleri gözden geçirildi. Taramalar iki araştırmacı (AA, MYB) tarafından bağımsız olarak gerçekleştirildi. Toplam 216 çalışmadan sistematik derlemeye dahil edilen beş çalışmaya ulaşma sürecini gösteren çalışmaların sayısı veri tabanlarına göre kategorize edilerek PRISMA akış diyagramında gösterildi (Şekil 1).



Şekil 1. Akış diyagramı.

Tablo 1. Çalışmaların dahil etme ve dışlama kriterleri

	Dahil Etme Kriterleri	Dışlama Kriterleri
P (Patient/Katılımcı)	18 yaş ve üzeri kalp yetersizliği olan hastalar	18 yaş altı hastalar
I (Intervention/Müdahale)	Kalp yetersizliği hastalarında yoga uygulanan çalışmalar	–
C (Comparison/Karşılaştırma)	Rutin bakım ya da farklı bir girişimin uygulandığı çalışmalar	–
O (Outcome/Sonuç)	Yoga uygulaması sonrası yaşam kalitesi ile ilgili sonucun değerlendirildiği çalışmalar	Yoganın yaşam kalitesi üzerine etkisinin değerlendirilmediği çalışmalar
S (Study design/Çalışma deseni)	Tam metnine ulaşılan İngilizce dilinde randomize kontrollü çalışmalar	İngilizce dilinde olmayan, tanımlayıcı çalışma, nitel çalışma, editöre mektup, olgu sunumu, sistematik ve geleneksel derleme, sadece özetine ulaşılan çalışmalar

Dahil Edilme ve Dışlanma Kriterleri

Bu sistematik derlemede yer alan çalışmaların seçimi PICOS (P = Population, I = Implementation, C = Comparison grup, O = Outcome, S = Study design) yöntemiyle oluşturulan dahil etme kriterlerine göre belirlendi (Tablo 1).

Verilerin Ayrılması ve Analizi

Çalışmaların önce başlık ve özetleri okunup değerlendirildi, daha sonra tam metnine ulaşılan makaleler ayrıntılı olarak incelendi. Verilerin özetlenmesi için yazarlar tarafından standart bir veri çıkarım formu geliştirildi ve veriler bu doğrultuda değerlendirildi. Veri çıkarım formu ile sistematik derlemeye dahil edilen çalışmaların yazarları, yılı, yapıldığı yer, tasarımı, örneklem büyüklüğü, cinsiyet, yoga müdahalesinin özellikleri ve ölçüm aracı hakkındaki verilerin toplanması sağlandı. Veri çıkarım aşamasında araştırmacılar, çalışmaları bağımsız olarak veri çıkarım formuna aktarıp daha sonra birlikte kontrol etti. Araştırmacılar arasında görüş farklılığı yaşandığı durumda literatür bilgisi rehberliğinde uzlaşma sağlandı

Metodolojik Kalitenin Değerlendirilmesi

Randomize kontrollü beş çalışmanın kalite değerlendirmesi, iki yazar tarafından bağımsız olarak Joanna Briggs Enstitüsü (Joanna Briggs Institute-JBI) tarafından randomize kontrollü deneysel

Tablo 2. Çalışmaların metodolojik kalite değerlendirmeleri

	Pullen (2008)[26]	Pullen (2010)[27]	Hägglund (2017)[28]	Jain (2022)[29]	Krishna (2014)[30]
1- Katılımcıların tedavi gruplarına atanması için gerçek randomizasyon kullanıldı mı?	E	E	E	E	E
2- Tedavi gruplarına dağılım gizli miydi?	B	B	E	E	B
3- Tedavi grupları başlangıçta benzer miydi?	E	E	E	E	E
4- Katılımcılar tedavi atamasına kör müydü?	B	B	H	H	B
5- Tedaviyi uygulayanlar tedavi atamasına kör müydü?	B	B	H	H	H
6- Tedavi grupları, ilgili müdahale dışında aynı şekilde mi muamele gördü?	E	E	E	E	E
7- Sonuç değerlendiricileri tedavi atamasına kör müydü?	E	E	H	H	H
8- Sonuçlar tedavi grupları için aynı şekilde ölçüldü mü?	E	E	E	E	E
9- Sonuçlar güvenilir bir şekilde ölçüldü mü?	E	E	E	E	E
10- Takip tamamlandı mı ve tamamlanmadıysa, takipleri açısından gruplar arasındaki farklılıklar yeterince tanımlandı ve analiz edildi mi?	E	E	E	E	E
11- Katılımcılar randomize edildikleri gruplarda mı analiz edildi?	E	E	E	E	E
12- Uygun istatistiksel analiz kullanıldı mı?	E	E	E	E	E
13- Deneme tasarımı uygun muydu ve standart randomize kontrollü çalışma tasarımından sapmalar (bireysel randomizasyon, paralel gruplar) denemenin yürütülmesinde ve analizinde hesaba katıldı mı?	E	E	E	E	E
Toplam skor	10	10	10	10	9

E, Evet; H, Hayır; B, Belirsiz.

çalışmalar için oluşturulan kalite değerlendirme kontrol listesi ile değerlendirildi.[25] JBI Randomize Kontrollü Deneysel Çalışmalar için kontrol listesi dört ayrı kategori altında değerlendirilen toplam 13 sorudan oluşmaktadır. İlk üç soru "Seçim ve tahsisle ilgili yanlılık" riskini, sonraki üç soru "Müdahalenin/maruziyetin uygulanmasıyla ilgili yanlılık" riskini, sonraki üç soru "Sonucun değerlendirilmesi, tespiti ve ölçümü ile ilgili yanlılık" riskini, son dört soru ise "Katılımcının elde tutulması ile ilgili yanlılık" riskini sorgulamaktadır. Kontrol listesinde her madde "evet, hayır, belirsiz ve uygulanamaz" olarak değerlendirilmektedir. Kalite puanı hesaplaması iki yazar (AA, MYB) tarafından yapıldı ve her makale için kalite puanlarının ortalaması alınarak yazıldı (Tablo 2, Tablo 3).

Araştırmanın Etik Yönü

Sistematik derlemeye dahil edilen çalışmaların incelenmesi için etik kurul izni alınmasına gereksinim duyulmadı. Araştırmaya alınan tüm makalelere uygun şekilde atıf yapıldı.

Bulgular

Araştırmaların Seçimi

Bu sistematik derlemede veri tabanlarının taranması sonucunda toplam 216 çalışmaya ulaşıldı. Bu çalışmaların 69 tanesi duplikasyon nedeniyle elendi. Başlık ve özet incelemesi sonucu 130 çalışma elendi. Tam metin incelemesine alınan 14 çalışmanın dokuz tanesi dahil etme ve dışlama kriterlerine uygun olmadığı için dışlandı. Bu aşamadan sonra, sistematik derlemeye dahil edilen 5 çalışmanın alıntı araması sürecine geçildi. Bu doğrultuda çalışmaların referans listeleri tarandı ve beş çalışmanın tam metni araştırma uygunluğu kapsamında incelendi. Bu kayıtlardan bir tanesi çalışmanın dahil etme kriterlerine uygunluk gösterdi. Beş randomize kontrollü çalışmanın kalp yetersizliği hastalarında yoganın yaşam kalitesine etkisini belirlemek için yapılan çalışmalar olduğu saptandı. Çalışmaların seçim sürecini gösteren PRISMA akış diyagramı Şekil 1'de verildi.

Dahil Edilen Çalışmaların ve Katılımcılarının Özellikleri

Sistematik derlemede örneklem büyüklüğü 19-92 arasında değişen ve toplam 251 katılımcının yer aldığı beş çalışma incelemeye uygun bulundu. Bu çalışmaların örneklem grubunu kalp yetersizliği hastaları oluşturmaktadır. Bir çalışmada kadın katılımcı oranı daha yüksek olmakla birlikte[26] çalışmaların büyük çoğunluğunda erkek cinsiyetin daha baskın olduğu görülmektedir.[27-30] Analize dahil edilen çalışmaların iki tanesi 2010 yılı ve öncesinde yayımlanmış olup[26,27] üç tanesi 2014 yılı ve sonrasında yayımlanmıştır.[28-30] Çalışmalar Amerika Birleşik Devletleri (2),[26,27] Hindistan (2)[29,30] ve İsveç (1)'te[28] olmak üzere üç farklı ülkede yürütülmüştür. İncelenen çalışmaların üç tanesinde New York Kalp Birliği (NYHA) I-II-III,[26-28] iki tanesinde NYHA I-II29,[30] sınıfında yer alan hastalar dahil edilmiştir. İncelemeye alınan çalışmaların dört tanesinde yaşam kalitesi Minnesota Kalp Yetmezliği ile Yaşam Anketi ile ölçülürken[26,27,29,30] bir tanesinde EQ-5D yaşam kalitesi ölçeği ve Kansas City Kardiyomiyopati Anketi'nin kullanıldığı görülmüştür.[28] Sistematik derlemeye alınan araştırmaların tamamı randomize kontrollü çalışma niteliğindedir (Tablo 3).[26-30]

Yoga Programının Özellikleri

Sistematik derlemeye dahil edilen çalışmaların tamamında müdahaleler yoga eğitmenleri tarafından uygulanmıştır.[26-30] İncelemeye alınan çalışmaların tamamında yoga hastane ve ev ortamında gerçekleştirilmiştir. Derlemeye dahil edilen çalışmaların dört tanesinde yoga süresinin 60 dakika,[27-30] bir çalışmada ise 70 dakika sürdüğü belirlenmiştir.[26] Yoganın uygulama sıklığı değerlendirildiğinde üç çalışmada haftada iki gün,[26-28] bir çalışmada haftada üç gün,[30] bir çalışmada ise her gün uygulandığı

Tablo 3. Kalp yetersizliği hastalarına uygulanan yoganın yaşam kalitesi üzerine etkisini inceleyen çalışmaların özellikleri

İlk yazar, yayın yılı, ülke	Çalışma deseni	Örneklem sayısı (M + K)	Yaş, yıl ($\bar{X}$ ± SS)		Kadın/ Erkek	NYHA sınıfı	EF ($\bar{X}$ ± SS)		Ölçüm aracı	Ana bulgular	Kalite puanı
			M	K			M	K			
Hägglund,[28] 2017 İsveç	Prospektif randomize kontrollü pilot çalışma	40 (20 + 20)	64,1 ± 9,4	65,7 ± 8,5	14/26	I-II-III	–	–	EQ-5D KCCQ	Yoga müdahalesi, KY hastalarında KCCQ alt boyutlarından semptom sıklığı (P = 0,03), öz yeterlilik (P = 0,01), klinik özet skoru (P = 0,05) ve genel özet skoru (P = 0,04) alanlarında anlamlı düzeyde iyileşme sağlamıştır. Yoga grubundaki bireylerde, EQ-5D ölçeğinin bir bileşeni olan EQ-VAS skorlarında anlamlı düzeyde bir iyileşme gözlemlenmiştir (P = 0,004).	10
Jain,[29] 2022 Hindistan	RKÇ	60 (30 + 30)	51,9 ± 6,86	52,3 ± 6,58	15/45	I-II	33,37 ± 2,76	33,33 ± 2,54	MKYYA	Yoganın KY hastalarında yaşam kalitesini önemli ölçüde (P < 0,001) iyileştirdiği saptanmıştır.	10
Krishna,[30] 2014 Hindistan	RKÇ	92 (44 + 48)	49,3 ± 5,70	50,1 ± 4,54	28/64	I-II	%30-50	%30-50	MKYYA	12 haftalık yoga müdahalesinin KY hastalarında yaşam kalitesini artırdığı (P < 0,001), duygusal (P < 0,001) ve fiziksel (P < 0,001) alt boyutlarında önemli iyileşmeler sağladığı tespit edilmiştir.	9
Pullen,[26] 2008 Amerika Birleşik Devletleri	RKÇ	19 (9 + 10)	52,1 ± 3,3	50,5 ± 12,8	10/9	I-II-III	28 (6,9)	23 (12,9)	MKYYA	Yoga müdahalesi sonrası girişim grubunun yaşam kalitesi toplam puanında, fiziksel ve emosyonel alt boyutlarında iyileşme görüldüğü ancak bu durumun istatistiksel olarak anlamlı olmadığı saptanmıştır (P > 0,05).	10
Pullen,[27] 2010 Amerika Birleşik Devletleri	RKÇ	40 (21 + 19)	55,8 ± 7,6	52,5 ± 12,7	17/23	I-II-III	31,2 (10)	27,9 (14)	MKYYA	Yoga grubunda MKYYA toplam puanında (P = 0,02) ve fiziksel alt boyutunda (P < 0,001) önemli iyileşmeler olduğu, emosyonel alt boyutunda iyileşme olduğu ancak bu durumun istatistiksel olarak anlamlı olmadığı (P > 0,05) belirlenmiştir.	10

SS, Standart sapma; M, Müdahale grubu; K: Kontrol grubu; KY, Kalp yetersizliği; MKYYA, Minnesota kalp yetersizliği ile yaşam anketi; NYHA, New York Kalp Birliği; EF, Ejeksiyon fraksiyonu; RKÇ, Randomize kontrollü çalışma; EQ-5D, Euroqol 5 dimension; KCCQ, Kansas City Kardiyomiyopati Anketi.

görülmektedir.[29] İncelenen çalışmalarda hastalar 8-12 hafta arasında takip edilmiştir.[26-30] Dahil edilen çalışmalarda toplam yoga seansının 16-84 arasında değiştiği saptanmıştır (Tablo 4).[26-30] Sistematik derlemeye dahil edilen çalışmalarda yoga programlarının temel bileşenlerinin ısınma, asanalar/duruşlar, nefes egzersizleri/pranayama, meditasyon ve gevşeme olduğu gösterilmiştir. Çalışmaların büyük çoğunluğunda ısınma aşamasının 5-10 dakika,[26-29] asanaların 30-40 dakika[26-29] ve gevşeme ve meditasyon süresinin 10-20 dakika sürdüğü belirlenmiştir.[26-29] Bir çalışmada ise bu bileşenlerin süresi hakkında bilgi verilmemiştir.[30]

Olumsuz Olaylar

Dahil edilen üç çalışmada yoga seansı sırasında ya da yoga seansları ile ilişkili olarak herhangi bir olumsuz durumun gelişmediği bildirilmiştir. Söz konusu çalışmalarda olumsuz olaylar; yoga seansları sırasında oluşan nefes darlığı, baş dönmesi, ortopedik yaralanmalar ve aritmiler gibi durumları içermektedir. İki çalışmada ise herhangi bir olumsuz olayın gelişip gelişmediğine yönelik bilgi verilmemiştir (Tablo 4).

Yoganın Yaşam Kalitesine Etkisi

İncelemeye alınan beş çalışmanın dördünde yoganın yaşam kalitesini olumlu yönde etkilediği belirlenirken, bir tanesinde yaşam kalitesinin iyileştiği ancak bu durumun istatistiksel olarak anlamlı olmadığı saptanmıştır (Tablo 3).

Tartışma

Bu sistematik derleme, kalp yetersizliği hastalarında yoganın yaşam kalitesine etkisinin belirlenmesi amacı ile gerçekleştirilmiştir. Bu doğrultuda, kapsamlı bir literatür taraması yapılmış, dahil etme kriterlerini karşılayan beş randomize kontrollü çalışma sistematik derlemeye dahil edilmiştir. Sistematik derlemeye dahil edilen çalışmalar incelendiğinde yoganın kalp yetersizliği hastalarında yaşam kalitesini olumlu yönde etkilediği görülmüştür. Bu araştırmada yoga uygulamasına ilişkin temel bilgiler sunulmuş olup, bu durum gelecekte yapılacak çalışmalarda yoga protokolünün oluşturulmasına ve yoganın kalp yetersizliği hastalarına nasıl aktarılabileceği konusunda yol gösterici olabilir. Ancak sistematik derleme kapsamına alınan çalışmalar farklı örneklem büyüklüğünde, farklı NYHA tipinde ve farklı ejeksiyon fraksiyonu düzeyine sahip hastaları kapsamaktadır. Ayrıca yoga uygulama sıklığı ve süreleri çalışmalara göre farklılık göstermektedir. Bu durum araştırma kapsamında incelenen çalışmaların örneklemlerinin heterojen olmasına neden olmuştur. Bu nedenle çalışmanın sonuçları dikkatli yorumlanmalıdır.

