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Dolor, Calidad de Vida y Bienestar Psicosocial en Donantes de Riñón Vivos: A Scoping Review
Pain, Quality of Life, Work Ability and Psychosocial Well-Being in Living Kidney Donors: A Scoping Review

Pain, Quality of Life and Psychosocial Well-Being in Living Kidney Donors: A Scoping Review

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Resumen

Fundamento: La Enfermedad Renal Crónica (ERC) es una condición progresiva caracterizada por alteraciones estructurales y funcionales en los riñones, que afecta al 10-15% de la población mundial. El trasplante de riñón de donantes vivos se considera el tratamiento más eficaz para la ERC, aunque los donantes pueden enfrentar reducciones en su salud general y capacidad para trabajar después de la donación.

Objetivos: El objetivo de este estudio es evaluar la calidad de vida (Cv), el dolor y la salud mental de los donantes adultos de riñón vivos.

Métodos: Se realizó una revisión exploratoria utilizando las bases de datos PubMed/Medline, Embase, CINAHL y Cochrane Library. La revisión siguió el marco de trabajo del Joanna Briggs Institute (JBI) y se ajustó a las directrices PRISMA-ScR. El protocolo para esta revisión fue registrado en el Open Science Framework. Se evaluó el riesgo de sesgo y la calidad de los estudios utilizando las listas de verificación de JBI.

Resultados: Con base en el análisis de 5069 registros, se incluyeron 10 estudios en esta revisión exploratoria. Los resultados muestran una presencia frecuente de dolor de intensidad media y alta en los donantes después de la cirugía; la salud mental está moderadamente comprometida y relacionada con síntomas de ansiedad y depresión. De interés, la CV mejoró después de la intervención, lo que sugiere una fase de adaptación tras la donación de riñón.

Conclusión: Esta revisión resalta los efectos positivos de la donación de riñón en los donantes vivos y la necesidad de mejorar el manejo del dolor y el apoyo a la salud mental en el primer período posterior a la cirugía. También aboga por la continuación de la investigación interdisciplinaria para desarrollar estrategias de cuidado basadas en evidencia que promuevan el bienestar multifacético de los donantes.

Palabras clave: Dolor; Calidad de vida; Donante; Riñón; Enfermedad Renal Crónica; Revisión Exploratoria

Abstract:

Background: Chronic Kidney Disease (CKD) is a progressive condition characterized by structural and functional impairments in the kidneys, affecting around 10-15% of the global population. Kidney transplantation from living donors is regarded as the most effective treatment for CKD. Little is known about the consequences in kidney donors in term of quality of life, work ability and overall health status, including pain syndromes developing.   This may drive intervention to support donors and promoting their engagement.

Aims: This scoping review evaluates the quality of life (QoL), pain syndromes occurrence, mental health and work ability of adult living kidney donors.

Methods: A scoping review was performed using the PubMed/Medline, Embase, CINAHL, and Cochrane Library databases between April and September 2023. The review followed the Arksey and O'Malley framework, incorporated guidance from the Joanna Briggs Institute (JBI), and reported to PRISMA-ScR guidelines. The protocol for this review was registered on the Open Science Framework. Risk of bias and study quality were assessed using JBI checklists. *Results*: Starting from the analysis of 5069 records, 10 studies were included in the present study. The results show scanty data about the issues. The occurrence of medium and high intensity pain after surgery is reported; mental health seems to be moderately compromised and related to symptoms of anxiety and depression. Of interest, QoL seems to be overall improved after the kidney donation, suggesting a phase of adaptation following the surgery. No data are available on the work ability changes after donation

Conclusion: This review emphasizes the presence of positive effects of kidney donation in living donors and, on the other hand the need of improving pain management and mental health support in the first time after surgery. The information about the consequences of kidney donation on work ability is completely lacking. This could be relevant to be known for new potential donors. It also advocates for continued interdisciplinary research for developing evidence-based care strategies to promote donors' multifaceted well-being.

