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# Nursing Care for Kidney Transplant Patients: A Scoping Review\*

**Theme:** Chronic care.

**Contribution to the discipline:** In this study, knowledge for nursing care to transplanted patients is mapped, in which a care practice based on scientific evidence, quality, and safety, is mapped, which allows better decision-making of the nurse. Added to the importance of this theme is the identification of nursing care that permeates the three levels of complexity in health: primary, secondary tertiary, considering the different scenarios of the nursing team's performance. Therefore, it is configured as an instrument that induces co-responsibility and care quality with the objective of continuous improvement of health effects, essential for the maintenance of the graft in the transplanted patient.

## ABSTRACT

**Objectives:** Mapping nursing care in kidney transplant patients. **Materials and method:** A scoping review was conducted according to the recommendations of the Joanna Briggs Institute Reviewers' Manual. Data were collected through 13 national and international databases from December 2020 to January 2021, following scientific rigor in the selection of the material. The pre-selection was made by reading the title, abstract and introductory text in advance; the materials included in this stage were read in full to define the content for the study. **Results:** Fifteen studies were included. Of these, 60% are articles; dissertations, manuals, protocols, guidelines and bulletins

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totaled 40% of the material studied. 86.6% of the material has a quantitative approach. Regarding the methodological design, 73.3% were descriptive/transversal character studies. Regarding the mapping of nursing care, it was possible to divide them into two categories: nursing care after kidney transplantation (immediate, mediated and late) and nursing care after kidney transplantation in primary health/extra-hospital care. **Conclusions:** It is concluded that the study allowed mapping nursing care to kidney transplant patients in the immediate, late and primary health care periods.

**KEYWORDS** (SOURCE: DECS)

Kidney transplantation; nursing; nursing care; postoperative period; review literature as topic.

# *Cuidados de enfermería al paciente trasplantado renal: scoping review\**

## RESUMEN

**Objetivos:** mapear los cuidados de enfermería en pacientes trasplantados renales. **Materiales y método:** *scoping review* conducida conforme las recomendaciones del Joanna Briggs Institute Reviewers' Manual. Se recolectaron los datos por medio de 13 bases de datos nacionales e internacionales de diciembre del 2020 a enero del 2021, siguiendo rigor científico en la selección del material. La preselección se dio mediante lectura previa de título, resumen y texto introductorio; los materiales incluidos en esta etapa se leyeron en la íntegra con el fin de definir el contenido para el estudio. **Resultados:** se incluyeron 15 estudios. De estos, el 60 % es artículo; tesis, manuales, protocolos, directrices y boletines suman 40 % del material estudiado. El 86,6 % del material presenta enfoque cuantitativo. En cuanto al diseño metodológico, el 73,3 % son estudios de tipo descriptivos/transversales. Con relación al mapeo de los cuidados de enfermería, se logró dividirlos en dos categorías: cuidados de enfermería post trasplante renal (inmediato, mediato y tardío) y cuidados de enfermería post trasplante renal en la atención primaria a la salud/extra hospitalaria. **Conclusiones:** se concluye que el estudio permitió mapear los cuidados de enfermería al paciente trasplantado renal en los posoperatorios inmediato, mediato, tardío y en la atención primaria a la salud.

## PALABRAS CLAVE (FUENTE: DECS)

Trasplante de riñón; enfermería; atención de enfermería; periodo posoperatorio; literatura de revisión como asunto.

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\* Este artículo se deriva de la tesis doctoral en construcción titulada "Construcción y validación de una tecnología educativa para el cuidado de enfermería en receptores de trasplante renal", que se presentará al Programa de Posgrado en Enfermería de la Universidade Federal do Rio Grande do Norte, Brasil.