Sistematik derlemeye dahil edilen çalışmaların büyük çoğunluğunda kalp yetersizliği hastalarında yoganın yaşam kalitesini olumlu yönde etkilediği belirlenmiştir. Bu bulgu kalp yetersizliği hastalarında yoganın etkisinin incelendiği ve iki çalışmanın dahil edildiği meta-analiz sonucuyla uyumludur.[23] Literatürde kronik hastalığı olan bireylerde de yoganın yaşam kalitesini yükselttiğini bildiren çalışmalar bulunmaktadır.[31,32] Yoganın yaşam kalitesi üzerindeki etkisi gevşeme esnasında sempatik sinir sistemi aktivitelerinde azalma, parasempatik sinir sistemi aktivitelerinde ise artış gerçekleşmesiyle açıklanabilir.[33] Krishna ve arkadaşları[34] tarafından yürütülen bir çalışmada kalp yetersizliği hastalarında 12 haftalık bir yoga müdahalesinin parasempatik aktiviteyi önemli ölçüde iyileştirdiği, sempatik

Tablo 4. Kalp yetersizliği hastalarına uygulanan yoga programının özellikleri

İlk yazar, yayın yılı	Yoga uygulayıcısı	Mekan	Yoga bileşeni	Süre (dakika)	Seans	Toplam süre (hafta)	Toplam seans	Olumsuz etki
Hägglund,[28] 2017	Sertifikalı eğitmen	Hastane + Ev	10 dakika ısınma aşaması 40 dakika duruş 10 dakika meditasyon gevşeme (oturur pozisyonda)	60	Haftada 2	12	24	Belirsiz
Jain,[29] 2022	Eğitimli yoga eğitmeni	Hastane + Ev	10 dakika odaklanma 30 dakika asana 20 dakika pranayama, meditasyon ve gevşeme	60	Her gün	12	84	Olumsuz bir durum yaşanmamış
Krishna,[30] 2014	Kardiyak rehabilitasyon konusunda uzman yoga terapisti	Hastane + Ev	Asana Pranayama meditasyon gevşeme	60	Haftada 3	12	36	Belirsiz
Pullen,[26] 2008	Sertifikalı yoga eğitmeni	Hastane + Ev	10 dakika ısınma aşaması, 40 dakika ayakta veya oturarak yoga duruşları (asanalar) Nefes egzersizlerini (pranayama) içeren 20 dakikalık gevşeme aşaması ve meditasyon	70	Haftada 2	8	16	Olumsuz durum yaşanmamış
Pullen,[27] 2010	Sertifikalı yoga eğitmeni	Hastane + Ev	Nefes egzersizlerini (pranayama) içeren 5 dakikalık ısınma aşaması, 40 dakikalık ayakta durma ve/veya oturarak yoga duruşları (asanalar) 15 dakikalık gevşeme aşaması	60	Haftada 2	8-10	16	Olumsuz bir durum yaşanmamış

stimülasyonu ise azalttığı gösterilmiştir. Bu durumun sağladığı fiziksel ve duygusal rahatlama sayesinde yoganın yaşam kalitesini olumlu yönde etkilediği düşünülebilir.

Fiziksel aktivite, kalp yetersizliği hastaları için fonksiyonel durumu, egzersiz performansı, sağlıkla ilgili yaşam kalitesini iyileştirmek ve kalp yetersizliği ile ilgili hastaneye yatışları azaltmak için güncel kılavuzlar tarafından kanıt düzeyi en yüksek olan (Kanıt Düzeyi 1A) Sınıf-1 endikasyon ile önerilmektedir.[35] Bununla birlikte, her üç kalp yetersizliği hastasından sadece birinin mevcut fiziksel aktivite yönergelerini karşıladığı ve %3'ten azının egzersize dayalı kardiyak rehabilitasyona katıldığı bildirilmektedir.[36-38] Ayrıca kalp yetersizliği olan hastaların egzersizin başlatılması ve sürdürülmesinde zorluk yaşadıkları ve bu zorlukların bilgi eksikliği ve egzersiz korkusundan kaynaklandığı belirtilmektedir.[39] Bu nedenle, bu hastaların yaşam kalitelerini iyileştirmeleri için alternatif fiziksel ve zihinsel kondisyon modellerine ihtiyaç duyulmaktadır. Literatürde yer alan çalışmalar yoganın diğer egzersiz müdahaleleri kadar etkili olabileceğini ve diğer egzersiz programlarına alternatif olarak kullanılabileceğini göstermektedir.[40,41] Özellikle düşük yoğunluklu yoga, kalp yetersizliği hastalarına yönelik fiziksel aktivite ve egzersiz türlerine katılım sağlamada olumlu davranış değişikliği için ilk adım olabilir. Yoganın invaziv olmayan, ekonomik ve kolay uygulanan bir girişim olduğu da yapılan çalışmalarda vurgulanmıştır.[42] Ayrıca sistematik derlemeye dahil edilen çalışmalarda yoga uygulamasına bağlı ciddi bir olumsuzluğun yaşanmadığı belirlenmiştir. Özetle mevcut çalışmalar bu yaklaşımın, kalp yetersizliği ve yoga alanında bilimsel donanıma sahip sağlık profesyonelleri tarafından hastaların yaşam kalitesini iyileştirmeye yönelik güvenle uygulanabileceğini göstermektedir.

Bu sistematik derlemede kalp yetersizliği hastalarında yaşam kalitesinin artırılmasında yoganın uygulanma şekli, uygulama sıklığı ve süresi incelenmiştir. Dahil edilen çalışmaların tamamında hatha yoga uygulandığı görülmüştür. Yoganın uygulama sıklığı ve süresine bakıldığında dahil edilen çalışmaların ikisinde sekiz hafta boyunca haftada iki kez, bir çalışmada 12 hafta boyunca haftada iki kez, bir çalışmada da 12 hafta boyunca haftanın her günü uygulanmıştır. Yoga süresi incelendiğinde ise dört çalışmada 60 dakika, bir çalışmada 70 dakika sürdüğü belirlenmiştir. Literatürde benzer nitelikte çalışmalar incelendiğinde yoga uygulamasının 12 hafta, haftada üç kez ve 60 dakika boyunca uygulandığı görülmektedir.[43] Wang ve arkadaşlarının[44] 2020 yılında yapmış olduğu meta-analiz çalışmasında benzer şekilde yoganın çoğunlukla ortalama sekiz ile 12 hafta boyunca ve haftada bir ile iki defa değişen aralıklarda uygulandığı belirlenmiştir. Başka bir meta-analiz çalışmasında ise yoganın genellikle 60 dakika boyunca uygulandığı, yoganın üç ana bileşeni olan dhyana, pranayama ve asanalar ögelerinin uygulandığı gösterilmiştir.[45] Yapılan çalışmalarda yoganın çalışılan örneklemin özelliğine ve uygulama amacına göre farklı uygulama prosedürleri ile uygulandığı saptanmıştır. Bu sistematik derlemeye dahil edilen çalışmalarda da uygulanan yoganın seans sayısı ve süresi farklılık göstermektedir. Literatürde yer alan çalışmalarda yoga müdahalesine yönelik farklı seans sıklığı ve süresi olması nedeniyle metodolojik kalitesi yüksek çalışmalara ihtiyaç olduğu düşünülmektedir. Gelecekte yapılacak olan araştırmalarda farklı yoga bileşenlerinin etkinliğinin karşılaştırılması ve kanıt temelli çalışmalara odaklanılması gerekmektedir. Bu doğrultuda yoga için bir protokol oluşturulmasının gelecekteki çalışma tasarımlarına ve klinik uygulamalara ışık tutacağı düşünülmektedir.

Araştırmanın Sınırlılığı

Bu sistematik derlemenin bazı sınırlılıkları bulunmaktadır. İlk olarak literatür taraması PubMed, Cochrane Library, Scopus ve Web of Sciences veri tabanlarıyla ve yalnızca İngilizce diliyle sınırlı tutulmuştur. Bu durum bazı çalışmaların gözden kaçırılmasına neden olmuş olabilir. İkincisi müdahalenin doğası gereği incelenen birçok çalışmada körleme yapılamamıştır. Katılımcılar veya uygulayıcılar müdahale sırasında körlenmediği için yoganın plasebo etkisi göz ardı edilmemelidir. Üçüncüsü araştırmaya dahil edilen çalışmalar temel katılımcı özellikleri (yaş, ejeksiyon fraksiyonu düzeyi, NYHA evresi vb.) ve yoga müdahale özellikleri (sıklığı, süresi vb.) açısından değişiklik göstermektedir. Ayrıca incelenen çalışmaların sınırlı sayıda olması ve örneklem gruplarının küçük olması bulguların genellenebilirliğini etkileyebilir. Bu durum sistematik derleme sonuçları değerlendirilirken göz önünde bulundurulmalıdır. Son olarak bu sistematik derleme protokolü PROSPERO gibi halka açık bir veri tabanına önceden kaydedilmemiştir. Kapsamlı bir iç protokol takip edilmiş olsa da bu durum şeffaflığı algılama açısından bir eksiklik olarak görülebilir.

Sonuç

Bu sistematik derlemenin sonucunda kalp yetersizliği olan hastalarda yoganın yaşam kalitesi üzerinde olumlu bir etkiye sahip olduğu belirlenmiştir. Ancak derleme kapsamına alınan çalışmaların metodolojik kalitesinin henüz yeterli seviyede olmaması nedeniyle sonuçlar dikkatli yorumlanmalıdır. Öte yandan ulaşılan çalışmalarda yoga uygulamasına bağlı ciddi bir olumsuzluğun yaşanmadığı belirlenmiştir. Bu nedenle hareket kabiliyeti sınırlı olan kalp yetersizliğinde yoganın sertifikalı bir eğitmen tarafından yapılması önerilmektedir. Bu doğrultuda kalp yetersizliği olan hastaların yaşam kalitesini yükseltmek için yoganın hemşirelik bakımında yer alması önerilmektedir. Gelecekteki çalışmalar, kalp yetersizliği hastalarında farklı yoga bileşenlerinin etkinliğinin karşılaştırılmasına odaklanmalıdır. Bu sayede kalp yetersizliği hastalarına yönelik olarak spesifik yoga programları tasarlanabilecektir.

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Kaynaklar

1. Benjamin EJ, Muntner P, Alonso A, et al.; American Heart Association Council on Epidemiology and Prevention Statistics Committee and Stroke Statistics Subcommittee. Heart Disease and Stroke Statistics-2019 Update: A Report From the American Heart Association. *Circulation*. 2019;139(10):e56-e528. Erratum in: *Circulation*. 2020;141(2):e33. [CrossRef]
2. Savarese G, Becher PM, Lund LH, Seferovic P, Rosano GMC, Coats AJS. Global burden of heart failure: a comprehensive and updated review of epidemiology. *Cardiovasc Res*. 2023;118(17):3272-3287. Erratum in: *Cardiovasc Res*. 2023;119(6):1453. [CrossRef]
3. Alpert CM, Smith MA, Hummel SL, Hummel EK. Symptom burden in heart failure: assessment, impact on outcomes, and management. *Heart Fail Rev*. 2017;22(1):25-39. [CrossRef]
4. Avcı A, Gün M. Kalp yetersizliğinde yaşam kalitesini arttırmaya yönelik yeni kanıt temelli uygulamalar. In: *Gün M, ed. Kardiyovasküler Hastalıklar ve Güncel Kanıta Dayalı Bakım Uygulamaları*. Ankara: Türkiye Klinikleri; 2022:25-32.
5. Polikandrioti M, Kalafatakis F, Koutelekos I, Kokoularis D. Fatigue in heart failure outpatients: levels, associated factors, and the impact on quality of life. *Arch Med Sci Atheroscler Dis*. 2019;4:e103-e112. [CrossRef]
6. Niklasson A, Maher J, Patil R, et al. Living with heart failure: patient experiences and implications for physical activity and daily living. *ESC Heart Fail*. 2022;9(2):1206-1215. [CrossRef]
7. Conley S, Feder S, Redeker NS. The relationship between pain, fatigue, depression and functional performance in stable heart failure. *Heart Lung*. 2015;44(2):107-112. [CrossRef]
8. AbuRuz ME. Anxiety and depression predicted quality of life among patients with heart failure. *J Multidiscip Healthc*. 2018;11:367-373. [CrossRef]
9. Reddy YNV, Rikhi A, Obokata M, et al. Quality of life in heart failure with preserved ejection fraction: importance of obesity, functional capacity, and physical inactivity. *Eur J Heart Fail*. 2020;22(6):1009-1018. [CrossRef]
10. Aggelopoulou Z, Fotos NV, Chatziefstratiou AA, Giakoumidakis K, Elefsiniotis I, Brokalaki H. The level of anxiety, depression and quality of life among patients with heart failure in Greece. *Appl Nurs Res*. 2017;34:52-56. [CrossRef]
11. Alaloul F, AbuRuz ME, Moser DK, Hall LA, Al-Sadi A. Factors associated with quality of life in Arab patients with heart failure. *Scand J Caring Sci*. 2017;31(1):104-111. [CrossRef]
12. Johansson I, Joseph P, Balasubramanian K, et al.; G-CHF Investigators. Health-Related Quality of Life and Mortality in Heart Failure: The Global Congestive Heart Failure Study of 23 000 Patients From 40 Countries. *Circulation*. 2021;143(22):2129-2142. [CrossRef]
13. Gok Metin Z, Gulbahar M. The Prevalence of Complementary and Integrative Health Approach Use and Quality of Life Among Patients With Heart Failure: A Cross-sectional, Descriptive, and Comparative Study. *Holist Nurs Pract*. 2021;35(3):123-132. [CrossRef]
14. Öz HS. Yoga and Nursing in Traditional and Complementary Medicine Treatments. *J Tradit Complem Med*. 2020;3(3):399-405. Turkish. [CrossRef]
15. Guddeti RR, Dang G, Williams MA, Alla VM. Role of Yoga in Cardiac Disease and Rehabilitation. *J Cardiopulm Rehabil Prev*. 2019;39(3):146-152. [CrossRef]
16. Ovayolu Ö, Ovayolu N. Evidences in yoga practices. *HUHEMFAD-JOHUFON*. 2019;6(1):44-49. Turkish. [CrossRef]
17. Gonzalez M, Pascoe MC, Yang G, et al. Yoga for depression and anxiety symptoms in people with cancer: A systematic review and meta-analysis. *Psychooncology*. 2021;30(8):1196-1208. [CrossRef]
18. Lai YT, Huang HL, Hsieh CC, et al. The Effects of Yoga Exercise on Blood Pressure and Hand Grip Strength in Chronic Stroke Patients: A Pilot Controlled Study. *Int J Environ Res Public Health*. 2023;20(2):1108. [CrossRef]
19. KauricKlein Z. Effect of yoga on physical and psychological outcomes in patients on chronic hemodialysis. *Complement Ther Clin Pract*. 2019;34:41-45. [CrossRef]
20. Micheletti S, Serra P, Tesei A, et al. Effects of yoga practice on physiological distress, fatigue and QOL in patients affected by breast cancer undergoing adjuvant radiotherapy. *Tech Innov Patient Support Radiat Oncol*. 2022;24:32-39. [CrossRef]
21. Dutta D, Bhattacharya S, Sharma M, Khandelwal D, Surana V, Kalra S. Effect of yoga on glycemia and lipid parameters in type-2 diabetes: a meta-analysis. *J Diabetes Metab Disord*. 2021;20(1):349-367. [CrossRef]
22. Orlygsdottir B, Gunnarsdottir TJ, Thoroddsen A, Vilhjalmsson R. The prevalence and characteristics of yoga or meditation users in Iceland: Results of a national health survey. *Complement Ther Clin Pract*. 2021;45:101487. [CrossRef]
23. Gomes-Neto M, Rodrigues ES Jr, Silva WM Jr, Carvalho VO. Effects of Yoga in Patients with Chronic Heart Failure: A Meta-Analysis. *Arq Bras Cardiol*. 2014;103(5):433-439. [CrossRef]
24. Moher D, Liberati A, Tetzlaff J, Altman DG; PRISMA Group. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS Med*. 2009;6(7):e1000097. [CrossRef]
25. Hür G, Zengin H, Karakaya Suzan Ö, Kolukısa T, Eroğlu A, Çınar N. Turkish adaptation of Joanna Briggs Institute (JBI) critical appraisal checklist for randomized controlled trials. *Sağlık Bilimlerinde İleri Araştırmalar Derg*. 2022;5(2):112-117.
26. Pullen PR, Nagamia SH, Mehta PK, et al. Effects of yoga on inflammation and exercise capacity in patients with chronic heart failure. *J Card Fail*. 2008;14(5):407-413. [CrossRef]
27. Pullen PR, Thompson WR, Benardot D, et al. Benefits of yoga for African American heart failure patients. *Med Sci Sports Exerc*. 2010;42(4):651-657. [CrossRef]
28. Hägglund E, Hagerman I, Dencker K, Strömberg A. Effects of yoga versus hydrotherapy training on health-related quality of life and exercise capacity in patients with heart failure: A randomized controlled study. *Eur J Cardiovasc Nurs*. 2017;16(5):381-389. [CrossRef]
29. Jain AK, Subhash CM, Bhola SV, Kushal M, Ashwini M, Jitendrapal SS. Effect of Yoga Lifestyle in Patients with Heart Failure: A Randomized Control Trial. *Int J Yoga*. 2022;15(1):40-44. [CrossRef]
30. Krishna BH, Pal P, Pal GK, et al. Yoga improves quality of life and functional capacity in heart failure patients. *Biomed Res*. 2014;25(2):178-182.
31. Pan Y, Yang K, Wang Y, Zhang L, Liang H. Could yoga practice improve treatment-related side effects and quality of life for women with breast cancer? A systematic review and meta-analysis. *Asia Pac J Clin Oncol*. 2017;13(2):e79-e95. [CrossRef]
32. Desveaux L, Lee A, Goldstein R, Brooks D. Yoga in the Management of Chronic Disease: A Systematic Review and Meta-analysis. *Med Care*. 2015;53(7):653-661. [CrossRef]
33. Desai R, Tailor A, Bhatt T. Effects of yoga on brain waves and structural activation: A review. *Complement Ther Clin Pract*. 2015;21(2):112-118. [CrossRef]