Keywords Kidney transplantation, kidney donors; Chronic Kidney Disease; Pain**:** Quality of life; Work-ability

Introduction

Chronic Kidney Disease (CKD) is a significant global health issue, characterized by a glomerular filtration rate (GFR) below 60 ml/min and/or evidence of kidney damage, such as albuminuria, persisting for at least three months. This condition impacts approximately 15% of the global population [1-4], with higher prevalence observed among women, older adults, and those with diabetes or hypertension [5, 6]. The burden of CKD has risen substantially, with mortality rates increasing by 41.5% between 1990 and 2017 [7], and it is anticipated to become the fifth leading cause of death by 2040 [8]. The economic impact of CKD is also significant: in Europe, it accounts for approximately 1.3% of total healthcare expenditure [9-11], and costs may exceed $10,000 per patient by the fifth year after diagnosis [12].

End-stage renal disease (ESRD), the final stage of CKD, requires renal replacement therapy (RRT) such as haemodialysis or peritoneal dialysis. Although life-sustaining, these treatments are associated with complications and significant impacts on quality of life [13–19]. For this reason, kidney transplantation, especially from living donors, is considered the best available treatment option [20-26]. Emerging research also highlights the interplay between autonomic function, pain perception, and psychological well-being, suggesting that dysregulations in sympathetic activity may negatively influence quality of life in populations experiencing chronic stress or pain, such as fibromyalgia patients [37, 38]. Previous studies have suggested a potential increased risk of hypertension and renal dysfunction after kidney donation, which may affect long-term well-being [39-40].

Despite improvements in transplant practices, the number of living kidney donors (LKDs) remains relatively low [27-29]. Yet, recent evidence suggests that living kidney donation may not be free from long-term consequences for donors themselves. While often perceived as a safe procedure, donation can impact physical and psychological well-being, leading to challenges such as post-operative pain, reduced work capacity, and symptoms of anxiety or depression [30–36]. The information about the potential consequences in term of overall physical, mental health and work ability may increase the awareness of the donors.

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Study objectives

This scoping review aimed to explore the pain, quality of life, work ability and mental health of LKDs, with a focus on psychological aspects such as anxiety and depression.

Methods

Study Design

This scoping review followed a protocol that was registered in advance on the Open Science Framework on December 4, 2023 (doi: xxx). The review methodology was based on the framework outlined by the Joanna Briggs Institute (JBI) [39]. The study was reported according to the PRISMA-ScR (Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews) guidelines [40, 41]

Formulation of research question

The PCC framework was used to formulate the research question. The Population (P) considered adult living kidney donors, the Concept (C) focused on kidney donation and associated outcomes such as pain, quality of life, work ability mental health, anxiety, and depression, while the Context (C) included both community and hospital settings.

Eligibility criteria

The inclusion criteria were refined after a preliminary search of databases such as PubMed/Medline and Google Scholar. This scoping review included quantitative and primary studies that were available in full text. For inclusion, articles had to address the variables under investigation, namely pain, quality of life, or mental health of LKDs. Additional criteria encompassed studies conducted in both community and hospital settings and studies written in either Italian or English. Data extracted from the selected articles were analyzed based on the study objectives, sample characteristics, geographical context, and healthcare environment. There were no restrictions on the publication time frame. Studies that did not meet these criteria, as well as records such as books, editorials, conference papers, posters, secondary studies (reviews, meta-analyses), guidelines, studies on surgical techniques, pharmacological interventions, or economic aspects, were excluded. Only studies published in English or Italian were included due to the linguistic competence of the review team and the aim of ensuring accurate interpretation of results.

Search strategy

A comprehensive literature search was conducted across four databases: PubMed/Medline, Embase, CINAHL, and the Cochrane Library, to identify relevant studies. The selected records were then imported into EndNote 20 software (accessible at https://endnote.com/), where duplicates were manually removed to ensure an accurate reference list for subsequent analysis [42]. Search strings were developed using MeSH terms and relevant keywords, tailored for each database. The terms 'donor,' 'living,' 'kidney,' 'quality of life' and ‘ work ability’ were selected based on the study's eligibility criteria. Google Scholar was consulted for grey literature to broaden the review. In line with the methodology adopted [38,40], reference lists and citations of full-text articles were screened for additional studies. Detailed search strings are provided in Supplementary File 1, ensuring transparency and reproducibility

Selection of evidence source

Two researchers (xx and xx) independently conducted the two-stage screening process, with conflicts resolved by a third author (MS), who was not involved in screening. In the first stage, titles and abstracts were reviewed, and studies involving non-CKD patients or those with incompatible designs were excluded. Articles with unclear population, intervention, or outcomes were also removed. This step efficiently filtered irrelevant studies, avoiding unnecessary full-text reviews. In the second stage, full texts of eligible records were retrieved using EndNote, internet searches, and journal access. The references and citations were reviewed to identify any additional relevant studies. During the final full-text screening, predefined inclusion and exclusion criteria were applied, leading to the exclusion of incorrect publication types and studies that did not address the pertinent variables.