# *Cuidados de enfermagem ao paciente transplantado renal: scoping review\**

## RESUMO

**Objetivos:** mapear os cuidados de enfermagem em pacientes transplantados renais. **Materiais e método:** *scoping review* conduzida conforme as recomendações do Joanna Briggs Institute Reviewers' Manual. Os dados foram coletados por meio de 13 bases de dados nacionais e internacionais de dezembro de 2020 a janeiro de 2021, seguindo rigor científico na seleção do material. A pré-seleção se deu mediante a leitura prévia de título, resumo e texto introdutório; os materiais incluídos nessa etapa foram lidos na íntegra a fim de definir o conteúdo para o estudo. **Resultados:** foram incluídos 15 estudos. Destes, 60 % são artigos; dissertações, manuais, protocolos, diretrizes e boletins somaram 40 % do material estudado. 86,6 % do material apresenta abordagem quantitativa. Quanto ao desenho metodológico, 73,3 % eram estudos de tipo descritivos/transversais. Quanto ao mapeamento dos cuidados de enfermagem, pôde dividi-los em duas categorias: cuidados de enfermagem pós- transplante renal (imediato, mediato e tardio) e cuidados de enfermagem pós- transplante renal na atenção primária à saúde/extra-hospitalar. **Conclusões:** conclui-se que o estudo permitiu mapear os cuidados de enfermagem ao paciente transplantado renal nos pós-operatórios imediato, mediato, tardio e na atenção primária à saúde.

## PALAVRAS-CHAVES (FONTE DECS)

Transplante de rim; enfermagem; cuidado de enfermagem; período pós-operatório; literatura de revisão como assunto.

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\* Este artigo é derivado da tese de doutorado em andamento intitulada "Construção e validação de uma tecnologia educativa para o cuidado de enfermagem em receptores de transplante renal", que será apresentada ao Programa de Pós-Graduação em Enfermagem da Universidade Federal do Rio Grande do Norte, Brasil.

## Introduction

Chronic kidney diseases (CKD) are quickly increasing worldwide and represent important events for public health, as a significant percentage of affected individuals progress to death. Thus, this population demands a health system organized in terms of the appropriate process and structure, so that qualified care occurs, with treatment for such diseases, according to their needs (1).

In the publication of Ordinance 389/2014, which defines the criteria for the organization of the care line of the person with CKD, replacement therapies for kidney function are peritoneal dialysis, hemodialysis and kidney transplantation, when the individual has advanced CKD (2).

Kidney transplantation is a safe and successful surgical strategy consisting of the removal of a healthy kidney from one individual (living or deceased donor) to another (recipient), to maintain lost or ineffective kidney functions. Kidney transplantation, although not the definitive “cure” for the disease, provides, among the therapeutic options, a better quality of life for chronic kidney patients (3-9).

Thus, considering kidney transplantation a substitute therapy, that is, a treatment for CKD, the kidney transplant recipient is still a person living with CKD. Thus, it is necessary to understand that, throughout its treatment, it permeates the three levels of complexity of health care: primary, secondary and tertiary, according to the organization of the care line of the person with CKD. The success of kidney transplantation is directly linked to the health and support network in which the transplanted person is inserted. Thus, during therapy, hospital admissions, high complexity procedures, follow-up of the specialized outpatient clinic and follow-up of primary care in its home location may be necessary (2, 10, 11).

In this perspective, because it is a highly complex treatment, kidney transplantation requires specificities from the nursing team during their care (12-14). For this, nurses must systematize their actions, their care provided and interventions with periodic evaluation of patients. Thus, the health care provided to the transplanted becomes quality and safe care, since this performance is based on scientific evidence (15, 16).

In this sense, the nurse, being the leader of the nursing team, actively participates in all stages of the organ transplantation process, since his activities are broad and specialized, and the

satisfactory evolution of the patient is related to the care provided to him and directly to the technical-scientific quality of the professional nurse. It has the task of coordinating the nursing service, early diagnosing problems, proposing solutions and developing health education activities in daily work focusing on technical-scientific deficiencies (17-23).

When we think of nursing care for transplanted patients, the entire postoperative period stands out until outpatient and home care for graft maintenance (24). It is emphasized that, in this process, health professionals, patients and their families are involved.

It is believed that follow-up should be performed both in primary health care (PHC) and in specialized care. However, it is perceived, in practice, that transplanted patients are followed by PHC from their municipalities in a non-effective way and that many professionals have disabilities regarding the competencies and skills in this theme.

This care, besides being important for the strengthening of PHC and being configured as an instrument that induces co-responsibility and quality to continuously improve health outcomes, is essential for the maintenance of the graft in the transplanted patient, because it allows better adhering to drug treatment as an action to protect health; promotion and prevention actions for diseases such as opportunistic infectious diseases; promotion of sexual health; health recovery actions such as reducing anxiety about doubts and treatment difficulties, and greater emotional support for the user and family involved; health rehabilitation actions (25-27).

