IMPROVING QUALITY OF LIFE POST KIDNEY TRANSPLANTATION: INSIGHTS FROM A SYSTEMATIC REVIEW IN ASIAN RECIPIENTS

[1] Alviano Satria Wibawa, [1]Muhammad Bagus Fidiandra, [1]Nurizzah F. Sofia, [2]Zulfikar Dian Paradilan.

[1] Abdoer Raheem General Hospital, Situbondo, Indonesia.
[2] Department of Urology, Abdoer Raheem General Hospital, Situbondo, Indonesia.

ABSTRACT

Introduction: *Kidney transplantation (KT) offers significant benefits regarding its effectiveness in improving cure rate and enhanced quality of Life (QoL) compared to long-term dialysis, making it a critical intervention option for patients with End Stage Renal Disease (ESRD) in Asia.* ***Objective:*** *This systematic review aims to identify the factors influencing post-transplant QoL in Asian recipients to provide valuable insights for guided healthcare interventions.* ***Material & Methods:*** *Structured by the updated Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines, we performed a comprehensive electronic-based literature search on PubMed, Cochrane, ScienceDirect, JSTOR, and Mendeley using the new PRISMA 2020 recommendations.We included observational studies that reported post-transplant quality of life and related variables, focusing on KT recipients with ESRD, and that were published between 2018 and 2023. We evaluated the reliability and validity of the included studies using the Joanna Briggs Institute Qualitative Assessment and Review Instrument, or JBI-QARI.* ***Results:*** *Out of 154 initial studies, we excluded 145 during screening and eligibility tests, resulting in nine applicable studies for this review. KT recipients consistently reported experiencing good QoL post-transplantation, with lower rates of depression compared to CKD patients. We observed significant differences in QoL between pre- and post-kidney transplant patients.* ***Conclusion:*** *This systematic review highlights the positive impact of KT on the QoL of Asian recipients. Understanding the factors influencing QoL, such as appearance, uncertainty/fear, physical symptoms, fatigue, and emotional well-being, can lead to personalized care and support, optimizing the overall well-being of KT recipients. Immunosuppressant benefits in graft rejection prevention must be balanced with potential risks to enhance patient outcomes. This study provides valuable insights to guide healthcare interventions for better patient care in the Asian population undergoing kidney transplantation.*

Keywords: *Kidney transplant, end stage renal disease, quality of life.*

ABSTRAK

Pendahuluan: *Transplantasi ginjal (KT) menawarkan manfaat signifikan terkait efektivitasnya dalam meningkatkan angka kesembuhan dan kualitas hidup (QoL) dibandingkan dengan dialisis jangka panjang, menjadikannya pilihan intervensi penting bagi pasien dengan Penyakit Ginjal Stadium Akhir (PGSA) di Asia.* ***Tujuan:*** *Tinjauan sistematis ini bertujuan untuk mengidentifikasi faktor-faktor yang memengaruhi kualitas hidup pasca-transplantasi pada penerima transplantasi di Asia guna memberikan wawasan berharga untuk panduan intervensi perawatan kesehatan.* ***Bahan & Cara:*** *Dengan berpedoman pada pedoman Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 yang telah diperbarui, kami melakukan pencarian literatur berbasis elektronik yang komprehensif di PubMed, Cochrane, ScienceDirect, JSTOR, dan Mendeley menggunakan rekomendasi PRISMA 2020 yang baru. Kami memasukkan studi observasional yang melaporkan kualitas hidup pasca-transplantasi dan variabel terkait, yang berfokus pada penerima transplantasi ginjal dengan penyakit ginjal stadium akhir (ESRD), dan yang dipublikasikan antara tahun 2018 dan 2023. Kami mengevaluasi reliabilitas dan validitas studi yang disertakan menggunakan Joanna Briggs Institute Qualitative Assessment and Review Instrument, atau JBI-QARI.* ***Hasil:*** *Dari 154 studi awal, kami mengecualikan 145 selama penyaringan dan uji kelayakan, sehingga menghasilkan sembilan studi yang relevan untuk tinjauan ini. Penerima transplantasi ginjal secara konsisten melaporkan mengalami kualitas hidup yang baik pasca-transplantasi, dengan tingkat depresi yang lebih rendah dibandingkan dengan pasien penyakit ginjal kronis. Kami mengamati perbedaan signifikan dalam kualitas hidup antara pasien sebelum dan sesudah transplantasi ginjal.* ***Simpulan:*** *Tinjauan sistematis ini menyoroti dampak positif transplantasi ginjal (KT) terhadap kualitas hidup (QoL) penerima transplantasi ginjal di Asia. Memahami faktor-faktor yang memengaruhi QoL, seperti penampilan, ketidakpastian/ketakutan, gejala fisik, kelelahan, dan kesejahteraan emosional, dapat mengarah pada perawatan dan dukungan yang dipersonalisasi, sehingga mengoptimalkan kesejahteraan keseluruhan penerima transplantasi ginjal. Manfaat imunosupresan dalam pencegahan penolakan cangkok harus diimbangi dengan potensi risiko untuk meningkatkan hasil pasien. Studi ini memberikan wawasan berharga untuk memandu intervensi perawatan kesehatan demi perawatan pasien yang lebih baik pada populasi Asia yang menjalani transplantasi ginjal.*

Kata Kunci: *Transplantasi ginjal, penyakit ginjal stadium akhir, kualitas hidup.*

Correspondence: Muhammad Bagus Fidiandra; c/o: Abdoer Raheem General Hospital. Jl. Anggrek No.68, Patokan Utara, Patokan, Kec. Situbondo, Kabupaten Situbondo, Jawa Timur 68312, Indonesia. Email: andrafidi@gmail.com.