34. Krishna BH, Pal P, Balachander J, et al. Effect of yoga therapy on heart rate, blood pressure and cardiac autonomic function in heart failure. *J Clin Diagn Res*. 2014;8(1):14-6.
35. Heidenreich PA, Bozkurt B, Aguilar D, et al. 2022 AHA/ACC/HFSA Guideline for the Management of Heart Failure: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. *J Am Coll Cardiol*. 2022;79(17):e263-e421. Erratum in: *J Am Coll Cardiol*. 2023;81(15):1551. [CrossRef]
36. Ye F, Yale S, Zheng Y, et al. Trends in Physical Activity Among US Adults With Heart Failure, 2007-2016. *J Cardiopulm Rehabil Prev*. 2021;41(5):351-356. [CrossRef]
37. Keteyian SJ, Jackson SL, Chang A, et al. Tracking Cardiac Rehabilitation Utilization in Medicare Beneficiaries: 2017 UPDATE. *J Cardiopulm Rehabil Prev*. 2022;42(4):235-245. [CrossRef]
38. Jankowska-Polańska B, Świątoniowska-Lonc N, Sławuta A, Krówczyńska D, Dudek K, Mazur G. Patient-Reported Compliance in older age patients with chronic heart failure. *PLoS One*. 2020;15(4):e0231076. [CrossRef]
39. Albert NM, Forney J, Slifcak E, Sorrell J. Understanding physical activity and exercise behaviors in patients with heart failure. *Heart Lung*. 2015;44(1):2-8. [CrossRef]
40. Gothe NP, McAuley E. Yoga Is as Good as Stretching-Strengthening Exercises in Improving Functional Fitness Outcomes: Results From a Randomized Controlled Trial. *J Gerontol A Biol Sci Med Sci*. 2016;71(3):406-411. [CrossRef]
41. Patil SG, Patil SS, Aithala MR, Das KK. Comparison of yoga and walking-exercise on cardiac time intervals as a measure of cardiac function in elderly with increased pulse pressure. *Indian Heart J*. 2017;69(4):485-490. [CrossRef]
42. Çelik AS, Kılınç T. The effect of laughter yoga on perceived stress, burnout, and life satisfaction in nurses during the pandemic: A randomized controlled trial. *Complement Ther Clin Pract*. 2022;49:101637. [CrossRef]
43. Sharma KNS, Pailoor S, Choudhary NR, Bhat P, Shrestha S. Integrated Yoga Practice in Cardiac Rehabilitation Program: A Randomized Control Trial. *J Altern Complement Med*. 2020;26(10):918-927. [CrossRef]
44. Wang WL, Chen KH, Pan YC, Yang SN, Chan YY. The effect of yoga on sleep quality and insomnia in women with sleep problems: a systematic review and meta-analysis. *BMC Psychiatry*. 2020;20(1):195. [CrossRef]
45. Wibowo RA, Nurámalia R, Nurrahma HA, et al. The Effect of Yoga on Health-Related Fitness among Patients with Type 2 Diabetes Mellitus: A Systematic Review and Meta-Analysis. *Int J Environ Res Public Health*. 2022;19(7):4199. [CrossRef]

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Examination of Type-D Personality, Perceived Social Support, and Psychological Status in Coronary Artery Disease Patients

Koroner Arter Hastalarında D Tipi Kişiliğin, Algılanan Sosyal Desteğin, Psikolojik Durumun İncelenmesi

ABSTRACT

Objective: This study aimed to investigate Type-D personality, perceived social support, and psychological status in patients with coronary artery disease.

Method: This descriptive, cross-sectional, correlational study was conducted between May 2023 and January 2024 with 251 patients admitted to the cardiology departments of a Training and Research Hospital in Istanbul. Data were collected using the Type-D Personality Scale, the Multidimensional Scale of Perceived Social Support (MSPSS), and the Depression-Anxiety-Stress Scale (DASS-21).

Results: The average age of the participants was 61.48 ± 13.45 years. Of the patients, 55% had a previous myocardial infarction (MI), and 64.5% had additional chronic diseases. The mean scores for the total and subscales of the Type-D Personality Scale (Negative Affection, Social Introversion) were 11.81 ± 5.45, 11.01 ± 5.44, and 12.61 ± 5.46, respectively. The mean score for the MSPSS was 73.93 ± 9.79. The average scores for Depression, Anxiety, and Stress were 5.23 ± 3.06, 7.68 ± 3.88, and 7.4 ± 3.43, respectively. A significant negative relationship was found between Negative Affection and Social Introversion and support from private persons, family support, and support from friends, as well as the overall MSPSS score. A significant positive relationship was observed between Negative Affection and Depression, Anxiety, and Stress.

Conclusion: Most patients exhibited a Type-D personality. Perceived social support levels, as well as depression and anxiety levels, were high. Type-D personality negatively affected the perception of social support. Additionally, it was found that Type-D personality traits increased depression, anxiety, and stress scores.

Keywords: Coronary artery disease, nursing, perceived social support, psychological status, type-D personality

ÖZET

Amaç: Bu çalışma, koroner arter hastalarında D tipi kişiliğin, algılanan sosyal desteğin ve psikolojik durumun incelenmesi amacıyla yapılmıştır.

Yöntem: Tanımlayıcı, kesitsel ve ilişki arayıcı olarak tasarlanan bu çalışma, İstanbul'da bir Eğitim ve Araştırma Hastanesi'nin kardiyoloji kliniklerine başvuran 251 hasta ile Mayıs 2023-Ocak 2024 tarihleri arasında yürütülmüştür. Veriler, D Tipi Kişilik Ölçeği, Çok Boyutlu Algılanan Sosyal Destek Ölçeği (ÇBASDÖ) ve Depresyon-Anksiyete-Stres Ölçeği (DASS-21) kullanılarak toplanmıştır.

Bulgular: Bireylerin ortalama yaşı 61,48 ± 13,45'tir. Hastaların %55'i daha önce miyokard enfarktüsü (MI) geçirmiş, %64,5'inde ek kronik hastalık bulunmaktadır. D Tipi Kişilik Ölçeği toplam ve alt boyutları (Negatif Duygulanım, Sosyal İçe Dönüklük) puan ortalaması sırasıyla 11,81 ± 5,45, 11,01 ± 5,44, 12,61 ± 5,46'dır. ÇBASDÖ ortalama değeri 73,93 ± 9,79'dur. Depresyon ortalaması 5,23 ± 3,06, anksiyete ortalaması 7,68 ± 3,88, stres ortalaması ise 7,4 ± 3,43'tür. Negatif Duygulanım ve Sosyal İçe Dönüklük ile Özel Kişi Desteği, Aile Desteği, Arkadaş Desteği ve ÇBASDÖ arasında negatif yönde anlamlı bir ilişki bulunmuştur. Negatif Duygulanım ile depresyon, anksiyete ve stres arasında pozitif yönde anlamlı bir ilişki olduğu saptanmıştır.

Sonuç: Hastaların çoğunda D tipi kişilik özelliği görülmüştür. Algılanan sosyal destek düzeyi düşük, depresyon ve anksiyete düzeyleri ise yüksek bulunmuştur. D tipi kişilik, sosyal destek algısını olumsuz etkilemekte ve depresyon, anksiyete, stres düzeylerini artırmaktadır.

Anahtar Kelimeler: Koroner arter hastalığı, hemşirelik, algılanan sosyal destek, psikolojik durum, D tipi kişilik

ORIGINAL ARTICLE
KLİNİK ÇALIŞMA

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Introduction

Coronary artery disease (CAD) is a condition where the coronary artery blood flow that supports the myocardium of the heart is narrowed or blocked, usually by an atheromatous plaque.[1] CAD is the most common cardiovascular disease. Atherosclerosis in the coronary arteries is a slowly progressive process that begins in childhood. In some individuals, it may progress more rapidly and appear in their 30s, while in others, it may remain silent until their 50s or 60s.[2] In coronary heart disease, risk factors are both genetic and environmental, and can be classified as modifiable or non-modifiable. Non-modifiable risk factors include age, male sex, race, and heredity. Modifiable risk factors for coronary heart disease include smoking and exposure to cigarette smoke, hypercholesterolemia, hypertension (HT), uncontrolled diabetes, obesity, unhealthy diet, sedentary lifestyle, and excessive stress.[1] The process of atherosclerosis in CAD begins with the deposition of lipids in the intima of the arterial wall, followed by a chronic low-level inflammatory response. Plaque formation leads to narrowing of the vessel diameter and a reduction in blood flow to the area supplied by the vessel. The signs and symptoms of CAD vary depending on the location and degree of narrowing of the arterial lumen. Ischemia occurs due to decreased blood flow to the myocardium, and chest pain caused by ischemia is defined as angina pectoris.[2]

In coronary artery disease patients, myocardial infarction (MI) resulting from acute coronary syndrome not only has a high mortality rate but also poses risks to vital integrity and causes numerous psychosocial problems.[3] Personality structure is a key determinant of chronic stress, which is one of these psychosocial issues. Personality is a set of innate and acquired traits consistently exhibited by an individual, distinguishing them from others.[4] These personality traits, which affect every aspect of an individual's life and are consistent within themselves, also play a role in the development of heart disease.[5] Individuals who are depressed, anxious, tense, or angry, who tend to experience negative emotions more frequently, have difficulty expressing themselves to others, and exhibit distressing personality traits are considered to have a Type-D personality.[6] Type-D personality was defined by Denollet et al.[7] as high levels of negative affection and social inhibition. This personality type has been shown to predict poor prognosis in patients with chronic heart disease.[8]

Coronary artery disease (CAD) patients face significant challenges in performing activities of daily living (ADLs). The loss of function impacts them not only physically but also mentally, socially, and economically. As the disease progresses, it leads to increased dependency, limited social activities, difficulty performing roles within the family and community, and social isolation. This intensifies the need for social support.[9] Social support is defined as a network that provides psychological and physical resources, helping individuals cope with stress.[10]

Depression, anxiety, and psychological distress are common among people with coronary artery disease. Studies have shown that CAD patients often experience high levels of hopelessness and depression, which hinder their ability to cope with the disease, impair interpersonal relationships, affect physical well-being, and disrupt the healing process.[11]

MAIN POINTS

- The Type-D personality trait was observed in most of the patients.
- Perceived social support, as well as depression and anxiety levels, were high.
- Type-D personality negatively impacted the perception of social support.
- It was also found that Type-D personality increased depression, anxiety, and stress scores.

Psychosocial risk factors, such as low socioeconomic status, lack of social support, work and family stress, depression, and anxiety, worsen the risk of developing CAD and negatively impact its clinical course and prognosis. These psychosocial factors should be recognized in clinical practice, and their implications should be discussed with patients. Anxiety and depression must be assessed in patients with cardiovascular disease. Those at risk or exhibiting clinical symptoms of anxiety and depression should be referred for professional mental health care. The European Society of Cardiology recommends assessing psychosocial risk factors in its latest guidelines.[12] Coping with CAD is a long-term, dynamic process that involves managing a range of emotions and adjustment needs. Coping may be challenging if the patient denies the seriousness of their condition, experiences stress, depression, and emotional exhaustion, or struggles with family interactions.[13] This study was designed as descriptive and correlational, aiming to investigate Type-D personality, perceived social support, and psychological status in patients with coronary artery disease.

Material and Method

Design

This descriptive, cross-sectional, and correlational study was conducted to investigate Type-D personality, perceived social support, psychological state, and coping attitudes in patients with coronary artery disease.

Place and Time of the Study

The study was conducted at a Training and Research Hospital in Istanbul, from May 15, 2023, to January 13, 2024. The Departments of Cardiology at the hospital where the study was conducted have a total of 160 beds, 45 nurses, 5 charge nurses, 25 clinical support staff, as well as specialist and assistant cardiologists.

Sample and Population of the Study

The population of the study consisted of patients who applied to the Cardiology Department of the hospital during the study period and continued their treatment at this facility. The study sample included 251 patients who continued their treatment in the cardiology outpatient clinic during the study period and met the inclusion criteria. A sample size analysis was conducted using version 3.1 of the GPower program, which determined an effect size of 0.20 with 90% power and a 0.05 margin of error for the current sample (n = 251).

Inclusion Criteria for the Study

The inclusion criteria for participation in the study were as follows:

- Voluntary consent to participate in the research
- Aged 18 years or older
- Diagnosed with coronary artery disease
- Cognitive competence to answer the questions
- No communication problems

Data Collection Tools

The Personal Information Form, Type-D Personality Scale, Multidimensional Scale of Perceived Social Support (MSPSS), and Depression-Anxiety-Stress Scale (DASS-21) were used to collect the data.