Therefore, research on this theme is of great relevance to the health area, especially for nursing because they contribute to the quality of care provided to this patient audience, assistance that is still very specialized and little widespread in undergraduate studies. Thus, it is essential to awaken, in nursing professionals, the care of the transplanted patient at any level of complexity in health.

From the above, the study aims to map nursing care in kidney transplant patients through the scoping review.

## Materials and method

A scoping review was carried out that followed the methodology recommended by the Joanna Briggs Institute (28). This methodological strategy is considered a robust approach to synthesize

the relevant literature on health, being used to answer comprehensive questions and map evidence for practical decision-making and research (29).

To this end, the following steps were performed in the study: 1) elaboration of the guiding question of the scoping review; 2) identification of relevant studies; 3) sorting of studies; 4) analysis of the collected data and 5) treatment, synthesis and presentation of the results.

A protocol was elaborated for the structuring and development of the research, which contained the objective of the study, the research question, the eligibility criteria, the research strategy, the databases used for data collection, the definition of variables for data extraction and how the data would be presented. The entire protocol was based on the parameters of the participants, concept and context (PCC) strategy, in which "P" is population, "C", concept and "C", context. The scoping protocol was registered in the public domain (<https://osf.io>).

Thus, for the study in question, the defined population consisted of patients submitted to kidney transplantation; the concept is related to nursing care in kidney transplant recipients, and the context, to the postoperative period of kidney transplantation in hospitals and PHC. All the results found in the scoping review on the subject were included from the PCC strategy. Thus, the study has as a guiding question to identify which nursing care is described in the national and international literature to patients undergoing kidney transplantation. In addition, it has as inclusion criteria texts available in full - in Portuguese, Spanish and English - and texts that address nursing care in kidney transplant patients.

Initially, the descriptors were identified through the Descriptors in Health Sciences (DeCS) — words in Portuguese — and the Medical Subject Headings (MESH) — terms in English — which make up the mnemonic PCC of this research. They are: (P) kidney transplantation OR (C) nursing OR nursing care AND (C) postoperative period.

The second and third stage of the scoping review that corresponds to the identification and selection of studies that fall under the research occurred from December 2020 to January 2021. PubMed, Cumulative Index of Nursing and Allied Health (CINAHL), Web of Science, Latin American and Caribbean Health Sciences (LILACS) and SciELO databases were performed in the Databases. for the research of studies in the grey literature, such as the-

ses, dissertations, manuals, protocols, guidelines and bulletins, we use the Scientific Repository of Open Access of Portugal (RCAAP), the Thesis Bank of the Coordination for the Improvement of Higher Education Personnel (Capes), to the National ETD Portal, Theses Canada, the National Health Surveillance Agency (ANVISA), the Brazilian Ministry of Health, the Federal Nursing Council, the Brazilian Organ Transplant Association and the Brazilian Society of Nephrology.

As a search strategy used for the research, we have (Kidney Transplantation) OR (Nursing OR Nursing Care) AND (Postoperative Period) for the databases in Portuguese and (Kidney transplantation) OR (Nursing OR Nursing Care) AND (Postoperative Period) for the international databases.

Scientific articles, dissertations, theses, manuals, guidelines, protocols and bulletins were defined as eligibility criteria; published and available in full online; in Portuguese, Spanish and English; and that address nursing care in kidney transplant patients. In turn, they were not included in the editorial scope and experience reports. There was no temporal delimitation in the search performed.