INTRODUCTION

For individuals suffering from end-stage renal disease (ESRD), kidney transplantation (KT) is a vital intervention option. Compared to long-term dialysis, it offers substantial advantages in increased survival, higher quality of life, and lower healthcare costs.[1] The number of people with end-stage renal disease who need kidney transplants is increasing. According to Kim and Gill, this treatment significantly improves the patients' odds of survival, well-being, and quality of life.[2]

In Asia, the treatment of individuals with end-stage renal disease (ESRD) essentially involves kidney transplantation. The epidemiology of kidney transplantation in this region is closely tied to the occurrence and frequency of ESRD, as well as the availability and ease of access to transplant services. A study conducted by Hooi et al. indicates that the incidence of ESRD varies among different countries and regions in Asia.[3] The increasing demand for kidney transplantation can be attributed to factors such as an aging population, a higher prevalence of risk factors, including hypertension and diabetes, and improved awareness and diagnosis of kidney disease.

"An individual's perception of their position in life concerning cultural values of the system they live in along with their goal expectations, standards, and concerns" is how the World Health Organization defines quality of life (QoL).[4] Quality of Life (QoL) describes an individual's physical, psychological, social, and environmental well-being. Three terms that can be used interchangeably to refer to the same area of "health" are health status, functional status, and quality of life.[5] Both the illness itself and the patient's chosen course of therapy have an impact on the quality of life (QoL) of ESRD patients. Patients experiencing hemodialysis have a variety of characteristics that have been found to impact their quality of life (QoL). These include gender, age, length of dialysis, family care and support, living situation, patient compliance, education level, anti-depressant use, hospitalization, and gender, all of which have been linked to a lower QoL.[6]

In addition to having a significantly higher risk of graft loss and patient death, elderly patients also had significantly worse graft and patient survival rates. Due to dissatisfaction and lower levels of education, sleep and sleep disturbances were more common in renal transplant patients than in the general population. Negative aspects of living after renal transplantation involve having to follow a strict regimen of immunosuppressive medications and the side effects they cause, going to the doctor frequently, getting infections, being uncertain and anxious about rejection episodes, possibly losing the graft, the lifetime cost of the treatment, and being unemployed after the transplant.[7]

Due to a large population-to-medical professional ratio, patients in developing countries like Pakistan may experience communication difficulties with their doctors. Lack of transportation options can also hinder achieving the best quality of life because it can be expensive and time-consuming, interfering with patients' ability to recuperate and change their daily routines.7 According to a related Indian study, people who had kidney transplants have a substantially higher quality of life (QOL) than people who have opted for dialysis.[8] Due to factors like quality, safety, and transplant center availability, patients in developing countries encounter more challenges.[9]

OBJECTIVE

This systematic review aims to better understand the difficulties and requirements faced by transplant recipients, with the ultimate goal of enhancing patient outcomes through guided healthcare interventions. In this study, we evaluated the QoL and other related associated actors. CKD patients in all stages were included in this study.

MATERIAL & METHODS

We strictly followed the internationally recognized PRISMA 2020 guidelines to ensure this review's comprehensiveness, transparency, and accuracy.We conducted a refined search across biomedical databases, including PubMed, ScienceDirect, Cochrane Library, Journal Storage (JSTOR), and Mendeley databases, using MeSH terms and specific keywords, along with Boolean operators 'AND' and 'OR.' The keywords used were (("Kidney Diseases"[Mesh] OR "Chronic Kidney Diseases of Uncertain Etiology"[Mesh] OR "Kidney

Failure, Chronic"[Mesh]) AND "Kidney Transplantation"[Mesh]) AND "Quality of Life"[Mesh]. However, further literature searches found the literature using the phrases "Kidney Diseases," OR "Chronic Kidney Diseases of Uncertain Etiology" OR "Kidney Failure, Chronic) AND "Kidney Transplantation") AND "Quality of Life. In addition to electronic searches, we manually examined the reference lists of retrieved articles to uncover potentially relevant studies that automated searches might have missed.

The PICO Table is shown in Table 1. Titles and abstracts were reviewed for each study to identify potentially relevant articles. We searched for duplicate articles using the manual screening, and no duplicates were found in this screening. We independently conducted the screening based on the following eligibility criteria: observational studies (semi-experimental, cross-sectional, case-control, or cohort) published between 2018 and 2023, including patients of kidney transplant at any age with CKD (Stage 1-5), that reported the post-transplant quality of Life (QOL), and complication that related to outcomes. This study included studies conducted in Asia and published between 2018 and 2023, as well as those published in open-access and peer-reviewed journals involving research on humans. Excluded from this study were systematic reviews, non-English language articles, and studies deemed unacceptable according to JBI tools. The PRISMA flow diagram provides a detailed record of the search, selection, and screening procedures (Figure1).

Table 1. Population, Intervention, Comparison, and Outcome (PICO) of this study.

PICO	Search Keyword
Population	All types of kidney diseases
Intervention	Kidney Replacement Therapy (KRT) via Kidney Transplantation (KT)
Comparison	Non-Kidney Transplantation
Outcome	Quality of Life

We utilized standard forms to extract the data. After extensive conversations among the authors, we resolved discrepancies and reached a consensus conclusion. We extracted data, including study design, study period, demographic information, sample size, tools and methods for measuring quality of life (QoL), statistical analysis, and relevant study findings.