Evaluation of risk of bias and methodological quality of studies

The potential bias and methodological rigor of the selected studies were independently evaluated by two researchers (xx and xx) using the JBI critical appraisal checklists. In instances where discrepancies arose, a neutral third reviewer (xx) provided resolution. Studies were categorized based on quality, following criteria from a prior study [43], where those scoring above 70% on the JBI scale were considered high quality, scores between 50% and 70% were deemed medium quality, and those scoring below 50% were classified as low quality (Supplementary File 1).

Data extraction and synthesis

The process was conducted by two researchers (xx and xx) to ensure a robust and unbiased approach. The results were reported in a table, extracting the following data: author, publication year, country, study design, sample size, aim, measurements used, main results, limits, and quality of study. The data were synthesized narratively, detailed in the text, and complemented by visual figures for clarity and integration.

Results

Through searches in bibliographic databases, a total of 5068 articles were identified: 67 from Cochrane Library, 2242 from PubMed-Medline, 587 from CINAHL, 2172 from Embase, and one from other sources (Google Scholar). During the selection process, 2082 duplicates were eliminated. Following the analysis of article titles, 2987 were retained, which were then evaluated by reading the titles and abstracts. Of these, 2934 were deemed irrelevant, while the remaining 53 underwent a comprehensive evaluation. However, 43 of these were excluded as they did not meet the inclusion criteria for the research. At the end, 10 studies were included in the screening process. The screening process is detailed in the Prisma-ScR Flow-Diagram, (Figure 1).

Figure 1. Prisma-ScR Flow-Diagram

(Please insert Figure 1)

The included studies were conducted in European countries, like the United Kingdom [44], the Netherlands [45,46], and Germany [47], in Brazil [48], in Eastern countries, like Saudi Arabia [49], China [50], India [51] and Taiwan [52], and in Australia [53]. The articles presented different study designs, specifically: eight cross-sectional studies [45,46,48-53], and two retrospective studies [44,47].

The total sample of patients across the studies was 1554, ranging from a minimum of 14 to a maximum of 512 living kidney donors per study (mean 129.5; SD 145.77). Concerning the risk of bias, the majority of included studies demonstrated high methodological quality [45,46,48-51] and four showed medium methodological quality [44,47,52,53]. None of the included studies were classified as low methodological quality (Table 1).

Table 1. Characteristics of included studies

Author, Year, (Country)	**Study Design**	**Sample (n)**	**Study Aim**	**Instrument**	**Results**	**Limitation**	**Quality/ Bias**
Bruintjes et al., 2019[45] **(Netherlands)**	Cross-sectional study	LKDs (n=512)	Post-donation pain	MPQ VAS PRI-T	↓ Pain	The incidence of pain was not evaluable; patients with a short follow-up might attribute pain issues to the nephrectomy	+++ / Low
Owen et al., 2010[44] **(UK)**	Retrospective Observational study	LKDs (n=123)	Post-donation pain	S-LANSS BPI	↓ Pain	Response rate of 66%	++ / Medium
Alhussain et al., 2019[49] **(Saudi Arabia)**	Cross-sectional study	LKDs (n=60)	Post-donation QoL	KDQOL-SF	↑ QoL	Small sample size; single centre	+++ / Low
Chien et al., 2010[52] **(Taiwan)**	Cross-sectional study	LKDs (n=14)	Pre- and post-donation QoL	SF-36	↑ Pre-donation QoL ↓ Three months post-donation QoL	NR	++ / Medium
de Groot et al., 2012[46] **(Netherlands)**	Cross-sectional study	LKDs (n=316)	Post-donation QoL and Mental health	SF-36 MCS	↑ QoL ↓ Mental health	The quality of life was not assessed before the donation	+++ / Low
Garcia et al., 2013[48] **(Brazil)**	Cross-sectional study	LKDs (n=50)	Pre- and post-donation QoL	SF-36	↑ Pre-donation QoL ↓ Three months post-donation QoL ↑ One-year post-donation QoL	Single centre	+++ / Low
Guleria et al., 2011[51] **(India)**	Cross-sectional study	LKDs (n=100)	Pre- and post-donation QoL and Mental health	WHO-QOL BREF HADS	↑ Pre-donation QoL ↑ Six months post-donation QoL ↑ Pre-donation Mental health ↑ Six months post-donation Mental health	NR	+++ / Low
Hoda et al., 2010[47] **(Germany)**	Retrospective Observational study	LKDs (n=48)	Post-donation QoL	WHOQOL-BREF SF-36	↑ Post-donation QoL	Small sample size	++ / Medium
Shi et al., 2023[50] **(China)**	Cross-sectional study	LKDs (n=122)	Post-donation QoL and Mental health	WHOQOL-BREF	↓ QoL ↓ Mental health	NR	+++ / Low
Smith et al., 2004[53] **(Australia)**	Cross-sectional study	LKDs (n=48)	Post-donation mental health	SF-36	↑ Pre-donation mental health ↓ Post-donation mental health	NR	++ / Medium