Personal Information Form

This form, developed by the researcher based on a review of the literature, consists of 18 questions about sociodemographic characteristics (e.g., age, sex, marital status, educational status, number of children, employment status, occupation, income-expenditure status, place of residence, and cohabitants) and medical information (e.g., smoking, alcohol use, body mass index, disease diagnosis, duration of diagnosis, comorbidities, and family history of heart disease).[14-16]

Type-D Personality Scale

The Type-D Personality Scale was developed by Denollet[7] to measure negative affection and social introversion. Öncü and Köksoy Vayısoğlu[17] conducted a validity and reliability study of the scale in the Turkish population. The 14-item, 5-point Likert-type scale is based on the subjective evaluation of individuals and includes two subscales: negative affection (items 2, 4, 5, 7, 9, 12, 13) and social introversion (items 1, 3, 6, 8, 10, 11, 14). Items 1 and 3 are reverse coded. Each statement is scored on a scale from 0 to 4 points, as follows: 'wrong, partially wrong, undecided, partially right, right'. Subscales can take values between 0 and 28. The cut-off score for each subscale is ≥ 10. Participants who score 10 points or higher in both subscales are classified as having a Type-D personality. In the Turkish validity-reliability study of the scale, Cronbach's alpha was found to be 0.85 for negative affection and 0.76 for social introversion.[17] In the current study, the Cronbach's alpha was found to be 0.65 for negative affection and 0.70 for social introversion.

Multidimensional Scale of Perceived Social Support (MSPSS)

The MSPSS was developed by Zimet et al. to subjectively measure the adequacy of social support. Its validity and reliability in Türkiye were first conducted by Eker et al.[18] It is a 7-point Likert-type scale consisting of 12 items, ranging from "absolutely no" to "absolutely yes." The scale consists of 3 subscales, each containing 4 items. These subscales assess family, friend, and private person support. The questions for the family subscale are items 3, 4, 8, and 11; for the friend subscale, they are items 6, 7, 9, and 12; and for the private person subscale, they are items 1, 2, 5, and 10. The scores of the items within each subscale are summed to obtain the subscale score, and the total score of the scale is obtained by summing the scores of all 3 subscales. The minimum score for each subscale is 4, and the maximum score is 28. The lowest possible total score on the scale is 12, and the highest is 84. High scores indicate high perceived social support. The Cronbach's alpha of the scale is 0.89. In the present study, it was found to be 0.68.

Depression-Anxiety-Stress Scale (DASS-21)

The DASS-21 was developed by Lovibond to measure depression, anxiety, and stress levels. The Turkish validity and reliability were performed by Sarıçam. The scale consists of 21 items and three subscales. It is a 4-point Likert-type scale ranging from "never" to "always." The subscales of the scale include depression (items 3, 5, 10, 13, 16, 17, and 21), anxiety (items 2, 4, 7, 9, 15, 19, and 20), and stress (items 1, 6, 8, 11, 12, 14, and 18). As the score for each item increases, the level of depression, anxiety, and stress increases. A score of five or more points in the depression subscale, four or more points in the anxiety subscale, and eight or more points in the stress subscale indicates that the individual may be experiencing the problem. The Cronbach's alpha for the scale was 0.87 for depression, 0.85 for anxiety, and 0.81 for stress.[19] In this study, the Cronbach's alpha values were found to be 0.75 for depression, 0.73 for anxiety, and 0.71 for stress.

Data Analysis

The data were analyzed using IBM SPSS 25.0 (Statistical Package for the Social Sciences, IBM Corp., Armonk, New York, USA). Descriptive statistical values (mean & SD, median, frequency, and ratio) were used to evaluate the study data. The homogeneity of responses was assessed using the Kolmogorov-Smirnov method. Correlation analysis was employed to examine the relationships between variables. The significance level of the detected data was evaluated at 5%, with the reliability level set at 95%.

Ethical Considerations

Approval was received from the Istanbul Sabahattin Zaim University Ethics Committee (Approval Number: 2023/01, Date: 27.01.2023), and permission was obtained from the Istanbul Provincial Directorate of Health (dated 10.05.2023, numbered 215138065) to conduct the study at the Training and Research Hospital. Before the study commenced, the purpose of the study was explained to all participants, and their consent was obtained using an informed consent form. The study was conducted according to the ethical standards of the Declaration of Helsinki. Participants voluntarily participated, and their personal data were kept confidential. The researchers did not use any AI-assisted technologies (e.g., large language models, chatbots, or image generators).

Results

The average age of the patients was 61.48 ± 13.45 years, the average duration of diagnosis (in years) was 1.02 ± 0.15, and the average BMI was 27.94 ± 5.56. Of the patients, 72.5% were male, 93.6% were married, 49% had a primary school education, and 95.6% had children. Additionally, 79.7% were unemployed, 45.8% were retired, 50.2% had income equal to expenses, 63.7% lived with their spouse and children, 62.9% did not smoke, and 85.7% did not consume alcohol (Table 1).

The diagnosis of the disease was myocardial infarction (MI) in 97.6% of the patients. Of these, 55% (n = 138) had a previous MI, 46.2% had a family history of heart disease, 64.5% had an additional chronic disease, and 52.5% had diabetes (Table 2).

Table 1. Sociodemographic characteristics of individuals

Variable	$\bar{X}$ ± SD	Min–Max (median)
Age	61.48 ± 13.45	19–92 (62)
Time since diagnosis (years)	1.02 ± 0.15	1–2 (1)
Body Mass Index	27.94 ± 5.56	15.12–55.7 (27.34)
	n	%
Gender		
Female	69	27.5
Male	182	72.5
Marital status		
Married	235	93.6
Single	16	6.4
Education level		
Illiterate		
Primary school	22	8.8
Middle school	123	49.0
High school	35	13.9
University	41	16.3
Children		
Yes	240	95.6
No	11	4.4
Employment status		
Employed	51	20.3
Unemployed	200	79.7
Occupation		
Retired	115	52.3
Housewife	52	23.6
Tradesmen	27	12.3
Other	26	11.8
Income level		
Income < Expenses	98	39.0
Income = Expenses	126	50.2
Income > Expenses	27	10.8
Living arrangement		
Alone	13	5.2
With spouse	71	28.3
With spouse and children	160	63.7
With parent(s)	7	2.8
Smoking status		
Yes	93	37.1
No	158	62.9
Alcohol use		
Yes	36	14.3%
No	215	85.7%

SD, Standard deviation; Min, Minimum; Max, Maximum.

Table 2. Characteristics of individuals regarding the disease

Variable	n	%
Disease diagnosis		
Myocardial infarction	245	97.6
Angina pectoris	6	2.4
Previous myocardial ınfarction status		
Yes	138	55.0
No	113	45.0
Family history of heart disease		
Absent	135	53.8
Present	116	46.2
Concomitant additional chronic disease status		
Absent	89	35.5
Present	162	64.5
Concomitant additional chronic disease*		
Asthma	68	42.0
Hypertension	46	28.4
Diabetes	85	52.5
Heart diseases	8	4.9
Thyroid	3	1.9
Kidney	4	2.5
Cancer	4	2.5

*, Multiple options checked.

The average scores for the various scales were as follows: Negative Affection (11.01 ± 5.44), Social Introversion (12.61 ± 5.46), Private Person Support (25.79 ± 3.00), Family Support (22.85 ± 4.74), Friend Support (25.29 ± 3.41), MSPSS (73.93 ± 9.79), Depression (5.23 ± 3.06), Anxiety (7.68 ± 3.88), Stress (7.40 ± 3.43), Self-help (17.30 ± 4.88), Approach (24.96 ± 3.57), Adaptation (23.34 ± 3.81), Avoidance (13.08 ± 4.18), Self-punishment (20.01 ± 3.64), and the Coping Attitudes Assessment Scale (98.69 ± 10.12). Among the patients, 67.7% exhibited Type-D personality (Table 3).

There was a significant negative relationship between Negative Affection and support from a private person ($r = -0.233$, $P < 0.01$), family support ($r = -0.170$, $P < 0.01$), friend support ($r = -0.206$, $P < 0.01$), and the Multidimensional Scale of Perceived Social Support ($r = -0.209$, $P < 0.01$). A significant positive relationship was found between Negative Affection and depression ($r = 0.168$, $P < 0.01$), anxiety ($r = 0.149$, $P < 0.05$), and stress ($r = 0.138$, $P < 0.05$). A significant negative relationship was detected between Social Introversion and private person support ($r = -0.176$, $P < 0.01$), family support ($r = -0.182$, $P < 0.01$), friend support ($r = -0.136$, $P < 0.05$), and the Coping Attitudes Assessment Scale ($r = -0.169$, $P < 0.01$). A negative correlation was found between stress and private person support ($r = -0.145$, $P < 0.05$), friend support ($r = -0.170$, $P < 0.01$), and MSPSS ($r = -0.142$, $P < 0.05$) (Table 4).

Discussion

The chronicity of coronary artery disease, whether over many years or with an acute onset, can be a major stress factor.[3] The hormones cortisol and adrenaline, released under intense stress, have significant effects on the body, potentially leading to both physical and mental strain.[20,21] Psychosocial risk factors must be identified in clinical practice, and the medical implications should be discussed with patients. Patients at risk, or those presenting

Table 3. Type-D Personality Scale, Multidimensional Scale of Perceived Social Support, Anxiety-Depression and Stress Scale, Coping Attitudes Assessment Scale Assessments

Variables	$\bar{X}$ ± SD	Min-Max (median)
Type-D Personality Scale		
Negative affection	11.01 ± 5.44	0-28 (10)
Social introversion	12.61 ± 5.46	1-28 (12)
Sub-scales of Multidimensional Scale of Perceived Social Support		
Private ındividual support	25.79 ± 3	12-28 (27)
Family support	22.85 ± 4.74	8-28 (23)
Friend support	25.29 ± 3.41	6-28 (26)
Multidimensional Scale of Perceived Social Support	73.93 ± 9.79	36-84 (75)
Depression-Anxiety-Stress Scale		
Depression	5.23 ± 3.06	0-20 (5)
Anxiety	7.68 ± 3.88	0-21 (8)
Stress	7.4 ± 3.43	0-19 (7)
Coping Attitudes Assessment Scale		
Self-Help	17.3 ± 4.88	6-24 (17)
Approach	24.96 ± 3.57	7-28 (26)
Adaptation	23.34 ± 3.81	7-28 (24)
Avoidance	13.08 ± 4.18	1-26 (13)
Self-Punishment	20.01 ± 3.64	10-24 (21)
	n	**%**
Non-Type-D Personality	81	32.3
Type-D Personality	170	67.7

SD, Standard deviation; Min, Minimum; Max, Maximum.

clinical symptoms of anxiety and depression, must be referred for professional mental health care.[6] It is crucial to evaluate coping attitudes for CAD and provide specific interventions to encourage the use of more positive coping strategies, such as problem-focused approaches.[22] The aim of the present study was to investigate Type-D personality, perceived social support, and psychological state in patients with coronary artery disease. Type-D personality traits were observed in the majority of the sampled patients. At the same time, Social Introversion, which is one of the subscales of the Type-D Personality Scale, was found to be higher compared to Negative Affection. Type-D personality has been considered both a vulnerability for the emergence of heart disease and an aggravating factor that negatively impacts the health outcomes of cardiovascular disease (CVD), especially post-myocardial infarction (MI). Dysphoria, anxiety, and irritability are commonly observed in Negative Affection, a subscale of Type-D personality, which has been recognized as being associated with CVD. In the other subscale, Social Introversion, fear of being disapproved of or disliked by others, along with difficulty expressing behaviors, are common features.[8] In the literature, some studies report results that align with the present study's findings. Kauw et al.[23] applied the Type-D Personality Scale to 225 individuals with CVD and found Type-D personality traits in 21% of the patients. In a study by Enatescu,[8] conducted with a sample group of 221 coronary artery disease patients, 19% exhibited Type-D personality traits. Manoj et al.[24] conducted a study with patients diagnosed with MI, where 50.7% of the patient group had Type-D personality traits. Heo and Kim[25] studied the Type-D Personality scale on a group of 90 patients with heart failure, finding high levels of Negative Affection and Social Introversion in 54% of the patients. Type-D personality is a well-established independent risk factor in patients with CAD and is prospectively associated with worse clinical and patient-reported outcomes.[26] Few studies have examined the associations between Negative Affection and Social Introversion and CVD.[27] The finding that Social Introversion scores were higher than Negative Affection among patients adds a novel dimension to the existing literature. This highlights the need for nurses to consider not only physical but also psychosocial factors in the care of patients with cardiovascular disease, especially post-myocardial infarction. By identifying Type-D personality traits early, nurses can implement more holistic and individualized care plans, potentially improving patient outcomes and long-term recovery.

In the present study, the level of perceived social support was high in the sample group with CAD. It was observed that the greatest support was perceived from friends and private people. Köseoğlu Örnek et al.[28] measured the perceived social support levels of cardiovascular patients in their study. According to the results, the level of perceived social support was found to be high when the patient had individuals nearby to provide support during the care process. According to the results of the studies by Pushkarev et al.[29] and Hermano et al.[30] the level of social support perceived by the patients was found to be high. Kažukauskienė et al.[31] found that individuals with CAD experienced lower mental

Table 4. Type-D Personality Scale, Multidimensional Scale of Perceived Social Support, Depression-Anxiety-Stress Scale Correlation Analysis

	1	2	3	4	5	6	7	8	9
1. Negative affection									
r	1.000								
P	–								
2. Social introversion									
r	**0.611***	1.000							
P	0.000	–							
3. Private individual support									
r	**-0.233***	**-0.176***	1.000						
P	0.000	0.005	–						
4. Family support									
r	**-0.170***	**-182***	**0.684***	1.000					
P	0.007	0.004	0.000	–					
5. Friend support									
r	**-0.206****	**-0.136***	**0.786***	**0.735***	1.000				
P	0.001	0.031	0.000	0.000	–				
6. Multidimensional scale of perceived social support									
r	**-0.209***	**-0.169***	**0.865***	**0.927***	**0.896***	1,000			
P	0.001	0.007	0.000	0.000	0.000	–			
7. Depression									
r	**0.168***	0.099	-0.101	0.059	-0.083	-0.034	1.000		
P	0.008	0.117	0.112	0.352	0.191	0.592	–		
8. Anxiety									
r	**0.149***	0.062	-0039	0.003	-0096	-0.044	**0.559***	1.000	
P	0.018	0.329	0.543	0.956	0.132	0.486	0.000	–	
9. Stress									
r	**0.138***	0	-0.145*	-0.098	**-170***	**-0.142***	**0.416***	**0.411***	1.000
P	0.028	0.127	0.022	0.123	0.007	0.025	0.000	0.000	–

Spearman's *: P < 0.0.

and physical fatigue and decreased activity thanks to social support from friends. It can be seen that people usually receive more social support from friends and private people. Friends and significant others are the people with whom we have the closest emotional relationships. They help patients cope with emotional challenges such as stress, fear, anxiety, and depression. Emotional support contributes positively to the healing process by keeping the patient's morale high. Friends and family also reduce the patient's sense of isolation by encouraging participation in social activities. Social activities and spending time outdoors are thought to improve the patient's overall mood and increase their sense of social connectedness. Close friends and family members have a better understanding of the patient's individual needs, limitations, and personal challenges. This understanding allows them to provide support that is tailored to the patient's specific circumstances and enables the patient to be more self-expressive. For these reasons, perceived social support from friends and loved ones for people with coronary artery disease is thought to contribute to both the physical and emotional healing process by increasing the overall well-being of the patient.