We performed a quality assessment independently and addressed discrepancies, and a unanimous decision was achieved after thorough discussions among the authors. The quality assessment was conducted with the Joanna Briggs Institute tool for appraised to minimize bias, consisting of 10 components: The research methodology and philosophical perspective, the research question or objectives study design, research methodology and methods used to collect data, research methodology and data representation and analysis, research methodology and results interpretation, a statement situating the researcher theoretically or culturally, the researcher's influence

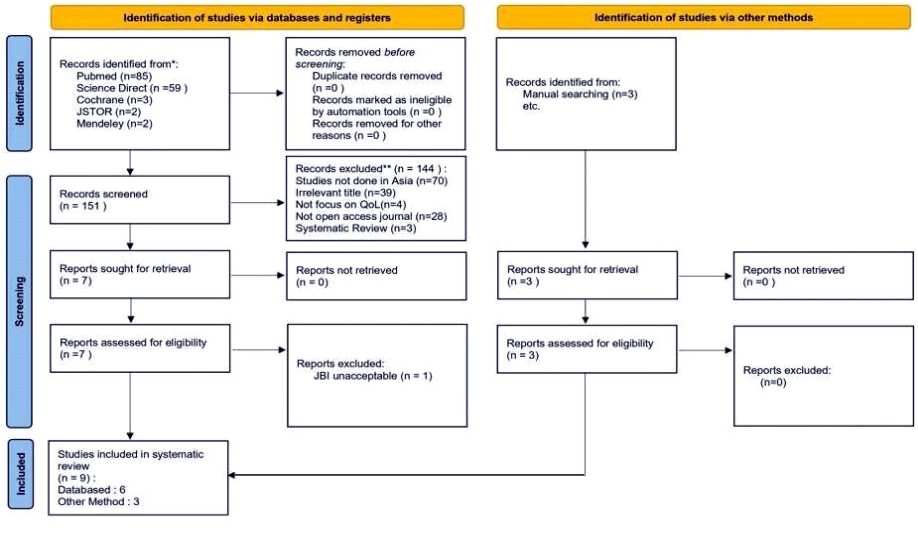

Figure1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)flow of this study.

Table 2. JBI Result. Y = Yes, N = No, UC = Unclear, NA = Not Applicable (Kapumba, Desmond and Seeley, 2020)

Study	Question										Score	Quality Band	Richness (thick or thin)	Publication type	Relevance (low, medium, or high)
	1	2	3	4	5	6	7	8	9	10					
Iyengar and McCulloch (2022)	NA	NA	NA	UC	UC	Y	UC	Y	Y	UC	3	Low	Thin	Journal	Low
Dweib et al. (2020)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	10	High	Thick	Journal	High
Iqbal et al. (2020)	Y	Y	Y	Y	Y	N	UC	Y	Y	Y	8	High	Thick	Journal	High
Ranabhat et al. (2020)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	10	High	Thick	Journal	High
Ryu et al. (2021)	Y	Y	Y	Y	Y	N	UC	Y	Y	Y	8	High	Thick	Journal	High
Cho et al. (2022)	Y	Y	N	Y	Y	N	UC	Y	Y	Y	7	High	Thick	Journal	Medium
Kute et al. (2022)	Y	Y	Y	Y	Y	Y	UC	Y	Y	N	8	High	Thick	Jorunal	High
Hasanzamani, Pourranjbar, and Ardani (2020)	Y	Y	Y	UC	Y	Y	UC	Y	Y	UC	7	High	Thick	Journal	Medium
Imamura et al. (2021)	Y	Y	UC	Y	Y	Y	UC	Y	Y	Y	8	High	Thick	Journal	High
Hwang, Kim, and Min (2021)	Y	Y	Y	Y	UC	Y	UC	Y	Y	Y	8	High	Thick	Journal	High

on the research, participant representation, ethical approval, and conclusion flow from analysis or interpretation are the first ten points of the research methodology. We scored study relevance and the quality band component as 1 (high), 2 (medium), or 3 (low). The richness of data is divided into 2groups (thick or thin). One study (Iyengar and McCulloch, 2022) was excluded due to an unclear method; the JBI assessment is shown in Table 2.

RESULTS

This research primarily assessed the quality of life and the related factors that affect patient quality of life: complications, sleep quality, and new onset diseases post-kidney transplant. We appraised the literature with JBI tools and analyzed the inclusion literature with full-text manual reading, including study results, discussion, and conclusion.

A search of PubMed, Science Direct, Cochrane, JSTOR, and Mendeley identified 151 studies in total. No duplicate articles or entries were found. Rescreening by reading the study's title and abstract resulted in the exclusion of 144 articles (Figure 1), including research not conducted in Asia, studies with irrelevant titles or abstracts, studies without a focus on quality of life and related aspects, studies without open access journals, and Systematic Review. Thus, seven investigations remained. Six research remain in the database, while one study (Iyengar and McCulloch, 2022) was deemed inapplicable upon evaluation utilizing JBI methods. We also identified studies using another method, which was random manual searching. We found 3 Reports assessed for eligibility. Of the 3 reports, all the studies were eligible; the total number of studies in this systematic review and applicable was 9. The result of this systematic review is shown in Table 3.

Table 3. Summary of the studies included in the review.