Legend: LKD: Living Kidney Donors; KDQOL-SF: Kidney Disease Quality of Life Instrument; MPQ: McGill Pain Questionnaire; BPI: Brief Pain Inventory; S-LANSS: Leeds Assessment of Neuropathic Symptoms and Signs; VAS: Visual Analog Scale; PRI-T: Pain Rating Index; SF-36: Short Form Health Survey; WHOQOL-BREF: World Health Organization Quality of Life brief version; MCS: Mental Component Summary; HADS: Hospital Anxiety and Depression Scale; NR: Not Reported. Quality/Risk of Bias according to JBI Critical Appraisal Tools

Pain

Two studies [44, 45], delve into the prevalence and characteristics of post-donation pain among LKDs, employing various questionnaires such as the McGill Pain Questionnaire (MPQ), Brief Pain Inventory (BPI), Leeds Assessment of Neuropathic Symptoms and Signs (S-LANSS), the Visual Analog Scale (VAS) and the Pain Rating Index (PRI-T) to assess pain levels and characteristics. Bruintjes et al. [45] focused on 512 LKDs, finding that 5.7% (29 patients) reported chronic pain following laparoscopic nephrectomy. A notable 12.2% prevalence of chronic pain was observed in patients 3 to 24 months' post-surgery. Among these, 55.2% experienced mild pain and 34.5% severe pain. The pain was mostly continuous for 48.3% of the patients and intermittent for 37.9%, with common locations being the flank (25.0%), groin (18.2%), and supra-pubic area (15.9%). Pain severity was quantitatively assessed using the Visual Analogue Scale-VAS (Range 0-100) with an average score of 20 (± 22), and the PRI-T (Range 0-63), averaging at 10.21 (± 9.06). Younger patients (age 35-39) reported higher pain intensity ($p = 0.01$) than older patients (age 60-65). Among them, 27.6% needed pain relief medications like paracetamol or non-steroidal anti-inflammatory drugs, while one patient reported using tramadol. Owen et al. [44], on the other hand, studied 123 LKDs over a decade post-nephrectomy, with 66% (81 respondents) participating. Among these, 33% experienced chronic pain (over 3 months duration), and 26% suffered from chronic, surgery-related pain. Severe and disabling pain (score of $\geqslant 7$ out of 10 using the brief pain inventory) was reported by 48%, and neuropathic pain by 20%, based on the S-LANSS score (>12). Among those with chronic pain, a third required analgesia, which provided 41% relief on average; however, most relief was achieved through basic medications like ibuprofen, paracetamol, and codeine-based drugs.