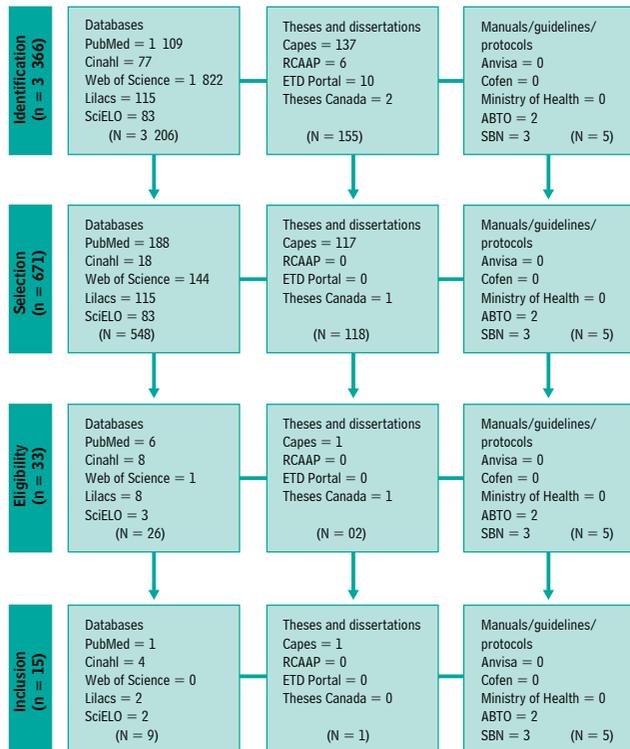
By evaluating the titles and abstracts of the identified studies, the preliminary selection was made. Then, the selected publications were read in full, according to Figure 1. The relevance of the articles for the review was analyzed by two independent reviewers.

The fourth stage of the scoping review aimed at the treatment, synthesis and presentation of the results was performed by collecting the data contained in the publications included in the final sample, in a spreadsheet built-in Microsoft Excel Office 365, with support for the variables listed in the research protocol: type of document, year of publication, journal, country of origin, language, study objective, type of research, study sample, main results about nursing care in kidney transplant patients identified and conclusion of the study.

After data analysis, they were synthesized and presented using tables. To facilitate the understanding and visualization of the data, the studies were coded as follows: "E" (study), followed by Arabic numerals 1, 2, 3, ... 15, to assume representation E1, E2, E3, ... E15.

The level of evidence and the level of recommendation of the studies were classified according to the proposal of the Joanna Briggs Institute (28).

**Figure 1.** Scheme of the study selection process.  
Natal, Brazil, 2021.



Source: Flowchart for the scoping review (adapted from Prisma).

To facilitate the reader's understanding and through the materials selected in the scoping review, nursing care for kidney transplant patients was classified as: nursing care to kidney transplant recipients in the immediate, middle, and late postoperative periods, and nursing care for kidney transplant recipients in PHC.

## Results

The final sample of the scoping review consisted of 15 publications (100%). Among these, there are articles (60 %), manuals (6.6 %), dissertations (6.6 %), protocols (6.6 %), guidelines (13.6 %) and bulletins (6.6 %). Most publications have a quantitative approach (86.6 %); on methodological design, 60% of the studies are descriptive, 13.3 %, transversal character, 6.6 %, observational and 20.1 %, others.

As for the country of origin, 93.3 % of the material comes from Brazilian studies. In view of the sample found, the publications started in 2006 and ended in 2021. Most publications were in 2006, followed by 2007, 2013 and 2016, each year with two publications on the subject, according to Table 1.

Table 2 gathers the main findings, classifying them in nursing care after kidney transplantation (immediate, mediated and late) and PHC.

Among nursing care after kidney transplantation (immediate, mediated, late), the material studied has as main findings to control hemodynamic status, blood pressure, respiratory function and capillary glucose levels; monitor the hydration situation; perform volume replacement, diuresis control every hour; fasting weigh; evaluate abdominal circumference and laboratory results related to fluid retention; monitor systemic signs and symptoms and sites of infection such as the surgical wound; care with an indwelling urinary catheter for the prevention of urinary tract infections; detect early complications related to the surgical procedure; initiate guidance on treatment/follow-up and inform about side effects resulting from immunosuppressive agents or rejection (Table 2).

On the extra-hospital care that also involves PHC, it was identified to encourage healthy habits, such as feeding with less sodium and proteins, with many fibers and fluid intake; guide to avoiding alcohol and smoking, in addition to hygiene care and infection control; guide care with medications and the importance of adhering to the use of medications, especially immunosuppressants; check the vaccine card and guide the one that is up to date; evaluate signs and symptoms suggestive of cytomegalovirus infection, especially in the first three months; evaluate signs and symptoms of chronic rejection (progressive worsening of kidney function, presence of proteinuria, less than 1.0 g/day in 50% of cases); the presence of hypertension (> 90%), as observed in Table 2.