Author, Year, Country	Study design, Study Period, Population and Sample Size	JBI Assesment	QoL assessment, Statistical Analysis	Summary of Findings
Cho, S. et al., 2022 South Korea	**Study design** Retrospective cohort study **Study Period** January 2007 to December 2015	Medium	**QoL assessment** ICD - 10 code for depression diagnosis **Statistical Analysis** Kruskal –Wallis test, Chi -square test, Cox	1. KT recipients had a lower incidence of depression than ESKD patients (IR, 18.87 vs 58.03 per 1000 person-years; HR, 0.33; 95% CI, 0.30–0.37; $p < 0.001$) after adjusting for various factors. 2. After adjustment, KT recipients showed a lower risk of depression than HCs (adjusted HR, 0.52; 95% CI, 0.44–0.62; $p < 0.001$), while ESKD patients remained at a higher risk compared to

	Population and Sample Size KT recipients, ESKD patients, and Healthy Controls (HCs), each with 5234 matched subjects		Time - dependent Cox regression analysis	HCs (adjusted HR, 1.60; 95% CI, 1.36–1.87, $p < 0.001$). 3. Clinical characteristics associated with incident depression in KT recipients included age > 60 years, female sex, lower economic status, and higher Charlson Comorbidity Index (CCI) score. 4. Incident depression after KT increased the risk of all-cause mortality (HR, 4.46; 95% CI, 3.24–6.13, $p < 0.001$), graft failure (HR, 2.57; 95% CI, 1.99–3.31, $p < 0.001$), and death-censored graft failure (HR, 2.10; 95% CI, 1.48–2.99, $p < 0.001$). 5. Factors associated with increased risk of depression post-KT included older age, female gender, lower economic status, and higher CCI score. At the same time, the type and duration of renal replacement therapy (RRT) and immunosuppressant therapy were not significant predictors. 6. The study suggests that attention to psychological aspects is crucial in managing KT recipients and highlights the broader role of KT beyond mere physical improvement.
Dweib, K. et al., 2020 Palestine	**Study design** Descriptive, nonexperimental, cross-sectional study **Study Period** December 2016 to April 2017 **Population and Sample Size** Kidney transplant patients receiving care at MOH primary health-care clinics in Bethlehem and North Hebron, Palestine; Sample size: 109 patients	High	**QoL assessment** Kidney Transplant Questionnaire (KTQ) consisting of 25 items divided into five domains: physical symptoms, fatigue, uncertainty/fear, appearance, and emotional **Statistical Analysis** Descriptive statistics, ANOVA, Chi-square test	1. Overall mean QoL score for kidney transplant patients: 4.02 ± 0.84, indicating a moderate degree of discomfort post-transplant. 2. Highest QoL score was in the appearance domain (5.40 ± 1.23), while the lowest was in uncertainty/fear domain (3.36 ± 1.23). 3. Physical symptoms and uncertainty/fear had significant negative effects on QoL ($P = 0.000$), while appearance had a significant positive effect ($P = 0.000$). 4. Sociodemographic characteristics: Majority were male (79.8%), mean age 41 ± 24 years; most were married (81.7%) and had a school degree (65.1%); 45.9% were not employed, and 85.3% were nonsmokers. 5. Most common attributed causes of ESRD: hypertension (18.3%) and diabetic nephropathy (10.1%); surprisingly, 47.7% attributed ESRD to other reasons. 6. Most kidney donors were biological blood relatives (66.1%), while only a small percentage received kidneys from cadaveric donors. 7. Immunosuppressive medications used: Prednisone (83.3%), cyclosporine (45.4%), mycophenolate mofetil (70.4%), tacrolimus (53.7%). 8. No significant relationship between gender, age, education level, job status, donor type, immunosuppressive therapy, time after transplant, duration of dialysis before transplant, causes of ESRD, physical problems, number of transplants, smoking, comorbid disease, and QoL, except for marital status. Single patients had better QoL than married patients. 9. Time since transplantation and duration of dialysis before transplant did not significantly affect QoL. 10. Study findings align with international studies regarding QoL in kidney transplant patients, showing moderate QoL scores with appearance