Mental health

Four studies [46,50,51,53] investigated the mental health of LKDs using various assessment tools, including the World Health Organization Quality of Life brief version (WHOQOL-BREF), the Short Form Health Survey 36 (SF-36), the Hospital Anxiety and Depression Scale (HADS), and the Mental Component Summary (MCS). These studies primarily focused on measuring levels of anxiety, depression, and the overall psychological state of LKDs. The cross-sectional study by Shi et al. [50], evaluated 122 LKDs with the WHOQOL-BREF questionnaire. They found that LKDs experienced psychological distress post-donation, characterized by anxiety in 43.4% and depression in 29.5% of them. Similarly, another study, [53] offered a comparative perspective, assessing the evolution of anxiety and depression symptoms in 48 LKDs through the SF-36 questionnaire. The 12-month prevalence of depressive and anxiety disorders following surgery was found to be 18%. Specifically, psychological disorders at the 12-month mark, assessed using the SF-36 questionnaire, were linked to the donor's psychosocial function (Mental Component Summary) ($P<0.01$), physical function (Physical Component Summary) at both 4 and 12 months ($P<0.01$), and the recipient's psychological condition at 12 months ($P<0.05$). De Groot et al. [46] reported that 18% of 316 donors surveyed experienced reduced mental function post-donation, as measured by the Mental Component Summary (MCS) of the Health-Related Quality of Life (HRQoL) scale. In contrast, Guleria et al [51] who studied 100 LKD women, showed an overall improvement in post-donation psychological status assessed by the World Health Organization Quality of Life Questionnaire (WHO QoL Bref) and the Hospital Anxiety and Depression Scale (HADS) compared to the pre-donation condition ($p = 0.000$). Specifically, all donors experienced an improvement in the psychological domain of the questionnaire ($p<0.0001$) and, in particular, mother donors demonstrated a significant decrease in depression score ($p < 0.0001$). The study did not demonstrate a significant change in anxiety scores ($p = 0.065$) after kidney donation. Due to the international nature of the included studies, results may not be directly applicable to the Italian healthcare context or to other specific national populations.

Quality of Life

Seven studies [46-52] provide a broad assessment of QoL among LKDs, by using different tools including the WHOQOL-BREF, the SF-36, and Kidney Disease Quality of Life Instrument (KDQOL-SF). Some studies evaluated QoL both before and after kidney donation [48,51,52], while others focused exclusively on the phase after the donation [46,47,49,50].

Chien et al. [52] conducted a study involving 14 LKDs, to investigate changes in their QoL through the SF-36 questionnaire before and three months after laparoscopic nephrectomy. They found a decline in physical function, role limitations and general health perceptions reduction after donation compared to baseline (SF-36 score 80.4 ± 16.6 vs92.9 ± 5.0; $p = 0.004$). A similar result was observed in the longitudinal prospective study by Garcia et al. [48], which evaluated the quality of life (QoL) of 50 living kidney donors (LKDs) before donation, as well as three months and one year after donation. The study found consistent QoL scores one-year post-donation (physical health = 60.40 ± 3.1) compared to pre-donation levels (physical health = 59.67 ± 4.4). After one year, 72% of donors reported an improvement in their health, while 22% stated their health remained unchanged. Additionally, three studies [46, 47, 50] examined the QoL and physical health of kidney donors, comparing their results to those of the general population. De Groot et al. [46] assessed the health-related quality of life (HRQoL) in 316 donors who donated between 1997 and 2009, finding that, on average, donors exhibited a higher HRQoL than the general population. However, 12% of donors reported lower physical HRQoL (Physical Component Summary, PCS), which was associated with a higher body mass index (BMI) and pre-donation smoking habits. These individuals also experienced increased fatigue and reduced social participation. Similarly, another study [47] found that donor QoL scores were consistently higher than those of the general population, regardless of the time elapsed since donation. In this study, 91% of donors rated their health as good, very good, or excellent, with only 6% describing it as fair and 3% as poor. Additionally, 91% reported experiencing mild or no pain around the surgical scar, and 94% indicated they would donate again if given the opportunity. In contrast, the study by Shi et al. [50] found that donors' physical QoL was lower than that of the general population. It was observed that the recipient's poor health negatively impacted all domains of the donors' QoL, including the physical dimension. A graphical summary of the results is shown in Figure 2. The heterogeneity of the instruments used and the sociodemographic variability among donors limit the comparability of results and preclude definitive conclusions or generalizability to specific populations. Although work ability represents a key component of post-donation recovery and long-term donor well-being, no studies included in this scoping review have examined this outcome. The absence of data in this domain is particularly concerning, given that the ability to resume occupational activities constitutes a crucial element of psychosocial reintegration and may significantly affect donors' physical health, mental well-being, and socioeconomic stability. This notable gap underscores the importance of future investigations aimed at systematically assessing the impact of living kidney donation on occupational functioning and vocational trajectories.