## Discussion

Given the predominance of descriptive studies developed in Brazil, in the final sample of the scoping review, it is evident the need for studies related to this theme focused on clinical practice and with scientific productions with a better level of evidence, making reliable publications that empower the care nurse and assist him in decision making.

**Table 1.** Characterization of the included studies. Natal, Rio Grande do Norte, Brazil, 2021.

Study code (reference)	Study aim	Country (year)	Type of study/ approach/type of publication/level of evidence
E1	Have evidence-based recommendations on Covid-19 vaccination for kidney transplant recipients.	Brazil (2021)	Descriptive/qualitative/ Bulletin/5a
E2	Evaluate the knowledge of nurses in patient care in the immediate postoperative period of kidney transplantation.	Brazil (2020)	Exploratory, descriptive/ qualitative/article/4b
E3	To know the complications that led patients to re-intern in the first year after kidney transplantation and develop strategies to reduce them.	Brazil (2018)	Retrospective/ quantitative/dissertation
E4	Identify the care performed by people with kidney transplantation for the maintenance of the transplanted organ.	Brazil (2017)	Descriptive/qualitative/ article/4b
E5	To recognize the facilities and difficulties that people with CKD experience after kidney transplantation.	Brazil (2016)	Descriptive/qualitative/ article/4b
E6	To analyze the perceptions of transplant patients and health professionals about kidney transplantation.	Brazil (2016)	Exploratory, descriptive/ qualitative/article/4b
E7	Review sorting parameters, prevention and management strategies for diabetes <i>mellitus</i> before and after transplantation.	Brazil (2014)	Descriptive/bibliographic review/article/4a
E8	To analyze the quality of life of people with chronic kidney failure undergoing hemodialysis compared to transplant patients.	Brazil (2013)	Descriptive, cross/ quantitative/article/4b
E9	Clarify the basic doubts that occur in the period after kidney transplantation.	Brazil (2013)	Descriptive/qualitative/ manual/5a
E10	Conduct a bibliographic survey about the role of care and educator of nurses in kidney transplantation.	Brazil (2012)	Descriptive, retrospective/ bibliographic review/ article/4a
E11	Systematize the actions and planning of care provided to patients submitted to kidney transplantation by the nurse professional.	Brazil (2008)	Descriptive/qualitative/ protocol/5a
E12	To identify nursing diagnoses in the immediate postoperative period of patients undergoing kidney transplantation and to raise nursing actions proposed by the Nursing Interventions Classification for nursing diagnoses identified in patients undergoing kidney transplantation.	Brazil (2007)	Descriptive, transversal character/qualitative/ article/4b
E13	Identify nursing care recorded in the medical records of clients in the postoperative period of kidney transplantation; discuss the implications of records for nursing care; evaluate nursing care.	Brazil (2007)	Descriptive/ observational study/ article/4b
E14	To present recommendations for the practice of kidney transplantation, based on evidence published in the literature and clinical experience.	Brazil (2006)	Descriptive/qualitative/ guideline/5a
E15	To present recommendations for the practice of kidney transplantation, based on evidence published in the literature and clinical experience.	Brazil (2006)	Descriptive/qualitative/ guideline/5a

Source: Own elaboration.

**Table 2.** Main nursing care in kidney transplant patients mapped in the scoping review. Natal, Rio Grande do Norte, Brazil, 2021.