				being the highest domain and uncertainty/fear being the lowest. 11. Excessive use of corticosteroids observed, raising concerns regarding long-term management post-transplant. 12. Significant variability in attributed causes of ESRD compared to global trends, with a substantial portion attributing ESRD to other reasons. 13. Limited impact of donor type on QoL, with most patients receiving kidneys from biological relatives. 14 No significant association found between education level, job status, duration of dialysis, and QoL, contrasting with some previous studies. 15. Marital status emerged as a significant predictor of QoL, with single patients reporting better QoL compared to married counterparts, potentially linked to social support dynamics.
Iqbal, M.M. et al., 2020 Bangladesh	**Study design** Cross-sectional study **Population and Sample Size** Renal transplant recipients (n = 15), CKD patients on maintenance hemodialysis (n = 20), CKD patients not on dialysis (CKD-ND) (n = 28), Healthy control group (n = 40)	**High**	**QoL assessment** Kidney Disease Quality of Life Short Form (KDQOL-SF-36) questionnaire, specifically the Bengali (Bangla) version **Statistical Analysis** Analysis of variance, Chi-square test, Pearson correlations	1. Renal transplant recipients had higher scores for QoL parameters compared to CKD patients on maintenance hemodialysis and CKD-ND patients. 2. Physical functioning, role physical, pain, general health, emotional well-being, role emotional, social function, and energy/fatigue domains of QoL were compared among study groups. 3. Transplant recipients showed significantly higher QoL scores in most domains compared to CKD patients on maintenance hemodialysis. 4. Patients on maintenance hemodialysis exhibited the poorest QoL scores in most domains compared to other study groups. 5. Higher QoL scores among transplant recipients were associated with lower serum creatinine levels, better BMI, and higher hemoglobin levels. 6. Improved QoL parameters post-transplantation were attributed to changes in renal function, including better control of blood pressure, improved anemia management, and better nutritional status. 7. Renal transplant recipients showed sustained improvements in social activities, job retention, and QoL scores over time compared to patients on dialysis. 8. The benefits of renal transplant on QoL were evident across age groups, with elderly transplant recipients showing significantly improved QoL scores compared to healthy counterparts after 1 year post-transplant. 9. Factors influencing QoL post-transplant include age at transplant, duration of dialysis, employment status, donor type, and socioeconomic conditions of the recipient. 10. While renal transplant recipients generally exhibited higher QoL scores compared to other RRT modalities, the true benefits in QoL depend on various patient-specific factors.
Ranabhat, K. et al. (2020) Nepal	**Study design** Cross-sectional comparative study	**High**	**QoL assessment** World Health Organization Quality of Life Instruments (WHOQOL-BREF)	1. Kidney transplant recipients had significantly higher Quality of Life (QOL) scores across all domains compared to haemodialysis patients. 2. Renal transplant was associated with better overall perception of QOL and general health.

	Study Period October and November 2018 **Population and Sample Size** 161 participants: 92 kidney transplant recipients, 69 haemodialysis patients		**Statistical Analysis** Descriptive analysis, chi-square test, Mann-Whitney U test, Kruskal-Wallis one-way analysis of variance	3. Haemodialysis patients scored significantly lower in physical, psychological, social relationship, and environmental health domains compared to transplant recipients. 4. Higher QOL associated with higher socio-economic status, education level, urban residence, and employment status. 5. Hypertension was the most common comorbidity among both groups. 6. Patients with renal transplant had higher QOL in the psychological and social domains, possibly due to decreased mental burden from frequent dialysis and increased self-esteem. 7. Haemodialysis patients experienced lower QOL in the physical domain, possibly due to physical pain, weakness, and hindrance to daily activities. 8. Environmental domain scores were lower in haemodialysis patients, likely due to financial barriers and safety concerns. 9. Socio-economic status positively correlated with overall QOL scores, indicating financial capacity's impact on QOL. 10. Employment status was associated with higher overall QOL, possibly due to better access to healthcare among the employed.
Ryu, J.H. et al. (2021) South Korea	**Study design:** Prospective, longitudinal cohort study **Study Period** 2011 to 2016 **Population and Sample Size** 1,080 kidney transplant (KT) patients from eight Korean transplantation centers and 2,238 chronic kidney disease (CKD) patients from nine clinical centers	High	**QoL assessment** Kidney Disease Quality of Life Short Form (KDQOL-SF, version 1.3) including kidney-specific part and general part (SF-36) **Statistical Analysis** Descriptive statistics, Student t-test, Mann Whitney U test, chi-square test, generalized estimated equation (GEE)	1. KT patients had higher SF-36 scores (physical and mental QoL) compared to CKD patients. 2. KT patients had similar CKD-targeted scores compared to CKD patients with similar renal function. 3. Independent prognostic factors for higher SF-36 scores in KT patients included absence of diabetes, higher blood hemoglobin level, higher income, married status, and current employment. 4. Independent prognostic factors for higher CKD-targeted scores in KT patients included absence of diabetes, higher blood hemoglobin level, higher income, married status, and current employment. 5. Both SF-36 and CKD-targeted scores decreased over time in CKD patients, whereas only SF-36 scores decreased over time in KT patients. 6. Absence of diabetes mellitus, higher blood hemoglobin level, higher income, married status, and current employment were associated with higher SF-36 scores in both KT and CKD patients. 7. Younger age, absence of hypertension, absence of diabetes mellitus, higher eGFR, higher income, married status, and current employment were associated with higher CKD-targeted scores in both KT and CKD patients. 8. KT patients had higher SF-36 scores than CKD patients at the same CKD stages, whereas CKD-targeted scores were similar between the two groups. 9. SF-36 scores improved after KT, but decreased over time, whereas CKD-targeted scores remained stable in KT patients. 10. The difference in SF-36 scores between KT and CKD patients increased over time, especially at CKD stage 3. 11. CKD-targeted scores did not significantly differ between KT and CKD patients over time, regardless of CKD stage.