Figure 2. Synthesis of Outcomes in Living Kidney Donors: Pain, Quality of Life, Mental Health, and Gaps in Work Ability Evidence

(Please insert Figure 2)

Legend. Summary of the results of the scoping review

Discussion

In this review pain, mental health outcomes, and overall quality of life among LKDs has been investigated.

As reported in Figure 1, few studies addressed the above effects of kidney donation in LKDs even though these issues are crucial for promoting this fundamental therapeutic strategy in patients suffering with CKD [16,23,28].

Similarly to what observed in other living donors such as liver [54, 55], lobar lung [56], and marrow or peripheral blood stem cells donors [57, 58], LKDs experienced chronic pain [44,45] . The prevalence and intensity of chronic pain among LKDs after surgery should be more adequately addressed in clinical setting by developing new pain management strategies tailored to this population [59] as already suggested for other living donors [60, 61]. Addressing chronic pain in living donors is crucial to prevent or reduce the potential drop of physical, psychological well-being [45] and workability after surgery that is strictly related with the pain intensity [62]. In addition, the pain treatment programs after donation should be a part of the LKDs training donors performed by the healthcare providers also aimed at promoting future donations [63].

The results of the studies that addressed mental health outcomes in living kidney donors (LKDs) are contrasting. While three studies [46, 50, 53] reported anxiety and depression among LKDs, Guleria et al. [51] found an improvement in psychological well-being post-donation, a difference that may be attributed to the specific sample in the latter study, which primarily consisted of kidney donor mothers. These findings are consistent with a previous study that demonstrated how donors who are emotionally or biologically connected to the recipients tend to show improvements across various domains, including psychological well-being [64]

Notably, a complex psychological response to organ donation, likely influenced by individual factors such as religious affiliation, pre-existing mental health conditions, social support systems, and personal motivations for donation [65] may also contributed to different results. Further research are necessary to fill the gap and to clarify the mental health trajectories of LKDs and identify predictors of positive and negative psychological outcomes that may help the more accurate selection of LKDs.

The impact of kidney donation on overall QoL is also complex to be addressed and interpreted by the available studies, even because Mental Health is a part of QoL. While some studies report a short-term decline in general QoL [48, 50, 52], others indicate QoL stability or improvement over time [46, 47, 49, 51]. These observations may reflect an adaptive process of the donors. Indeed, it seems that the initial challenges are gradually overcome, resulting in QoL synthetic scores similar or higher than those reported by the general population [29,33]. The presence of similar patterns among liver donors [66-68] supports the notion of a common adaptive response among living donors that should be confirmed by larger prospective studies and emphasized during donor's training. Indeed, the scanty data available by now suggest that kidney donation may initially affect QoL. However, a percentage of donors successfully adapt and may derive personal fulfilment from their supporting behaviors [69].

These findings emphasize the necessity for comprehensive pre-donation education and post-donation care, ensuring donors are aware of potential chronic pain, mental health challenges, and QoL impacts. Enhanced support measures, including effective pain management [70] and mental health support [71], are vital for donor well-being. Future research should focus on long-term outcomes and explore non-pharmacological strategies, such as virtual reality and meditation, to improve LKDs support and care, similar to interventions already used in oncology to enhance patient well-being during procedures [72, 73]. Finally, no data are available on the effects of kidney donation in working performance that may represent a raison of concern.

The current literature on the psychosocial outcomes of living kidney donors including impact on working capability remains limited in both scope and depth. This notable scarcity of comprehensive and longitudinal studies highlights a pressing need for further research to better understand and support the complex experiences of these individuals.

Study Limitations

The main limitation of this review lies in the predominantly observational nature of the included studies, which restricts the ability to establish clear causal relationships between the variables analyzed. Additionally, the studies showed significant variation in methodological quality. These constraints may weaken the reliability of the review's conclusions, underscoring the need for future research, preferably using well-designed randomized controlled trials (RCTs), to confirm the findings. Moreover, differences in outcome measurement tools across studies and linguistic limitations in study selection may further restrict generalizability. The predominance of non-Italian contexts also raises questions about applicability to national populations.