According to the means of depression, anxiety, and stress in the present study, the presence of depression and anxiety was found to be high in our sample group with CAD. The results are similar to those found in the literature. Erşan et al.[3] reported that patients had high levels of depression and anxiety in their study. According to Chen et al.,[32] anxiety disorders are common in patients with CVD and have a higher prevalence than in the general population. It has been suggested that anxiety disorders may contribute to the onset and development of CVDs. In a study conducted by Upadhyay et al.[33] with 103 acute MI patients, depression was found in 21.36% of patients. It was reported that the risk of new cardiovascular events and mortality increased almost twofold in patients who developed depression after MI. According to Dar et al.,[34] stress is associated with acute coronary events independent of other cardiovascular risk markers. The INTERHEART study, which included a sample of approximately 25,000 participants from more than fifty countries, showed that individuals who had chronic stress had more than double the risk of developing MI compared to individuals without chronic stress.[34] In the meta-analysis of 46 studies by Emdin et al.,[35] anxiety was associated

with a 35% higher risk of heart failure, 71% higher risk of stroke, and 41% higher risk of cardiovascular mortality and CAD. Cohen et al.[10] stated that one in every 5 patients with CAD or heart failure is depressed, and this prevalence is at least 3 times higher than in the general population. Depression is linked to the development and progression of heart failure and other CVDs. Despite the negative impact of depression, anxiety, and stress on patients with CVD, these disorders are under-diagnosed and undertreated in high-risk populations.[36,37] When the means of depression, anxiety, and stress are considered separately, anxiety was found to be more pronounced in our sample group compared to the other variables. In a meta-analysis of 20 studies examining the association of anxiety with CAD, Roest et al.[38] found that individuals who were initially healthy and had high anxiety were at increased risk for CAD. The prevalence of anxiety disorder was found to be higher in individuals with CVD.[39] In stable coronary heart disease patients, anxiety prevalence rates ranged from 16% to 42%, whereas in patients shortly after MI, these rates ranged from 20% to 50%. Patients were reported to experience anxiety symptoms as severe as those experienced by an inpatient in a psychiatric ward.[40] The experience of the disease in the immediate environment is thought to be an important factor that leads individuals to experience anxiety. According to current research in the literature, the presence of depression, anxiety, and stress can be considered an important predisposing factor for CAD and other chronic diseases. It is believed that close monitoring of markers of depression, anxiety, and stress in individuals hospitalized with CAD will contribute to quality care and effective disease management.

In the present study, as Type-D personality traits and stress increased, the level of social support perceived by the patients decreased. It is well known that perceived social support is closely linked to health outcomes in individuals with CAD.[31] According to Ginting et al.,[41] individuals with Type-D personality tend not to share their feelings in social interactions due to fear of reaction or disapproval, resulting in a lack of perceived social support. It has been shown that CAD patients with Type-D personality perceive less social support compared to patients without Type-D personality.[42] Patients interpret social support more negatively and feel insecure in social interactions.[43] Social support is one of the most reliable predictors of morbidity and mortality, acting as a buffer to avoid or mitigate the detrimental long-term health effects related to traumatic events.[44] High levels of social support are considered a buffer that reduces the negative impacts of stress, with positive impacts on the course of various pathological processes. Social support can improve the prognosis of patients with CAD.[29] According to the study by Upadhyay et al.[33] with 103 patients with acute MI, some of the problems associated with the disease, such as depression and stress, combine to cause a decrease in the level of perceived social support. Due to decreased perception of social support, limited physical and social activity may be observed, and CVD risk may increase. In this context, it is suggested that if the necessary emotional support is provided to patients in a timely manner, the level of perceived social support can be improved, and a healthy lifestyle will be ensured. In the presence of stress, social support mechanisms can have beneficial effects on stressors by responding to the needs of the recipient.[44] Accordingly, it is thought that inadequate emotional and social interaction in individuals with poor perceptions of social support may lead to some psychological symptoms and negative health outcomes, such as negative affection and social introversion.

In the study, depression, anxiety and stress levels increased as negative affection increased in patients. Carney and Freedland[45] stated that depression is a known common risk marker in CVD morbidity and mortality in individuals with CAD and is often associated with Type-D personality. Al-Qezweny et al.[46] associated anxiety symptoms with Type-D personality, depression and poor prognosis in CAD. Socially introverted individuals are more vulnerable to developing anxiety and therefore individuals with Type-D personality are at high risk of experiencing high levels of anxiety symptoms.[47] This suggests that the negative affection that may be experienced during the course of CAD may cause the individual to have negative thoughts and lead to an anxious, stressful, and depressive temperament.

Limitations of the Study

Due to the cross-sectional design of the study, it was not possible to investigate dynamic changes over time. Because of the sample size and limited sample selection, it is not possible to generalize the results. Since a self-reported measure was used, there may have been information bias.

Conclusion

In the sample group diagnosed with coronary artery disease, high levels of Type-D personality traits and perceived social support were found. The levels of depression and anxiety in the patients of the current study were also found to be high. Low perceived social support levels and high depression, anxiety, and stress levels were detected in patients with Type-D personality traits. In line with these results, since it is known that Type-D personality is a negative factor in terms of the occurrence of CAD and the course of the disease, personality traits are too important to be ignored. Therefore, it is recommended that the psychological status must not be overlooked in addition to the medical follow-up of patients, the social support mechanisms provided by family, friends, and private individuals during the treatment process must be maintained, and the current study must be adapted to larger and more diverse sample groups.

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References

1. Gülhan Güner S, Nural N. Coronary Artery Disease: Etiology and Pathogenesis. In: Nural N, ed. *Cardiovascular Diseases Nursing*. 1st ed. Ankara: Türkiye Klinikleri; 2020:1-6. Turkish.
2. Badır A, Demir Korkmaz F. Coronary Artery Diseases. In: Karadakovan A, Eti Aslan F, eds. *Care in Internal and Surgical Diseases*. Ankara: Akademisyen Kitabevi; 2020. Turkish.
3. Erşan EE, Kelleci M, Baysal B. A review of psychosocial adjustment, depression, anxiety and stress levels in cardiac patients. *Turkish J Clin Psy*. 2013;16(4):214-224.
4. Ozdemir O, Ozdemir P, Kadak M, Nasiroglu S. Personality development. *Current Approaches in Psychiatry*. 2012;4(4):566-589. [CrossRef]
5. Dirik G, Şahin G. The Relationship of Personality Characteristics, Hostility and Social Support with Anxiety and Depression in Myocardial Infarction Patients. *UUFASJSS*. 2008;9(15):249-266.
6. Yıldırım NK, Öztürk S. Current psychosocial approaches in cardiovascular diseases. Turk J Card Nur. 2016;7(60):60-68. [CrossRef]
7. Denollet J, Trompetter HR, Kupper N. A review and conceptual model of the association of Type D personality with suicide risk. *J Psychiatr Res*. 2021;138:291-300. [CrossRef]
8. Enatescu VR, Cozma D, Tint D, et al. The Relationship Between Type D Personality and the Complexity of Coronary Artery Disease. *Neuropsychiatr Dis Treat*. 2021;17:809-820. [CrossRef]
9. Aydemir Y, Doğu Ö, Amasya A, Yazgan B, Gazioğlu EÖ, Gündüz H. Evaluation of Anxiety and Depression with Patient Characteristics in Patients with Chronic Respiratory and Heart Disease. *Sakarya Med J*. 2015;5(4):199-203. [CrossRef]
10. Cohen BE, Edmondson D, Kronish IM. State of the Art Review: Depression, Stress, Anxiety, and Cardiovascular Disease. *Am J Hypertens*. 2015;28(11):1295-1302. [CrossRef]
11. Çam O, Nehir S. Examination of the relationship between psychosocial adjustment and depression and anxiety levels of patients with myocardial infarction. *EGEHFD*. 2011;27(2):47-59. [CrossRef]
12. Knuuti J, Wijns W, Saraste A, et al.; ESC Scientific Document Group. 2019 ESC Guidelines for the diagnosis and management of chronic coronary syndromes. *Eur Heart J*. 2020;41(3):407-477. Erratum in: *Eur Heart J*. 2020;41(44):4242. [CrossRef]
13. Salminen-Tuomaala M, Astedt-Kurki P, Rekiaro M, Paavilainen E. Coping Experiences: A Pathway towards Different Coping Orientations Four and Twelve Months after Myocardial Infarction-A Grounded Theory Approach. *Nurs Res Pract*. 2012;2012:674783. [CrossRef]
14. Annaç S. *Examination of healthy lifestyle behaviors and quality of life in individuals with coronary artery disease*. Master's Thesis. Hasan Kalyoncu University; 2019.
15. Sakman Z. *Examination of Sleep Quality and Affecting Factors in Individuals with Coronary Artery Disease*. Master's Thesis. Hasan Kalyoncu University; 2019.
16. Serçin Bayındır K. *Knowledge Level and Educational Needs of Coronary Artery Patients*. Master's Thesis. Istanbul Sabahattin Zaim University; 2021.
17. Öncü E, Köksoy Vayısoğlu S. Validity and reliability study of Type-D personality scale in Turkish population. *Ankara Med J*. 2018;18(4):646-656. [CrossRef]
18. Eker D, Arkar H, Yaldız H. Factor structure, validity and reliability of the revised form of the multidimensional scale of perceived social support. *Turk Psikiyatri Derg*. 1995;10(34):45-55.
19. Sarıçam H. The psychometric characteristics of Turkish version of depression anxiety stress Scale-21 (DASS-21) in health control and clinical samples. *JCBPR*. 2018;7(1):19-30. [CrossRef]
20. Burford NG, Webster NA, Cruz-Topete D. Hypothalamic-Pituitary-Adrenal Axis Modulation of Glucocorticoids in the Cardiovascular System. *Int J Mol Sci*. 2017;18(10):2150. [CrossRef]
21. Dias Dde S, Resende MV, Diniz Gdo C. Patient stress in intensive care: comparison between a coronary care unit and a general postoperative unit. *Rev Bras Ter Intensiva*. 2015;27(1):18-25. [CrossRef]
22. Sadr Bafghi SM, Ahmadi N, Yassini Ardekani SM, et al. A Survey of Coping Strategies with Stress in Patients with Acute Myocardial Infarction and Individuals Without a History of Fixed Myocardial Infarction. *Cardiol Res*. 2018;9(1):35-39. [CrossRef]
23. Kauw D, Schoormans D, Sieswerda GT, et al. Type D Personality Associated with Increased Risk for Mortality in Adults With Congenital Heart Disease. *J Cardiovasc Nurs*. 2022;37(2):192-196. [CrossRef]
24. Manoj MT, Joseph KA, Vijayaraghavan G. Type D Personality and Myocardial Infarction: A Case-Control Study. *Indian J Psychol Med*. 2020;42(6):555-559. Erratum in: *Indian J Psychol Med*. 2023;45(6):660. [CrossRef]
25. Heo JM, Kim CG. The mediating effect of resilience on the relationship between Type D personality and self-care behavior in patients with heart failure. *Jpn J Nurs Sci*. 2020;17(4):e12359. [CrossRef]
26. Kupper N, Denollet J. Type D Personality as a Risk Factor in Coronary Heart Disease: a Review of Current Evidence. *Curr Cardiol Rep*. 2018;20(11):104. [CrossRef]
27. Torgersen KS, Sverre ECB, Weedon-Fekjær H, Andreassen OA, Munkhaugen J, Dammen T. Risk of recurrent cardiovascular events in coronary artery disease patients with Type D personality. *Front Psychol*. 2023;14:1119146. [CrossRef]
28. Köseoğlu Örnek Ö, Günaydin HN, Kolaç N, Açikgöz B, Kavala AA, Türkyilmaz S. Anxiety levels of cardiovascular surgery patients: examination of coping methods, Self-Efficacy level and social support mechanisms: descriptive and support during acute psychological stress. *Turk Klin Cardiovasc Sci*. 2011;86(2):137-142.
29. Pushkarev G, Kuznetsov V, Yaroslavskaya E, Bessonov I. Social support for patients with coronary artery disease after percutaneous coronary intervention. *J Psychosom Res*. 2019;119:74-78. [CrossRef]
30. Hermano BR, De Barros ALBL, De Lima Lopes J, Santos MAD, Lopes CT, Santos VB. Evaluation of social support and medication adherence in patients with coronary artery disease. *Rev Eletr Enferm*. 2021;23:66979,1-8. [CrossRef]
31. Kazukauskiene N, Bunevicius A, Gecaite-Stonciene J, Burkauskas J. Fatigue, Social Support, and Depression in Individuals with Coronary Artery Disease. *Front Psychol*. 2021;12:732795. [CrossRef]
32. Chen X, Xu L, Li Z. Autonomic Neural Circuit and Intervention for Comorbidity Anxiety and Cardiovascular Disease. *Front Physiol*. 2022;13:852891. [CrossRef]
33. Upadhyay V, Bhandari SS, Rai DP, Dutta S, García-Grau P, Vaddiparti K. Improving depression and perceived social support enhances overall quality of life among myocardial infarction survivors: necessity for integrating mental health care into cardiac rehabilitation programs. *Egypt J Neurol Psychiatr Neurosurg*. 2022;58:87. [CrossRef]
34. Dar T, Radfar A, Abohashem S, Pitman RK, Tawakol A, Osborne MT. Psychosocial Stress and Cardiovascular Disease. *Curr Treat Options Cardiovasc Med*. 2019;21(5):23. [CrossRef]
35. Emdin CA, Odutayo A, Wong CX, Tran J, Hsiao AJ, Hunn BH. Meta-Analysis of Anxiety as a Risk Factor for Cardiovascular Disease. *Am J Cardiol*. 2016;118(4):511-519. [CrossRef]
36. Celano CM, Villegas AC, Albanese AM, Gaggin HK, Huffman JC. Depression and Anxiety in Heart Failure: A Review. *Harv Rev Psychiatry*. 2018;26(4):175-184. [CrossRef]
37. Sbolli M, Fiuzat M, Cani D, O'Connor CM. Depression and heart failure: the lonely comorbidity. *Eur J Heart Fail*. 2020;22(11):2007-2017. [CrossRef]
38. Roest AM, Martens EJ, de Jonge P, Denollet J. Anxiety and risk of incident coronary heart disease: a meta-analysis. *J Am Coll Cardiol*. 2010;56(1):38-46. [CrossRef]
39. Tully PJ, Harrison NJ, Cheung P, Cosh S. Anxiety and Cardiovascular Disease Risk: a Review. *Curr Cardiol Rep*. 2016;18(12):120. [CrossRef]
40. Polikandrioti M, Olympios C. Anxiety and coronary artery disease. *Arch Hellenic Med*. 2014;31(4):403-411.

41. Ginting H, van de Ven M, Becker ES, Näring G. Type D personality is associated with health behaviors and perceived social support in individuals with coronary heart disease. *J Health Psychol*. 2016;21(5):727-737. [CrossRef]
42. Yu XN, Chen Z, Zhang J, Liu X. Coping mediates the association between Type D personality and perceived health in Chinese patients with coronary heart disease. *Int J Behav Med*. 2011;18(3):277-284. [CrossRef]
43. Su SF, He CP. Type D Personality, Social Support, and Depression Among Ethnic Chinese Coronary Artery Disease Patients Undergoing a Percutaneous Coronary Intervention: An Exploratory Study. *Psychol Rep*. 2019;122(3):988-1006. [CrossRef]
44. Uchino BN, Carlisle M, Birmingham W, Vaughn AA. Social support and the reactivity hypothesis: conceptual issues in examining the efficacy of received support during acute psychological stress. *Biol Psychol*. 2011;86(2):137-142. [CrossRef]
45. Carney RM, Freedland KE. Depression and coronary heart disease. *Nat Rev Cardiol*. 2017;14(3):145-155. [CrossRef]
46. Al-Qezweny MN, Utens EM, Dulfer K, et al. The association between type D personality, and depression and anxiety ten years after PCI. *Neth Heart J*. 2016;24(9):538-543. [CrossRef]
47. Staniute M, Brozaitiene J, Burkauskas J, Kazukauskiene N, Mickuviene N, Bunevicius R. Type D personality, mental distress, social support and health-related quality of life in coronary artery disease patients with heart failure: a longitudinal observational study. *Health Qual Life Outcomes*. 2015;13:1. [CrossRef]

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A Bibliometric Analysis of Studies between 1980 and 2024 on Anxiety in Cardiac Surgery

1980-2024 Yılları Arasında Kalp Cerrahisinde Anksiyeteye İlişkin Çalışmaların Bibliyometrik Analizi

ABSTRACT

Objective: This study aimed to analyze articles related to cardiac surgery and anxiety using bibliometric approaches and techniques.

