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

Büşra Dalfidan Sayın

Gülay Oyur Çelik

Sinem Eskidemir

Department of Surgical Nursing, İzmir Katip Çelebi University Faculty of Health Sciences, İzmir, Türkiye

Corresponding author:
Gülay Oyur Çelik
✉ gulayoyur@gmail.com

Received: April 29, 2025
Accepted: June 19, 2025

Cite this article as: Dalfidan Sayın B, Oyur Çelik G, Eskidemir S. Quality of Life and Influencing Factors in Elderly Cardiac Surgery Patients: A Systematic Review. *Turk J Cardiovasc Nurs.* 2025;16(41):119-125.

DOI: 10.5543/khd.2025.38981

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.

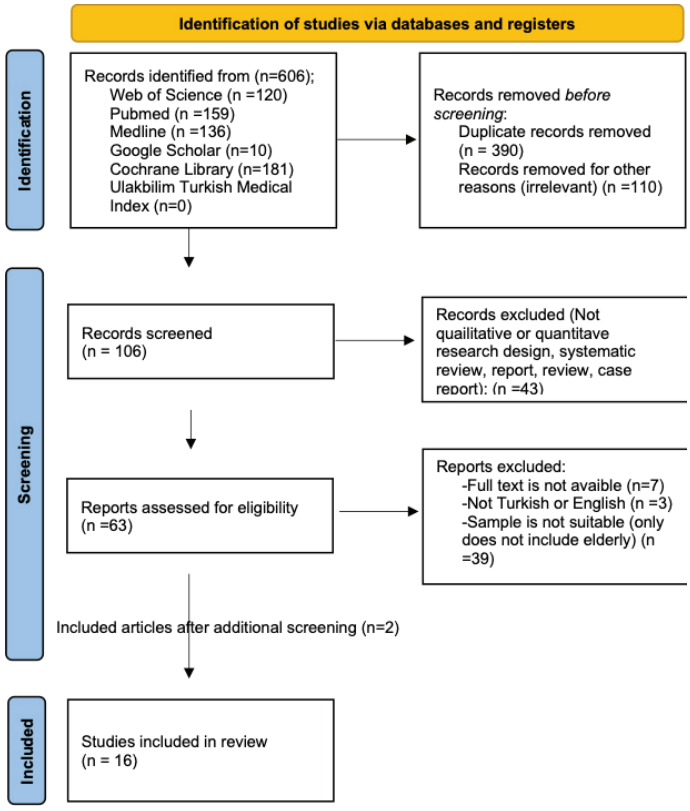

Figure 1. PRISMA flow diagram.

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.

Ethics Committee Approval: Ethics committee approval was not required.

Informed Consent: Written informed consent was not required.

Conflict of Interest: The authors have no conflicts of interest to declare.

Funding: The authors declared that this study received no financial support.

Use of AI for Writing Assistance: The authors declare no AI-assisted tools were used in the article.

Author Contributions: Concept – B.D.S., G.O.Ç., S.E.; Design – B.D.S., G.O.Ç., S.E.; Supervision – B.D.S., G.O.Ç., S.E.; Resource – B.D.S., G.O.Ç., S.E.; Data Collection and/or Processing – B.D.S., S.E.; Analysis and/or Interpretation – B.D.S., G.O.Ç., S.E.; Literature Review – B.D.S., G.O.Ç., S.E.; Writing – B.D.S., G.O.Ç., S.E.; Critical Review – B.D.S., G.O.Ç., S.E.

Peer-review: Externally peer-reviewed.

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.