Conclusions

This review underscores the complexities of the LKDs experience, highlighting the essential roles of effective pain management and mental health support in optimizing outcomes for donors. Moreover, additional relevant issues such as the impact on working performance after donation remain absolutely unknown. The evidence suggests a need for ongoing research and innovation in donor care practices, with a focus on interdisciplinary approaches that encompass the physical, psychological, and social dimensions of donor well-being. Future studies should aim to further elucidate the factors influencing LKDs outcomes, with an emphasis on developing evidence-based interventions that can be integrated into donor care protocols globally.

Scoping Review Protocol Registration

This scoping review followed a protocol registered prospectively on Open Science Framework on December 4, 2023 (doi: 10.17605/OSF.IO/FPEQN).

Use of AI tools declaration

The authors declare they have not used Artificial Intelligence (AI) tools in the creation of this article.

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Conflict of interest

The authors declare no conflict of interest

Author's contribution

GDC: Conceptualization, Methodology, Writing Original Draft, Review & Editing, Investigation, Visualization; **BM:** Conceptualization, Methodology, Writing Original Draft, Review & Editing, Investigation, Data Analysis, Visualization; Coordinator; **GC:** Methodology, Review & Editing; **MS:** Conceptualization, Methodology, Review & Editing; Coordinator; **SMP:** Review & Editing, Visualization; **FB:** Conceptualization, Methodology, Review & Editing, Visualization; **CC:** Conceptualization, Methodology, Review & Editing, Visualization; **FR:** Review & Editing, Visualization; **MC:** Review & Editing, Visualization; **DC:** Review & Editing, Visualization; **DL:** Review & Editing, Visualization; **GA:** Conceptualization, Methodology, Review & Editing, Visualization; Coordinator; **SM:** Conceptualization, Methodology, Writing Original Draft, Review & Editing, Visualization; Coordinator;

GDC and BM provided an equal contribution as first author in drafting the manuscript. GA and SM provided an equal contribution as last author in drafting the manuscript. All authors read and approved the final manuscript.

Supplementary Files: Search strategy; Quality and risk of Bias JBI Critical Appraisal Tools