Method: This descriptive bibliometric study was conducted using the Web of Science database, covering the years 1980 to 2024. Relevant publications were identified using keywords such as "cardiac surgery," "heart surgery," "coronary artery bypass graft," "heart valve surgery," "coronary artery bypass," "cardiothoracic surgery," and "anxiety." Data were collected on December 17, 2024, and analyzed using VOSviewer 1.6.20 software to visualize research trends, collaborations, and keyword relationships.

Results: A total of 1,176 publications were included, comprising 1,034 research articles and 142 review papers. The volume of publications has increased significantly over time, peaking in 2022. The United States emerged as the leading contributor (n = 249), followed by Iran and Australia. The most prominent research areas were cardiovascular systems, cardiology, and nursing. The most frequently used keywords included "anxiety," "depression," and "cardiac surgery." Leading journals publishing in this field included Heart & Lung, Journal of Psychosomatic Research, and Journal of Clinical Nursing.

Conclusion: While anxiety in cardiac surgery has been a long-standing topic of study, it remains highly relevant. Nurses play a critical role in addressing anxiety in this context. Multidisciplinary interventional studies are recommended to advance the field further.

Keywords: Anxiety, bibliometric analysis, cardiac surgery, patient care, surgical outcomes

ÖZET

Amaç: Bu çalışmanın amacı, bibliyometrik yaklaşımlar ve teknikler kullanarak kalp cerrahisi ve anksiyete ile ilgili makaleleri analiz etmektir.

Yöntem: Araştırma, tanımlayıcı ve bibliyometrik bir türde olup, 1980-2024 yılları arasında Web of Science veritabanı kullanılarak yapılmıştır. İlgili yayınlar, "kardiyak cerrahi", "kalp cerrahisi", "koroner arter baypas grefti", "kalp kapak cerrahisi", "koroner arter baypas", "kardiyotorasik cerrahi" ve "anksiyete" anahtar kelimeleri kullanılarak taranmıştır. Kalp cerrahisinde anksiyete ile ilgili yayınlar seçilmiştir. Veriler 17 Aralık 2024 tarihinde toplanmıştır. Veri görselleştirme ve analizi için VOSviewer yazılımı kullanılmıştır.

Bulgular: İnceleme kapsamına 1.034 makale ve 142 derlemeden oluşan 1.176 yayın dahil edilmiştir. Analiz, zaman içinde yayınlarda belirgin bir artış olduğunu ve 2022 yılında zirveye ulaştığını göstermektedir. Amerika Birleşik Devletleri, önde gelen katkıda bulunan ülke (n = 249), ardından İran ve Avustralya gelmektedir. Birincil araştırma alanları kardiyovasküler sistemler, kardiyoloji ve hemşireliktir. "Anksiyete", "depresyon" ve "kalp cerrahisi" en sık kullanılan anahtar kelimelerdi. En iyi dergiler Heart & Lung, Journal of Psychosomatic Research ve Journal of Clinical Nursing'tir.

Sonuç: Kalp cerrahisinde anksiyete uzun süredir çalışılmasına rağmen, güncelliğini korumaktadır. Kalp cerrahisinde anksiyete konusunda hemşireler önemli katkılar sağlamaktadır. Multidisipliner girişimsel çalışmalar yapılması önerilmektedir.

Anahtar Kelimeler: Anksiyete, bibliyometrik analiz, kalp cerrahisi, hasta bakımı, cerrahi sonuçlar

ORIGINAL ARTICLE
KLİNİK ÇALIŞMA

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Introduction

Cardiac surgery is a procedure that imposes significant physical and psychological stress on both patients and caregivers.[1-3] The prevalence of anxiety among patients ranges

from 10% to 80%.[4-6] Anxiety experienced during the preoperative and postoperative periods is a critical factor that directly impacts surgical outcomes and recovery processes. Anxiety typically increases before surgery and decreases afterward; however, it has been reported to persist for up to six months in 20% of patients.[7] Anxiety has been shown to result in adverse outcomes in cardiac surgery. A study conducted in Türkiye indicated that high preoperative anxiety significantly impacted postoperative pain and led to poor sleep quality in 90% of patients.[8] Similarly, a prospective cohort study found that preoperative anxiety increased the need for postoperative analgesics in cardiac surgery patients.[9] In another study, preoperative anxiety and depression were associated with a higher incidence of postoperative delirium.[10] Therefore, understanding the effects of anxiety on the surgical process and developing evidence-based approaches to manage it is of great importance.

Several studies have investigated the factors affecting anxiety in cardiac surgery patients. A key finding from one study was that preoperative anxiety levels were higher in female patients compared to male patients, and the presence of family support did not significantly influence this anxiety.[11] Another study revealed that preoperative optimism was associated with lower levels of postoperative anxiety.[12] Various pharmacological and non-pharmacological methods have proven effective in reducing anxiety. One study reported that clonidine and gabapentin were effective in reducing anxiety but did not significantly affect cardiac outcomes.[4] Music therapy,[13] acupressure,[14] and perioperative psychological interventions[15] have been identified as effective methods for reducing anxiety. Additionally, preoperative education and hospital visits have been highlighted in the literature as effective means of alleviating anxiety before surgery.[6,16,17]

The increase in the number of studies on anxiety makes it necessary to determine the general trends in the literature and identify research gaps. At this point, bibliometric analysis is an important research tool that quantitatively evaluates scientific publications and helps to understand the general structure of the field.[18-20] Bibliometric analysis is a research method that quantitatively evaluates scientific publications. This approach uses mathematical and statistical techniques to map the structure of research fields, identify knowledge gaps, and generate new research ideas.[21-23] Performance analysis assesses the contributions of authors, organizations, and countries based on metrics such as publication and citation counts. At the same time, scientific mapping explores relationships between research components such as authors and keywords.[22,24,25] Bibliometric analysis has been demonstrated to facilitate progress in the applied sciences, particularly in identifying research priorities, recognizing knowledge gaps, and comprehending general disciplinary trends.[20,24,26] In recent years, bibliometric studies have been published in prominent journals related to nursing, covering a wide variety of topics, including diabetic foot nursing care, patient safety and surveillance, delirium, and the prevention of inpatient falls.[25,27-31] To conduct such analyses with reliable data, it is necessary to use a comprehensive, high-quality, and internationally recognized data source. In this context, the Web of Science database is preferred because of its comprehensive citation indexes, interdisciplinary coverage, and the ability to analyze relationships between scientific publications in detail. This study aims to comprehensively evaluate the literature, identify the main trends, and reveal research gaps using the Web of Science database for bibliometric analysis of cardiac surgery and anxiety articles. Bibliometric analysis of cardiac surgery and anxiety studies is crucial for comprehensively evaluating the literature in this field, identifying the main trends, and revealing research gaps. This study aims to analyze articles on cardiac surgery and anxiety using bibliometric methodology.

MAIN POINTS

- The bibliometric analysis of 1,176 publications from 1980 to 2024 revealed that the highest number of publications occurred in 2022. Nursing emerged as the second most important field of research.
- The most significant keywords identified were "cardiac anxiety," "depression," "cardiac surgery," "quality of life," and "pain."
- The top three journals with the highest number of publications and citations in the field of anxiety in cardiac surgery were nursing journals.

Materials and Methods

This study used a bibliometric, descriptive research design.[18,19,32,33] The research questions were as follows:

- What is the annual publication trend between 1980 and 2024?
- Which disciplines (e.g., cardiology, nursing, internal medicine) have the most publications?
- Who are the most cited authors, and what are their publications on anxiety in cardiac surgery?
- What are the most frequently used key terms in publications on anxiety in cardiac surgery?
- Which journals have contributed studies on anxiety in cardiac surgery?

Web of Science was selected as the database for this research. The Web of Science database provides broad access to an interdisciplinary and comprehensive scientific data network, including high-quality, reliable publications.[20,34]

Data were collected on December 17, 2024. The dataset was generated by searching the Web of Science database using keywords related to cardiac surgery, including "cardiac surgery," "heart surgery," "coronary artery bypass graft," "heart valve surgery," "coronary artery bypass," and "cardiothoracic surgery." To capture studies addressing anxiety, the keyword "anxiety" was also included. Studies focusing on anxiety in cardiac surgery were selected based on their relevance to the topic and keyword criteria. The dataset includes studies published between 1980 and 2024, with the oldest publication from 1980 and the most recent from 2024. In total, 1,176 publications were identified, consisting of 142 review articles and 1,034 research articles.

The VOSviewer 1.6.20 software package was used during the analysis phase, as it allows direct processing of Web of Science data to produce visual outputs and graphical representations.

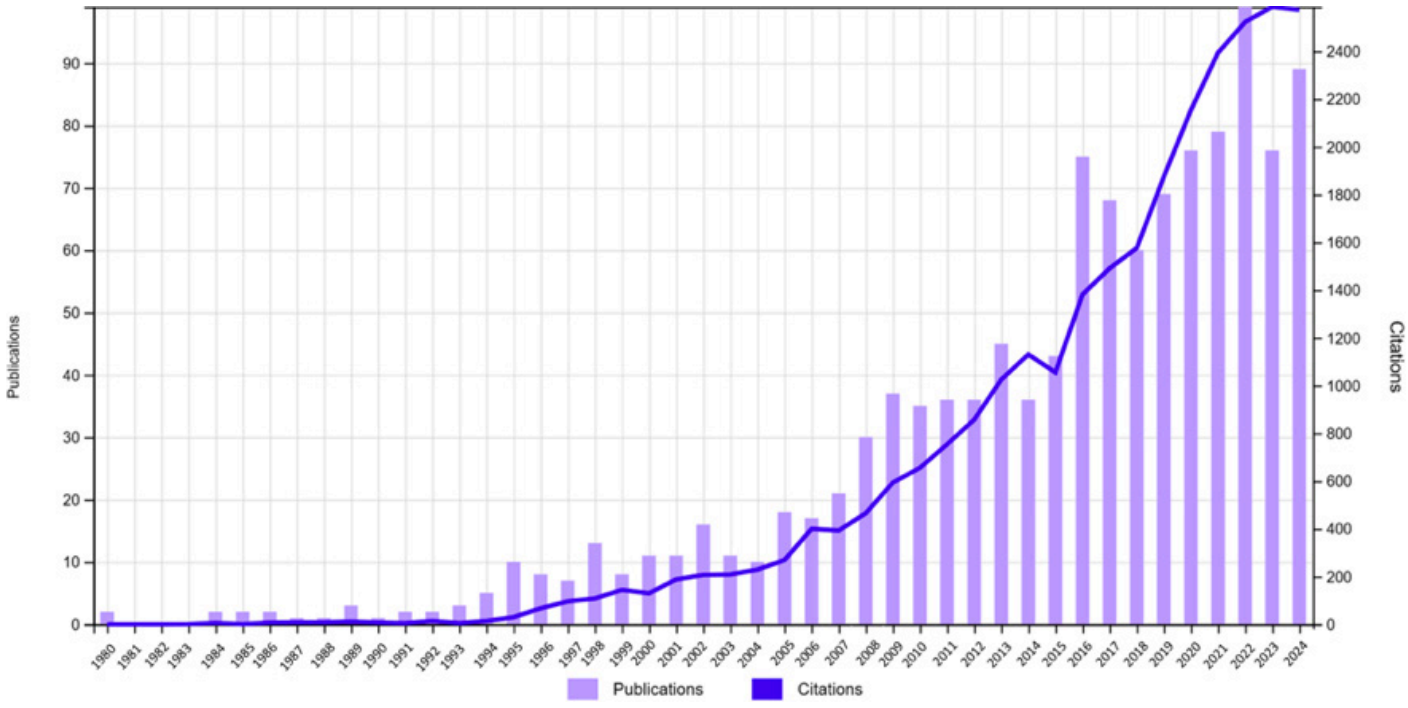

Figure 1. Number of publications and citations by year (1980-2024).

VOSviewer was chosen due to its strong functionality and ability to facilitate the exploration of developments, relationships, and emerging concepts in the literature. Widely recognized as an essential tool for bibliometric research, VOSviewer offers advanced features for visualization, mapping, and multidimensional analysis, enabling detailed examination of datasets.[24, 25, 28, 34]

Ethics

Ethics committee approval was not required, as the study was a bibliometric analysis using the Web of Science database.

Results

Between 1980 and 2024, a total of 1,176 studies on anxiety in cardiac surgery patients were published. Of these, 1,034 (87.92%) were research articles, and 142 (12.08%) were review articles. An increase in the number of publications on cardiac surgery and anxiety over the years was observed. The highest number of studies was published in 2022 (n = 99), while the year with the most citations was 2023, with 2,583 citations. Excluding self-citations, the total number of citations for the 1,176 studies was 18,575, with these citations appearing in 23,896 articles. The average number of citations per study was 23.54 (Figure 1).

When research areas were analyzed, "cardiovascular systems and cardiology" ranked first with 321 publications, followed by "nursing" with 244 (20.74%) publications and "general internal medicine" with 154 (13.09%) publications (Figure 2).

The top ten contributors to research on anxiety in cardiac surgery were: Tully P. (n = 16), Baker RA (n = 14), Berg SK (n = 10), Ai AL (n = 10), Murphy BM (n = 9), Le Grande MR (n = 9), Medoff-Cooper B (n = 8), Steptoe A (n = 8), Arora RC (n = 8), and Jahangiri M (n = 7). The 10 most-cited studies and their first authors in cardiac surgery and anxiety are listed in Table 1. According to the most recent bibliometric analysis, Kalkman et al. in 2003[35] had received 411 citations, Druss et al. in 2000[36] had received 407 citations, Arthur et al. in 2000[37] had received 328 citations, Carli et al. in 2010[38] had received 324 citations, Rosenberger et al. in 2006[39] had received 279 citations, Brander et al. in 2007[40] received 262 citations, Karsdorp et al. in 2007[41] received 253 citations, Treggiari et al. in 2009[42] received 248 citations, Clark et al. in 1995[43] received 242 citations, and Tedstone et al. in 2003[44] received 228 citations.

The primary languages of publication were English (95.40%; n = 1,122), German (1.78%; n = 21), Portuguese (0.76%; n = 9), Spanish (0.42%; n = 5), and Turkish (0.34%; n = 4). Researchers from 79 different countries contributed studies on anxiety in cardiac surgery. The countries with the most significant contributions were the United States (n = 249, citations = 8,428), Iran (n = 94, citations = 1,001), Australia (n = 89, citations = 3,224), Canada (n = 89, citations = 2,942), China (n = 87, citations = 1,176), the United Kingdom (n = 86, citations = 2,840), Germany (n = 85, citations = 2,159), Türkiye (n = 75, citations = 705), the Netherlands (n = 51, citations = 2,141), and Italy (n = 50, citations = 611).

When examining the organizations contributing to the research, 1,561 organizations were identified. The top 10 organizations were: University of Melbourne (n = 23), Flinders University of South Australia (n = 19), Université de Montréal (n = 17), University of Toronto (n = 16), University of Adelaide (n = 16), Monash University (n = 15), Flinders Medical Centre (n = 13), University College London (n = 13), Copenhagen University Hospital (n = 13), and University of Tehran Medical Sciences (n = 13) (Figure 3).