Kute et al., 2022 India	**Study design:** Retrospective, multicentre cohort study **Study Period** June 26, 2020 - December 1, 2021 **Population and Sample Size** 372 kidney transplant recipients (365 living, 7 deceased donor KT)High	High	**QoL assessment** EuroQol five-dimension five-level (EQ-5D-5 L) questionnaire, EuroQol Visual Analogue Scale (EQ-VAS) **Statistical Analysis** IBM SPSS version 25, StataCorp STATA version 16	1. Incidence of acute rejection (AR) was 9.13%, with biopsy-proven rejection at 6.18%. 2. AR episodes were more frequent in patients with higher COVID-19 severity. 3. Lower AR risk observed in patients not requiring oxygen during COVID-19 infection. 4. Thymoglobulin induction associated with fewer AR episodes. 5. No significant differences in quality of life (QoL) among recipients based on COVID-19 severity. 6. Outcomes in high-risk transplantations (sensitized, ABO-incompatible) were favorable. 7. Safety of transplantation established even in cases with residual radiological abnormalities pre-transplant. 8. No donor-derived SARS-CoV-2 infections reported. 9. No long-term sequelae of COVID-19 observed in recipients or donors. 10. Transplantation and immunosuppression appeared safe despite varying COVID-19 transmission rates and immunosuppression protocols.
Hasanzamani et al., 2020 Iran	**Study design:** Semi-experimental study **Study Period** September 2017 to September 2018	Medium	**QoL assessment** Patient Information Checklist (PIC), Pittsburgh Sleep Quality Index (PSQI) **Statistical Analysis** Fisher's Exact test, Pearson Chi-square test, Paired samples t-test, Wilcoxon signed ranks test using SPSS 16	1. Kidney transplantation initially showed no significant improvement in sleep quality 3 months post-surgery. 2. At the 6-month follow-up, there was a significant reduction in sleep quality scores, indicating improved sleep after transplantation. 3. Prevalence of poor sleep quality decreased from 37.5% pre-transplant to 20.0% at 6 months post-transplant. 4. Despite improvements, 73% of patients reported moderate to severe problems in subjective sleep quality, 80% had prolonged sleep latency, and 77.5% experienced sleep disturbances. 5. No significant relationship was found between age, cause of renal failure, serum hemoglobin or phosphorus levels, type, or duration of dialysis with sleep quality. 6. Studies have shown high prevalence of sleep disturbances in CKD patients, but no consistent prognostic factors for sleep quality have been identified.
Imamura, R. et al. (2021) Japan	**Study design:** Retrospective Multicenter Cohort Study **Study Period** June 1965 to September 2019 **Population and Sample Size** 1973 kidney transplant recipients	High	**QoL assessment** Demographic characteristics and relevant information (transplant and cancer history, immunosuppressant regimens, dialysis duration before transplantation, renal allograft conditions, lifestyle habits, comorbidities) **Statistical Analysis** Mann–Whitney test, Kruskal–Wallis test, Chi-square test, Fisher's exact	1. Graft survival rate was higher in cancer-positive group - Overall patient survival rate was lower in cancer-positive group 2. Cancer-positive/rejection-negative group had highest graft survival rate 3. Cancer-positive/rejection-positive group had lowest patient survival rate 4. Overall survival rate declined due to diseases other than cancer in early period 5. 10 years after transplantation, cancer-positive group had decreased survival rate 6. Aggressiveness of immunosuppressive regimens might improve graft survival while increasing cancer risk 7. Older age, longer dialysis duration, and history of transfusion were significant predictors of cancer development

			test, Kaplan–Meier method with log-rank test, Gray's test, Cox proportional hazard regression analysis	8. Dialysis duration before transplantation was a prognostic factor for overall and cancer-specific survival 9. Regular cancer screening is essential for early diagnosis and improved survival rates
Hwang, Y., Kim, M., and Min, K. (2021) Korea	**Study design:** Cross-sectional, self-report survey **Study Period** December 19, 2019, to January 21, 2020	High	Perceived health status, post-traumatic growth, social support, self-determination, HRQOL (SF-36) **Statistical Analysis** Descriptive statistics, correlation analysis,	1. Perceived Health Status: Strongly associated with HRQOL, indicating its significance in predicting HRQOL among kidney transplant recipients. 2. Post-traumatic Growth: Positively correlated with HRQOL, suggesting that individuals who experience post-traumatic growth may evaluate their HRQOL more positively. 3. Social Support: Higher social support was linked to higher HRQOL, indicating the importance of social support in psychological adaptation for kidney transplant recipients. 4. Self-determination: Associated with the mental component summary of HRQOL, highlighting the role of basic psychological needs in psychological well-being. 5. Post-Transplant Employment: Having a post-transplant occupation positively influenced HRQOL, emphasizing the importance of stable income and economic status. 6. Income Source: Affects HRQOL, with recipients who are the source of their income showing higher HRQOL, suggesting the economic burden's impact on HRQOL. 7. Education Level: Linked to HRQOL, indicating that higher education levels might predict higher HRQOL among kidney transplant recipients. 8. Age: Significantly affects the physical component summary of HRQOL, indicating the need for targeted interventions for elderly transplant patients.

KTQ-25= Kidney Transplant Questionnaire, KDQOL = Kidney Disease Quality of Life Instrument (KDQOL), WHOQOL-BREF=World Health Organization Quality of Life Instruments, KDQOL-SF=Kidney Disease Quality of Life Short Form, SF-36 = Short Form Health Survey (SF-36),CCI = Charlson Comorbidity Index , EQ-5D-5 L=EuroQol five-dimension five-level,EQ-VAS= Euro Qol Visual Analogue Scale, PSQI=Pittsburgh Sleep Quality Index

Table 4. Summary of findings regarding kidney transplant (KT) and patients' quality of life (QoL).