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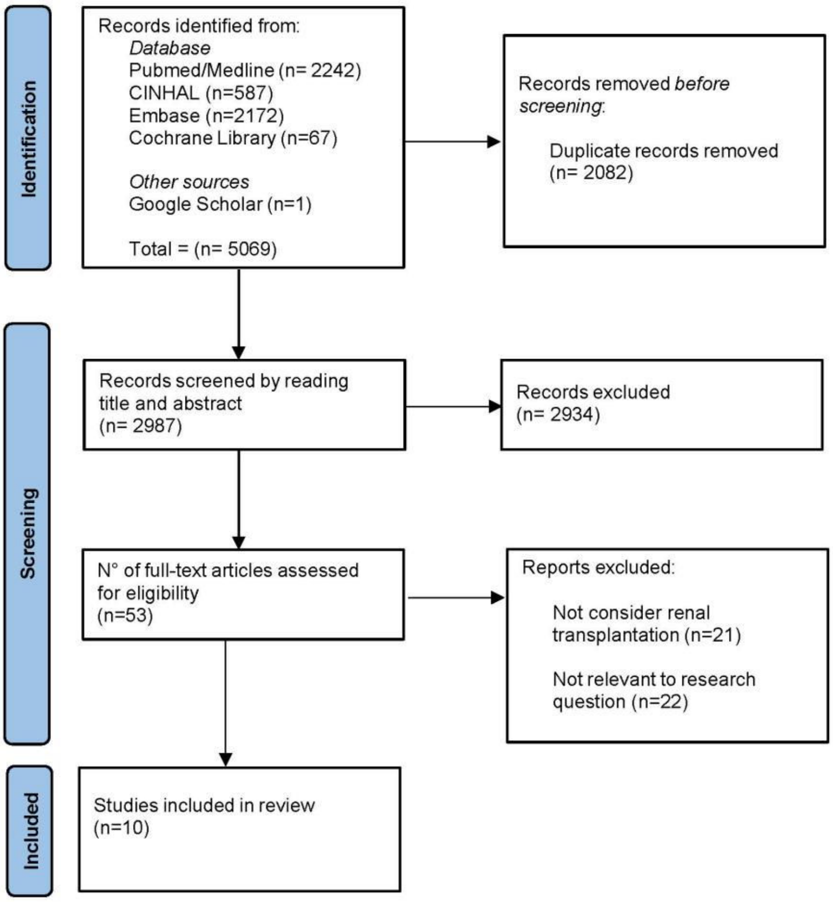
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Duplicate records removed (n= 2082)
Screening
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Not relevant to research question (n=22)
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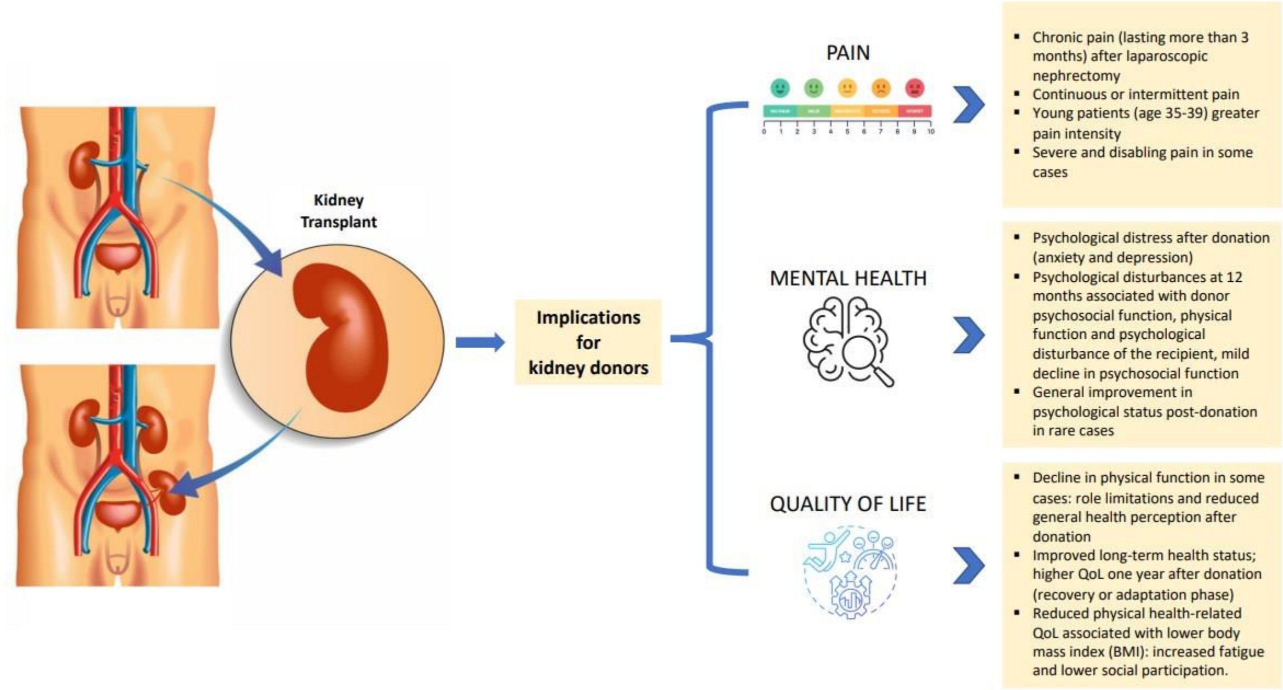

Implications for kidney donors

PAIN

- Chronic pain (lasting more than 3 months) after laparoscopic nephrectomy
- Continuous or intermittent pain
- Young patients (age 35-39) greater pain intensity
- Severe and disabling pain in some cases

MENTAL HEALTH

- Psychological distress after donation (anxiety and depression)
- Psychological disturbances at 12 months associated with donor psychosocial function, physical function and psychological disturbance of the recipient, mild decline in psychosocial function
- General improvement in psychological status post-donation in rare cases

QUALITY OF LIFE

- Decline in physical function in some cases: role limitations and reduced general health perception after donation
- Improved long-term health status; higher QoL one year after donation (recovery or adaptation phase)
- Reduced physical health-related QoL associated with lower body mass index (BMI): increased fatigue and lower social participation.