Table 1. Top ten most cited publications and authors

	Author(s)	Title	Year	Journal name	Total citations
1	Kalkman et al.[35]	Preoperative prediction of severe postoperative pain	2003	*Pain*	411
2	Druss et al.[36]	Mental disorders and use of cardiovascular procedures after myocardial infarction	2000	*JAMA-Journal of the American Medical Association*	407
3	Arthur et al.[37]	Effect of a preoperative intervention on preoperative and postoperative outcomes in low-risk patients awaiting elective coronary artery bypass graft surgery – A randomized, controlled trial	2000	*Annals of Internal Medicine*	328
4	Carli et al.[38]	Randomized clinical trial of prehabilitation in colorectal surgery	2010	*British Journal of Surgery*	324
5	Rosenberger et al.[39]	Psychosocial factors and surgical outcomes: An evidence-based literature review	2006	*Journal of the American Academy of Orthopaedic Surgeons*	279
6	Brander et al.[40]	Pain and depression influence outcome 5 years after knee replacement surgery	2007	*Clinical Orthopaedics and Related Research*	262
7	Karsdorp et al.[41]	Psychological and cognitive functioning in children and adolescents with congenital heart disease: A meta-analysis	2007	*Journal of Pediatric Psychology*	253
8	Treggiari et al.[42]	Randomized trial of light versus deep sedation on mental health after critical illness	2009	*Critical Care Medicine*	248
9	Clark et al.[43]	Microemboli during coronary artery bypass grafting – Genesis and effect on outcome	1995	*Journal of Thoracic and Cardiovascular Surgery*	242
10	Tedstone et al.[44]	Posttraumatic stress disorder following medical illness and treatment	2003	*Clinical Psychology Review*	228

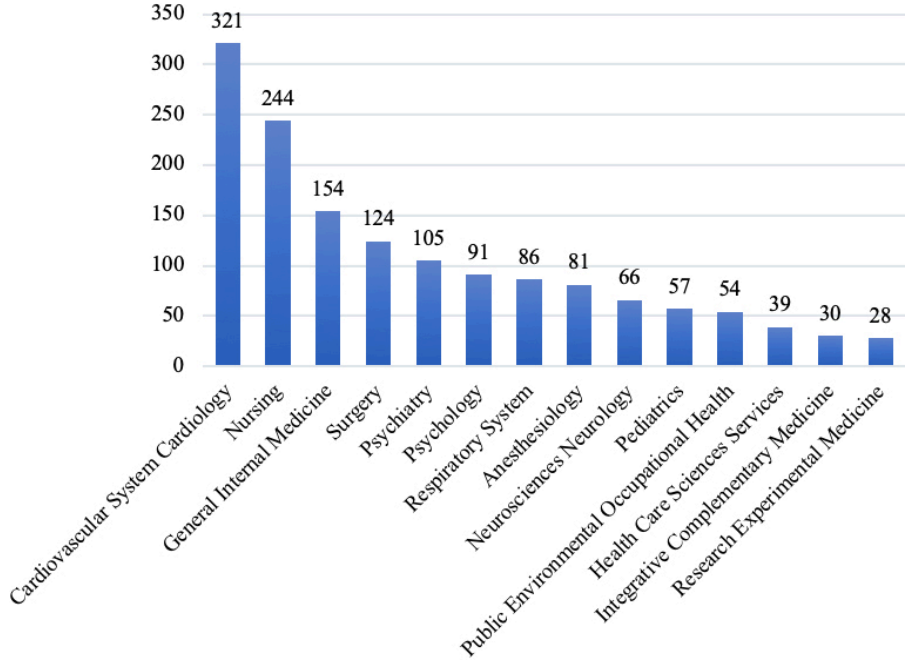

Figure 2. Investigation of research areas by year (1980-2024).

The journals with the highest number of publications and citations in the field of anxiety in cardiac surgery were: Heart & Lung (n = 28, 1,150 citations), followed by Journal of Psychosomatic Research (n = 20, 880 citations), Journal of Clinical Nursing (n = 20, 569 citations), Cardiology in the Young (n = 19, 400 citations), Journal of Cardiovascular Nursing (n = 18, 352 citations), European Journal of Cardiovascular Nursing (n = 16, 334 citations), Psychology, Health & Medicine (n = 14, 326 citations), BMJ Open (n = 12, 178 citations), Journal of Thoracic and Cardiovascular Surgery (n = 12, 617 citations), and Journal of Advanced Nursing (n = 11, 386 citations). Other journal names are shown in Figure 4.

A total of 1,957 keywords were identified in the publications on anxiety in cardiac surgery. The most frequently used keywords were "anxiety" (n = 318), "depression" (n = 219), "cardiac surgery" (n = 186), "quality of life" (n = 71), "pain" (n = 56), "congenital

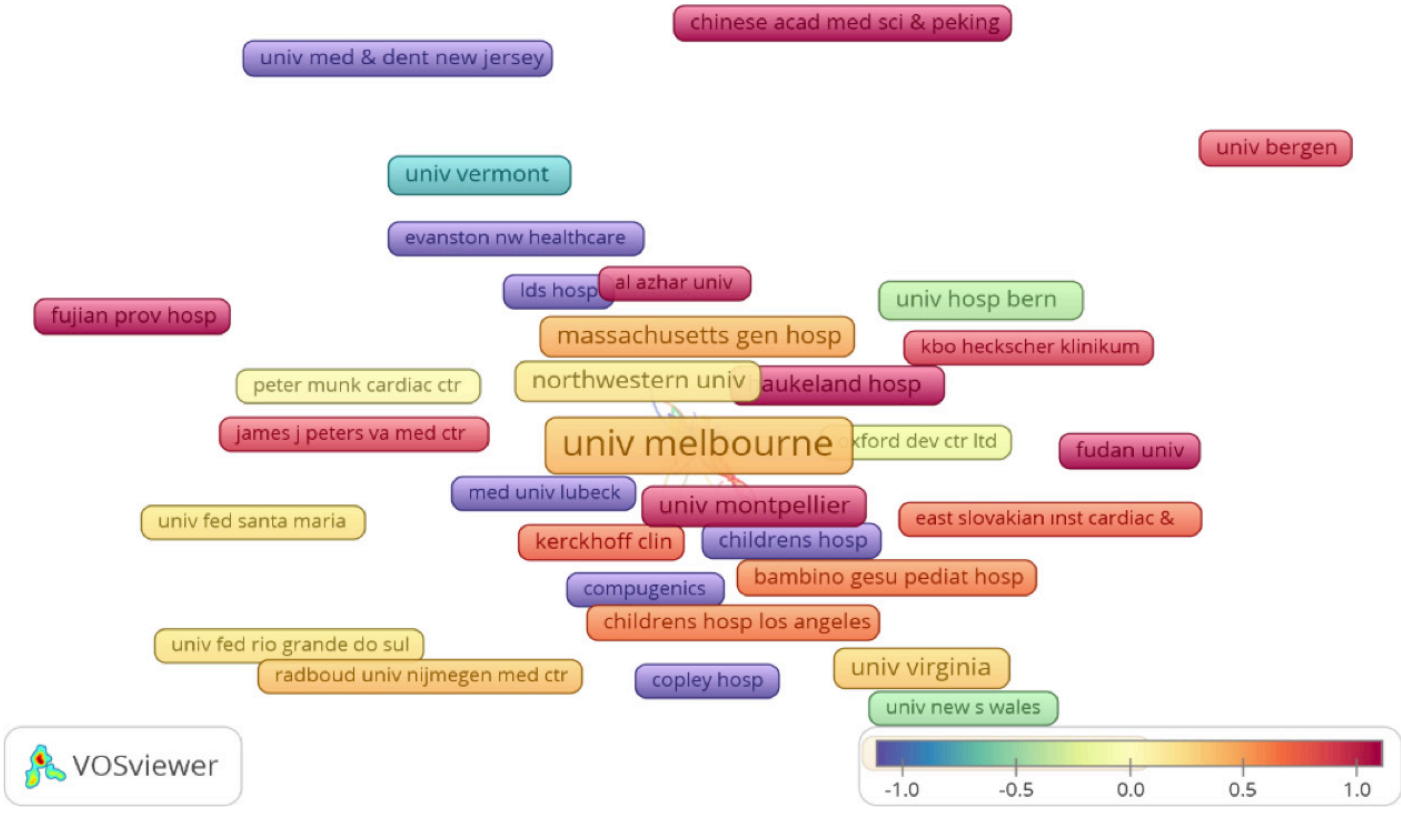

Figure 3. Institutions contributing to the literature.

heart disease" (n = 46), "delirium" (n = 45), "coronary artery bypass graft surgery" (n = 45), "surgery" (n = 42), "coronary artery bypass graft" (n = 39), "nursing" (n = 37), "cardiac rehabilitation" (n = 36), "stress" (n = 34), "coronary artery bypass" (n = 31), "coronary artery bypass grafting" (n = 31), "coronary heart disease" (n = 28), "CABG" (n = 27), "coronary artery disease" (n = 25), "patient education" (n = 21), "risk factors" (n = 19), "cardiac surgical procedures" (n = 18), "thoracic surgery" (n = 18), "open-heart surgery" (n = 18), "postoperative pain" (n = 18), "systematic review" (n = 17), "meta-analysis" (n = 16), "randomized controlled trial" (n = 15), "preoperative anxiety" (n = 15), "mental health" (n = 14), "critical care" (n = 14), "cardiovascular disease" (n = 14), "rehabilitation" (n = 14), "parents" (n = 13), "self-efficacy" (n = 13), "mortality" (n = 13), "cortisol" (n = 12), "postoperative delirium" (n = 12), "coping" (n = 12), and "music" (n = 12). These keywords and their clusters are shown in Figure 5.

The journals included in the bibliography of studies on cardiac surgery and anxiety were as follows: Journal of Psychosomatic Research (n = 20, 880 citations), European Journal of Cardiovascular Nursing (n = 16, 334 citations), Heart & Lung (n = 28, 1,150 citations), Journal of Behavioral Medicine (n = 9, 285 citations), Journal of Cardiovascular Nursing (n = 18, 352 citations), Journal of Clinical Nursing (n = 20, 569 citations), Psychology, Health & Medicine (n = 14, 326 citations), BMJ Open (n = 12, 178 citations), International Journal of Cardiology (n = 10, 389 citations), Cochrane Database of Systematic Reviews (n = 3, 320 citations), Journal of Thoracic and Cardiovascular Surgery (n = 12, 617 citations), Journal of Advanced Nursing (n = 11, 386 citations), Journal of Perianesthesia Nursing (n = 8, 110 citations), Annals of Thoracic Surgery (n = 9, 408 citations), British Journal of Health Psychology (n = 5, 97 citations), Psychosomatic Medicine (n = 5, 360 citations), PLOS One (n = 6, 165 citations), Journal of Health Psychology (n = 6, 181 citations), International Journal of Nursing Studies (n = 7, 353 citations), and Journal of Geriatric Cardiology (n = 2, 203 citations).

Discussion

This study examined the literature on cardiac surgery and anxiety from 1980 to 2024, focusing on publication trends, keyword distributions, and contributions from countries and organizations. The majority of publications and citations in this field occurred in 2022 and 2023, respectively. These findings highlight that anxiety continues to be a significant issue in cardiac surgery. The ongoing interest in this topic reflects that anxiety remains a critical focus for researchers, and current interventional studies indicate that solutions are actively being sought.[13,45-48]

A review of research areas revealed that "cardiovascular systems and cardiology" (321 publications), "nursing" (244 publications, 20.74%), and "general internal medicine" (154 publications, 13.09%) were the top three fields. These results underscore the multidisciplinary nature of the topic, with contributions spanning various healthcare disciplines. Nursing, in particular, plays a significant role in this area of research, as nurses are directly involved in patient care both before and after surgery, providing critical support to reduce anxiety. Patient education, emotional support, and addressing psychological needs are essential components of nursing care. The analysis of journals

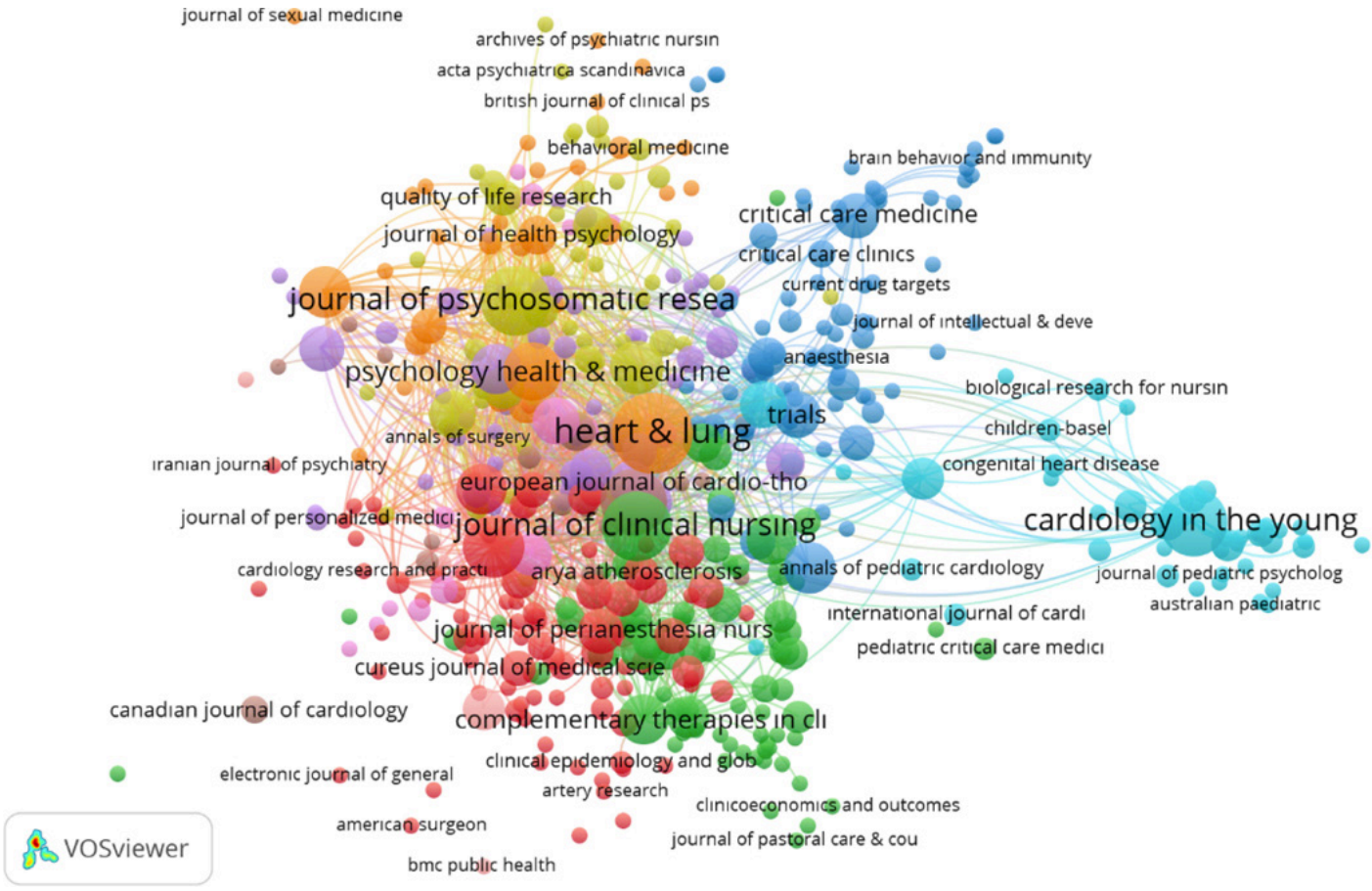

Figure 4. Most published and cited journal clusters in the field of anxiety in cardiac surgery.

with the highest number of publications and citations in the field reveals that high-impact nursing journals, such as Heart & Lung and the Journal of Clinical Nursing, are among the top three. This finding further validates the essential role of nurses in managing anxiety in cardiac surgery patients.