Author, Year	Cho, S. et al. (2022)	Dweib, K. et al. (2020)	Iqbal, M.M. et al., 2020	Ranabhat, K. et al. (2020)	Ryu, J.H. et al. (2021)	Kute et al., 2022	Hasanzamani et al., 2020	Imamura, R. et al. (2021)	Hwang, Y., Kim, M., and Min, K. (2021)
Incidents of Psychological Disturbance	Lower incidence of depression in kidney transplant (KT) recipients compared to end-stage kidney disease (ESKD) patients and healthy controls (HCs)	Not specified	Not specified	Not specified	KT patients showed a lower incidence of psychological disturbance compared to CKD patients.	Not specified	Not specified	Not specified	Not specified

Quality of Life score	Not specified	Moderate degree of discomfor t indicated by mean QoL score of 4.02 ± 0.84	QoL is higher in transplant recipients compared to dialysis and CKD-ND patients.	QoL is higher in transplant recipients compared to dialysis patients.	QoL scores were higher in KT patients compared to CKD patients.	Prominent findings in anxiety domain. Most recipients had a scale of 2 (sight difficulties) in EQ-5D-5L. No difference in QoL across scales.	QoL improved post-kidney transplantation.	Not specified	Perceived health status, post-traumatic growth, social support, self-determinati on significantl y correlate with HRQOL
QoL Measurement Tools	ICD-10 code (F32, F33)	KTQ-25	KDQOL-SF and SF-36	WHOQOL-BREF	KDQOL-SF and SF-36.	EQ-5D-5L, EQ-VAS	PSQI questionnaire to assess sleep quality.	Not specified	SF-36
Behavioral Factors Affecting QoL	Not specified	Not specified	Not specified	Physical pain, mental burden, insomnia, social relationship s, and environmen tal factors influence QoL.	Not specified	Not specified	Anxiety and lifestyle changes.	Not specified	Self-determinati on, self-manageme nt, and post-traumatic growth .
Clinical Status and Biological Factors Affecting QoL	Comorbidit ies (hypertensi on, diabetes mellitus dyslipidem ia), Comorbidit y Index (CCI) score, renal replacemen t therapy (RRT) duration	Cause of ESRD, type of donor, time since transplantation, comorbid disease, immunosuppres sive therapy, smoking	Better BMI, higher hemoglobin , lower creatinine levels, better control of blood pressure, and nutritional status are associated with higher QoL. The true benefits of QoL depend on patient selection, years on dialysis, and donor type.	Hypertensio n and diabetes was not significant.	Clinical factors such as diabetes mellitus, higher blood hemoglobi n level, higher income, married status, and current employme quality of influenced quality of life	Severity of COVID-19, recovery time, waiting time from recovery to transplant, pre-transplant radiological abnormaliti es, laboratory tests during COVID-19 dialysis-recovery,	Surgery and immunosuppres sive drugs.	Longer dialy sis duration, history of transfusion associated with higher cancer risk; Immunosuppres sant regimen and dose, cancer screening protocols	Employme nt status, income source, education level affect HRQOL; age a primary factor for physical component summary
Socio-demographic and Environmental Factors Affecting QoL	Risk factors for incident depression include age > 60 years, female sex, and lower economic status	Age, gender, marital status, employment status, educational level, financial income. Marital status significantly affected QoL with single patients having better QoL. No significant effect observed for other demographic factors.	Age, education, employment status, income, other socioeconomic status, and social support.	Socioeconomic status, education employ ment, other financial barriers. No significant difference in QoL across gender, residence, marital status.	Not specified	Not specified	Not specified	Older age	Post-transplant employment, income source, education level, and social support.

Long-term Effects on QoL	Incident of depression after KT associated with increased risk of death, graft failure, and death-censored graft failure	Not specified	Not specified	Not specified	Kidney transplant was associated with better long-term quality of life compared to CKD.	Safety of transplantation post-COVID-19 recovery, outcomes in high-risk transplantation, post-operative complications	Positive long-term effect on sleep quality	Not specified	Need for supportive environment promoting basic psychological needs and impact of economic factors on HRQOL
Other Factors Affecting QoL	Not specified	Not specified	Antidepressant use, internet access, routine follow-up visits, income, job status, and psychologic support.	Environmental factors and social support affect QoL post-transplant despite financial support inadequacies.	Not specified	Younger patient cohort, retrospective design, varying COVID-19 transmission rates	Not specified	Not specified	Not specified

DISCUSSION

Psychological well-being is a critical aspect in managing kidney transplantation. The findings from Cho et al.[10] further highlight the broader role of transplantation beyond physical improvement. Across the studies reviewed, kidney transplant (KT) patients generally exhibited lower incidences of psychological disturbances such as depression and anxiety compared to end-stage kidney disease (ESKD) patients and non-transplant individuals.[11] These findings align with the Stress and Coping Theory, which suggests that individuals facing chronic stressors may experience psychological distress, while successful coping mechanisms, such as kidney transplantation and dialysis, can alleviate such burdens and improve mental health outcomes by restoring the kidney function.[12]

Regarding quality of life (QoL) outcomes, studies by Dweib et al. and Iqbal et al. demonstrate the positive impact of kidney transplantation on various domains of QoL compared to non-transplant individuals and those on maintenance hemodialysis.[13,14] The Biopsychosocial Model provides a framework for understanding these improvements, emphasizing the interplay of biological, psychological, and social factors in shaping individuals' well-being. The physical improvements resulting from transplantation, such as better control of blood pressure and improved anemia management, contribute to enhance QoL, while psychological factors, such as reduced mental burden from frequent dialysis, also play a significant role.