The study also analyzed the geographical distribution of research on anxiety in cardiac surgery, identifying contributions from 79 countries. The United States led with 249 publications and 8,428 citations, followed by Iran, Australia, Canada, China, the United Kingdom, Germany, Türkiye, the Netherlands, and Italy. These results emphasize the global interest in the topic and the importance of international collaboration. The United States' leading position in both publication volume and citation count can be attributed to its strong academic infrastructure and interdisciplinary collaboration mechanisms. Many clinical trials in this field have been conducted in the U.S., reflecting its leadership in cardiovascular medicine and nursing. Iran, Australia, and Canada have also made significant contributions, with high citation rates. Türkiye, with 75 publications and 705 citations, shows potential for increased interdisciplinary research and greater focus on publishing in high-impact journals.

An analysis of the 1,957 keywords used in publications on anxiety in cardiac surgery revealed that the most frequently used terms were "anxiety" (318), "depression" (219), and "cardiac surgery" (186). These findings highlight that psychosocial factors and the effects of surgical procedures on patients are central to this body of research. Other prominent keywords, including "nursing" (37), "quality of life" (71), and "pain" (56), reinforce the critical role of nursing in patient care. Nurses contribute significantly to patient education, psychosocial support, and pain management, emphasizing the importance of patient-centered approaches in this area of research.[16,46,49] Keywords related to surgical procedures, such as "coronary artery bypass graft surgery," "postoperative pain," and "open-heart surgery," were also frequently mentioned. These terms suggest that research often focuses on surgical techniques, complications, and their management, reinforcing the need for multidisciplinary approaches to anxiety in cardiac surgery.[2,16,45] Keywords reflecting psychosocial and biological processes, such as "stress," "cortisol," and "self-efficacy," highlight the importance of understanding the impact of anxiety on patients. Studies examining stress and cortisol responses are particularly valuable for gaining insight into the comprehensive effects of surgery on patients. Additionally, the keyword "music" reflects a growing interest in alternative interventions to improve patient experiences during postoperative recovery.[13,48]

Limitations

This study's analyses were conducted exclusively using the Web of Science database. The exclusion of other significant sources, such as Scopus, YOK Thesis Center, and TR Index, limited the

Figure 5. Keywords used in the field of anxiety in cardiac surgery and their clustering.

scope of the analysis and excluded potential findings from these databases. This represents a limitation of the study.

Conclusion

This study examines the prevalence and impact of anxiety in patients undergoing cardiac surgery using data from the Web of Science database between 1980 and 2024. Bibliometric analyses in this field reveal a significant increase in research on the prevalence and management of anxiety in recent years. Nursing journals dominate the field, with the highest number of publications and citations related to anxiety in cardiac surgery. Keyword analysis indicates that the most frequently studied topics include the risk factors for anxiety and its management strategies, with a particular emphasis on nursing interventions such as education and psychological support. Recent keyword trends also highlight a growing interest in innovative approaches, such as digital therapies, for managing anxiety.[49-53] These innovations should be further explored through comprehensive meta-analyses and international comparisons to develop more effective strategies. It is recommended that international and multidisciplinary research be conducted to investigate the use of innovative methods in managing anxiety among cardiac surgery patients.

Ethics Committee Approval: Ethics committee approval was not required, as the study was a bibliometric analysis using the Web of Science database.

Informed Consent: Written informed consent was not required.

Conflict of Interest: The author declared no potential conflicts of interest concerning this article's research, authorship, and/or publication.

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Use of AI for Writing Assistance: No artificial intelligence (AI)-enabled technologies (such as Large Language Models [LLM], chatbots, or image generators) were used in the creation of this study.

Peer-review: Externally peer-reviewed.

References

1. Açıkel MET. Evaluation of Depression and Anxiety in Coronary Artery Bypass Surgery Patients: A Prospective Clinical Study. *Braz J Cardiovasc Surg*. 2019;34(4):389-395. [CrossRef]
2. Dolapoglu N, Dolapoglu A, Altunöz S. Caregiver burden, family adaptation, partnership, growth, affection, and resolve, anxiety levels, and perceived social support in relatives of patients with open heart surgery. *Rev Assoc Med Bras (1992)*. 2024;70(2):e20230494. [CrossRef]
3. Bozdag F, Basdas F. Anxiety and depression levels of mothers in pediatric cardiac intensive care units. *Turk J Card Nur*. 2023;14(33)1-7. [CrossRef]

4. Mudgalkar N, Kandi V, Baviskar A, Kasturi RR, Bandurapalli B. Preoperative anxiety among cardiac surgery patients and its impact on major adverse cardiac events and mortality- A randomized, parallel-group study. *Ann Card Anaesth*. 2022;25(3):293-296. [CrossRef]
5. Gonçalves KK, Silva JI, Gomes ET, Pinheiro LL, Figueiredo TR, Bezerra SM. Anxiety in the preoperative period of heart surgery. *Rev Bras Enferm*. 2016;69(2):397-403. English, Portuguese. [CrossRef]
6. Prado-Olivares J, Chover-Sierra E. Preoperatory Anxiety in Patients Undergoing Cardiac Surgery. *Diseases*. 2019;7(2):46. [CrossRef]
7. Hoyer J, Eifert GH, Einsle F, et al. Heart-focused anxiety before and after cardiac surgery. *J Psychosom Res*. 2008;64(3):291-297. [CrossRef]
8. Kankaya E, Bilik O. Three enemies of circadian rhythm: anxiety, pain, and sleep quality after open heart surgery. *Clin Exp Health Sci*. 2019;9(3)246-252. [CrossRef]
9. Fernández-Castro M, Jiménez JM, Martín-Gil B, et al. The influence of preoperative anxiety on postoperative pain in patients undergoing cardiac surgery. *Sci Rep*. 2022;12(1):16464. [CrossRef]
10. Pakrad F, Pakrad E, Darvishi N, Poorolajal J. Preoperative Anxiety and Depression Increases the Incidence of Delirium After Coronary Artery Bypass Graft Surgery. *J Perianesth Nurs*. 2020;35(5):496-501. [CrossRef]
11. Fathi M, Alavi SM, Joudi M, et al. Preoperative anxiety in candidates for heart surgery. *Iran J Psychiatry Behav Sci*. 2014;8(2):90-96.
12. Ai AL, McMullen CA, Smyth SS. Preoperative Optimism Related to Low Anxiety in Patients 1 Month After Open Heart Surgery. *J Nerv Ment Dis*. 2020;208(12):966-973. [CrossRef]
13. Kakar E, Billar RJ, van Rosmalen J, Klimek M, Takkenberg JJM, Jeekel J. Music intervention to relieve anxiety and pain in adults undergoing cardiac surgery: a systematic review and meta-analysis. *Open Heart*. 2021;8(1):e001474. [CrossRef]
14. Khoram B, Yoosefinejad AK, Rivaz M, Najafi SS. Investigating the Effect of Acupressure on the Patients' Anxiety Before Open-Heart Surgery: A Randomized Clinical Trial. *J Acupunct Meridian Stud*. 2020;13(6):169-173. [CrossRef]
15. Tigges-Limmer K, Sitzer M, Gummert J. Perioperative Psychological Interventions in Heart Surgery-Opportunities and Clinical Benefit. *Dtsch Arztebl Int*. 2021;118(19):339-345. [CrossRef]
16. Guo P. Preoperative education interventions to reduce anxiety and improve recovery among cardiac surgery patients: a review of randomised controlled trials. *J Clin Nurs*. 2015;24(1-2):34-46. [CrossRef]
17. Kalogianni A, Almpani P, Vastardis L, Baltopoulos G, Charitos C, Brokalaki H. Can nurse-led preoperative education reduce anxiety and postoperative complications of patients undergoing cardiac surgery? *Eur J Cardiovasc Nurs*. 2016;15(6):447-458. [CrossRef]
18. Ozkan E. Intensive care unit carbon footprint: A bibliometric and document content analysis. *Nurs Crit Care*. 2025;30(1):11-18. [CrossRef]
19. Turhan Damar H, Öğce Aktaş UF. Bibliometric analysis of studies on surgical site infections in nursing (2000-2022). *Gevher Nesibe J Med Health Sci*. 2022;7(20):111-120.
20. Zhu R, Liu M, Su Y, Meng X, Han S, Duan Z. A bibliometric analysis of publication of funded studies in nursing research from Web of Science, 2008-2018. *J Adv Nurs*. 2021;77(1):176-188. [CrossRef]
21. Çiçek Korkmaz A. Trends and current topics in artificial intelligence in nursing research: A bibliometric analysis and science mapping. *Balikesir Health Sci J*. 2024;13(2):324-338. [CrossRef]
22. Mezquita B, Alfonso-Arias C, Martínez-Jaimez P, Borrego Á. The use of bibliometrics in nursing science: Topics, data sources and contributions to research and practice. *Nurs Open*. 2024;11(9):e70036. [CrossRef]
23. McBurney MK, Novak PL. What is bibliometrics and why should you care? Paper presented at: Professional Communication Conference, 2002. IPCC 2002. Proceedings. IEEE International; September 20; 2022; Portland, OR, USA. Accessed September 23, 2025. https://ieeexplore.ieee.org/document/1049094
24. Dirik D, Eryılmaz İ, Erhan T. A Bibliometric Analysis using VOSviewer of Publications on Post-Truth. *Sosyal Mucit Academic Review*. 2023;4(2):164-188. [CrossRef]
25. Zhao Y, Jing L, Ma X, et al. Trends and prospects in nursing care for diabetic foot: A bibliometric analysis from 2003 to 2023. *J Tissue Viability*. 2024;33(4):550-560. [CrossRef]
26. Kokol P, Blažun Vošner H. Historical, descriptive and exploratory analysis of application of bibliometrics in nursing research. *Nurs Outlook*. 2019;67(6):680-695. [CrossRef]
27. Doyon O, Raymond L. Surveillance and patient safety in nursing research: A bibliometric analysis from 1993 to 2023. J Adv Nurs. 2024;80(2):777-788. [CrossRef]
28. Azizoğlu F, Terzi B. Research topics on pressure injury prevention and measurement tools from 1997 to 2023: A bibliometric analysis using VOSviewer. *Intensive Crit Care Nurs*. 2024;80:103557. [CrossRef]
29. Cho I, Kim D, Park H. Bibliometrics and Co-Citation Network Analysis of Systematic Reviews of Evidence-Based Nursing Guidelines for Preventing Inpatient Falls. *Comput Inform Nurs*. 2021;40(2):95-103. [CrossRef]
30. Ergul S, Ardahan M, Temel AB, Yildirim BO. Bibliometric review of references of nursing research papers during the decade 1994-2003 in Turkey. *Int Nurs Rev*. 2010;57(1):49-55. [CrossRef]
31. Hancı V, Damar HT, Damar M. Bibliometric analysis of studies on delirium in critical care. *DCCN*. 2024;43(6):291-297. [CrossRef]
32. Korkmaz EK, Ateş E. Standardized patient simulation in nursing education: A bibliometric analysis and visualization from 2002 to 2024. *Nurse Educ Pract*. 2025;84:104322. [CrossRef]
33. Özkan E, Sürmeli Ş. Bibliometric analysis and science mapping of surgical site infection: A descriptive study. *Turkiye Klinikleri J Nurs Sci*. 2023;15(3):584-592. Turkish. [CrossRef]
34. Yesilbas H, Kantek F, Aytur Ozen T. Knowledge development of empowerment in nursing research: A bibliometric analysis using reference publication year spectroscopy. *Jpn J Nurs Sci*. 2025;22(1):e12640. [CrossRef]
35. Kalkman JC, Visser K, Moen J, Bonsel JG, Grobbee ED, Moons MKG. Preoperative prediction of severe postoperative pain. *Pain*. 2003;105(3):415-423. [CrossRef]
36. Druss BG, Bradford DW, Rosenheck RA, Radford MJ, Krumholz HM. Mental disorders and use of cardiovascular procedures after myocardial infarction. *JAMA*. 2000;283(4):506-511. [CrossRef]
37. Arthur HM, Daniels C, McKelvie R, Hirsh J, Rush B. Effect of a preoperative intervention on preoperative and postoperative outcomes in low-risk patients awaiting elective coronary artery bypass graft surgery. A randomized, controlled trial. *Ann Intern Med*. 2000;133(4):253-262. [CrossRef]
38. Carli F, Charlebois P, Stein B, et al. Randomized clinical trial of prehabilitation in colorectal surgery. *Br J Surg*. 2010;97(8):1187-1197. [CrossRef]
39. Rosenberger PH, Jokl P, Ickovics J. Psychosocial factors and surgical outcomes: an evidence-based literature review. *J Am Acad Orthop Surg*. 2006;14(7):397-405. [CrossRef]
40. Brander V, Gondek S, Martin E, Stulberg SD. Pain and depression influence outcome 5 years after knee replacement surgery. *Clin Orthop Relat Res*. 2007;464:21-26. [CrossRef]
41. Karsdorp PA, Everaerd W, Kindt M, Mulder BJ. Psychological and cognitive functioning in children and adolescents with congenital heart disease: a meta-analysis. *J Pediatr Psychol*. 2007;32(5):527-541. [CrossRef]
42. Treggiari MM, Romand JA, Yanez ND, et al. Randomized trial of light versus deep sedation on mental health after critical illness. *Crit Care Med*. 2009;37(9):2527-2534. [CrossRef]
43. Clark RE, Brillman J, Davis DA, Lovell MR, Price TR, Magovern GJ. Microemboli during coronary artery bypass grafting. Genesis and effect on outcome. *J Thorac Cardiovasc Surg*. 1995;109(2):249-257; discussion 257-258. [CrossRef]
44. Tedstone JE, Tarrier N. Posttraumatic stress disorder following medical illness and treatment. *Clin Psychol Rev*. 2003;23(3):409-448. [CrossRef]

45. Gomes ET, Püschel VAA. Effectiveness of Reiki therapy for preoperative anxiety in cardiac surgery: a randomized clinical trial. *Acta Paul Enferm*. 2024;37:eAPE00082. [CrossRef]
46. Dağcan Şahin N, Gürol Arslan G. The effect of an open-heart surgery patient care protocol on post-sternotomy pain, anxiety and quality of care: A randomized controlled trial. *Nurs Crit Care*. 2025;30(3):e13193. [CrossRef]
47. Li T, Guo Y, Lyu D, et al. The effectiveness of music in improving the recovery of cardiothoracic surgery: a systematic review with meta-analysis and trial sequential analysis. *BMC Anesthesiol*. 2024;24(1):339. [CrossRef]
48. Kavak Akelma F, Altınsoy S, Arslan MT, Ergil J. Effect of favorite music on postoperative anxiety and pain. *Anaesthesist*. 2020;69(3):198-204. English. [CrossRef]
49. Jeon JY, Kim DH, Kang K. Effect of audiovisual media-based nursing information on environmental stress, anxiety, and uncertainty in patients undergoing open-heart surgery. *Medicine (Baltimore)*. 2023;102(8):e33001. [CrossRef]
50. Pillay SS, Croghan IT, Bauer BA. Mitigating Preoperative Anxiety in Cardiac Surgery Patients Through Virtual Reality: A Novel Approach. *Mayo Clin Proc*. 2025;100(2):184-186. [CrossRef]
51. Kondylakis H, Giglioli IAC, Katehakis D, et al. Stress Reduction in Perioperative Care: Feasibility Randomized Controlled Trial. *J Med Internet Res*. 2025;27:e54049. Erratum in: *J Med Internet Res*. 2025;27:e73608. [CrossRef]
52. Humphries SM, Wallert J, Norlund F, et al. Internet-Based Cognitive Behavioral Therapy for Patients Reporting Symptoms of Anxiety and Depression After Myocardial Infarction: U-CARE Heart Randomized Controlled Trial Twelve-Month Follow-up. *J Med Internet Res*. 2021;23(5):e25465. [CrossRef]
53. Awaludin S, Nurachmah E, Soetisna TW, Umar J. The effect of a smartphone-based perioperative nursing intervention: prayer, education, exercise therapy, hypnosis, and music toward pain, anxiety, and early mobilization on cardiac surgery. *J Public Health Res*. 2021;11(2):2742. [CrossRef]

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