However, interpreting QoL outcomes requires careful consideration of the measurement tools employed in each study. Each study utilized different QoL measurement tools, such as SF-36, WHOQOL-BREF, and specialized transplant-specific questionnaires, offering unique insights into patients' QoL. The choice of QoL measurement tools, as discussed by Ryu et al. is crucial for accurately assessing patients' well-being.[15] The selection of appropriate tools is informed by theoretical considerations such as the Health Belief Model, which emphasizes the importance of individual perceptions of health and illness in shaping health behaviors. By using comprehensive measurement tools like SF-36 and CKD-targeted scores, researchers can capture the multidimensional nature of QoL and gain insights into various aspects of patients' well-being.[16] While SF-36 provides a broad assessment across physical and mental health domains, transplant-specific questionnaires offer detailed insights into issues specific to transplant recipients. Understanding each tool's strengths and limitations is crucial for accurately and comprehensively interpreting study findings.[17]

Behavioral factors, highlighted by Kute et al., significantly influence QoL outcomes in kidney transplant recipients.[18] The Bidirectional Model of Health Behavior suggests that improvements in QoL post-transplantation may motivate patients to engage in healthier behaviors, while pre-transplant behaviors, such as adherence to treatment regimens and lifestyle modifications, can impact post-transplantation recovery and adaptation. Addressing these behaviors through education and behavioral

interventions is essential for optimizing QoL outcomes. Additionally, post-transplantation behaviors, including medication adherence and engagement in self-care practices, are crucial for maintaining graft function and overall well-being.[19]

Patients' QoL can influence their behaviors both before and after transplantation. Poor QoL may lead to non-adherence to treatment regimens, unhealthy lifestyle choices, and social withdrawal, which can negatively impact transplant outcomes. Conversely, improvements in QoL post-transplantation may motivate patients to adopt healthier behaviors, adhere to treatment plans, and actively engage in self-care practices. Recognizing the bidirectional relationship between QoL and behavior is crucial for designing effective interventions to support kidney transplant recipients.[13,14]

Clinical status, comorbidities, and other biological factors also play significant roles in determining QoL outcomes post-transplantation. The findings of Imamura et al. and Ranabhat et al. highlight the importance of considering factors such as graft function, comorbid conditions (e.g., diabetes, hypertension), medical procedures, and overall health status in assessing patients' physical and mental well-being post-transplantation.[20,21,22] Additionally, complications related to immunosuppressive therapy and transplant-related surgeries may impact patients' QoL.[20] Understanding these clinical factors is essential for providing comprehensive care to kidney transplant recipients and addressing their unique needs.

Positive and negative effects of kidney transplant on patients' medical status, both CKD and non-CKD related, are crucial considerations in assessing QoL outcomes. While transplantation offers significant improvements in renal function, overall health, and survival rates, it also comes with potential risks, including the development of post-transplant complications such as infections, graft rejection, cardiovascular diseases, and the imposing side effects of immunosuppressive medications. The balance between the benefits and risks of kidney transplantation should be carefully considered in clinical decision-making to optimize patient outcomes.[10,13,14,23]

Medical procedures such as dialysis and medications used in the management of kidney disease can significantly affect QoL outcomes in transplant patients compared to non-transplant individuals. Dialysis, while life-saving, is associated with physical discomfort, psychological distress, and lifestyle restrictions, which may negatively affect patients' well-being.[14] Similarly, immunosuppressive medications post-transplantation can have side effects such as nephrotoxicity, metabolic disturbances, and increased susceptibility to infections, which may impact patients' QoL. Balancing the benefits and risks of these interventions is essential for optimizing patients' overall health and well-being.[20]

Sociodemographic and environmental factors further influence QoL outcomes in kidney transplant recipients, as discussed by Hwang et al. and Ranabhat et al.[20,21] The findings align with the Social-Ecological Model, which emphasizes the importance of considering factors such as socioeconomic status, educational attainment, social support networks, and access to healthcare services in promoting patients' ability to cope with the demands of transplantation and navigate post-transplant life. Environmental factors such as living conditions, access to transportation, and community resources also play crucial roles in shaping patients' QoL experiences. Addressing these factors through tailored interventions is essential for optimizing QoL outcomes in kidney transplant recipients.

Long-term effects of kidney transplant on patients' QoL compared to non-transplant individuals should be considered in the assessment of transplant outcomes. While kidney transplantation generally offers improvements in various domains of QoL, the interplay of clinical, psychosocial, and environmental factors can modulate these outcomes. A comprehensive understanding of the factors influencing QoL in kidney transplant recipients will be essential for developing tailored interventions and optimizing long-term outcomes.[14,21]

Beyond the factors discussed in the reviewed studies, other variables may impact the QoL of kidney transplant recipients compared to non-transplant patients. These might include perceived health status, post-traumatic growth, self-determination, psychological resilience, coping strategies, social support networks, and access to mental health services.[22] Furthermore, environmental factors such as socioeconomic status, healthcare infrastructure, cultural norms and beliefs, and spiritual practices could significantly shape patients' experiences post-transplantation. Recognizing and addressing these factors is essential for providing patient-centered care and optimizing

QoL outcomes in kidney transplant recipients. Furthermore, investigating these factors in future research could provide deeper insights into the complex interplay of variables affecting QoL outcomes in kidney transplant recipients.[14]

CONCLUSION

This systematic review highlights the positive impact of kidney transplant on the QoL of Asian recipients. The outcome of kidney transplant in ESRD patients in Asian Country is even better than conservative therapy. Understanding the factors influencing QoL, such as appearance, uncertainty/fear, physical symptoms, fatigue, and emotional well-being, can lead to personalized care and support, optimizing the overall well-being of KT recipients. Immunosuppressant benefits in graft rejection prevention must be balanced with potential risks to enhance patient outcomes.

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