Classification of post-kidney transplant nursing care	Main results
Immediate post-operative nursing care	<ul style="list-style-type: none"> <li>• Carrying out the systematization of nursing care (30).</li> <li>• Maintaining bed rest for the first 24 hours and guiding the patient not to exert physical effort (1-5, 15, 22, 23 , 27-32).</li> <li>• Clinical evaluation of the sign and symptoms of sudden anuria, for the prevention of kidney artery thrombosis (29-31).</li> <li>• Monitoring the level of consciousness and cough reflex (30, 33).</li> <li>• Monitoring of systemic signs and symptoms and sites of infection such as the surgical wound (15, 32, 34).</li> <li>• Carrying out medication handling (15, 33).</li> <li>• Control of hemodynamic status, blood pressure, respiratory function and capillary blood glucose levels (31, 33, 35-37).</li> <li>• Monitoring the hydration situation, performing volume replacement, controlling diuresis every hour, weighing in fasting, assessing waist circumference and laboratory results regarding fluid retention (4, 15, 30, 36, 38-40).</li> <li>• Care with an indwelling urinary catheter for the prevention of urinary tract infections (15, 33).</li> <li>• Care with surgical drains (15, 33, 36).</li> <li>• Administration of a light diet after 8 to 12 hours of fasting if clinical conditions exist (15).</li> <li>• Limiting the number of visits (15, 30, 33).</li> </ul>
Immediate post-operative nursing care	<ul style="list-style-type: none"> <li>• Carrying out the systematization of nursing care (30).</li> <li>• Monitoring of systemic signs and symptoms and sites of infection such as the surgical wound (15, 30, 31, 34).</li> <li>• Carrying out medication administration (15, 33).</li> <li>• Control of hemodynamic status, blood pressure, respiratory function and capillary blood glucose levels.</li> <li>• Continuous monitoring of vital signs, patient weight in fasting (4, 15, 16, 30, 38-40).</li> <li>• Recording and evaluation of diet acceptance; maintenance of care with indwelling bladder catheter, with the removal of the bladder catheter on the 4th postoperative day (1, 3).</li> <li>• Monitoring the hydration situation; performing volume replacement; diuresis control every hour; weighs in fasting; evaluation of waist circumference and laboratory results regarding fluid retention (1, 30, 31, 34).</li> <li>• Beginning of guidance on adherence to treatment/follow-up and information on side effects resulting from immunosuppressive agents or rejection (15, 36, 38).</li> <li>• Exercise of the caregiving and educator role (36).</li> <li>• Early detection of complications related to the surgical procedure (33, 36, 37, 39).</li> <li>• Assessment of the presence of hemorrhage, hematomas in the surgical wound and dressing changes (31, 33, 38).</li> <li>• Encouragement to walk as early as possible (33).</li> </ul>
Late postoperative nursing care	<ul style="list-style-type: none"> <li>• Prevention of surgical wound infection and urinary infection, in addition to the removal of surgical stitches (30, 31, 40).</li> <li>• Offering recommendations on the correct use of immunosuppressants and other necessary medications (15, 36, 38).</li> <li>• Guidance on the importance of attending scheduled outpatient appointments; exams scheduled weekly during the first 30 days; monitoring of vital signs, capillary blood glucose; dietary recommendations; regular physical activity; obesity prevention; avoidance of alcohol and tobacco (15, 31, 37).</li> <li>• Exercise of the caregiving and educator role (36).</li> <li>• Advice on staying away from people with contagious diseases or animals and frequent hand washing (40).</li> <li>• Avoidance of lifting heavy objects, pulling or pushing large objects, because between the 6th and 8th week, the surgical wound must heal completely (15, 30).</li> <li>• Clinical evaluation of the emergence of lymphoceles; evaluation for the presence of a palpable mass, hydronephrosis and edema of the lower limb on the transplant side (38).</li> </ul>

Classification of post-kidney transplant nursing care	Main results
Nursing care for kidney transplant recipients in PHC	<ul style="list-style-type: none"> <li>• Regular maintenance of follow-up with consultations by the multidisciplinary team (36, 40).</li> <li>• Exercise of the caregiving and educator role (36).</li> <li>• Encouragement of scheduled exams; monitoring of vital signs; regular physical activity; obesity prevention (36, 40, 41).</li> <li>• Encouraging healthy habits, such as eating less sodium and protein, with lots of fiber and fluid intake (27).</li> <li>• Guidance on avoiding alcohol and smoking, as well as hygiene care and infection control (40).</li> <li>• Guidance on medication care and the importance of adherence to the use of medications, especially immunosuppressants (31, 36, 37, 39, 40).</li> <li>• Guidance on returning to sexual activity and family planning (4, 16).</li> <li>• Avoidance of abdominal exertion and exercises in the first months after surgery (39).</li> <li>• Guidance on the use of sunscreen and avoiding the sun (16, 35).</li> <li>• Monitoring the patient from the beginning of the evolution of their disease to a better quality of life after the procedure (16, 33, 34, 37).</li> <li>• Orientation of the patient to always walk with their identification card about their transplant condition, in addition to their medication (15, 32, 34, 36).</li> <li>• Updated vaccination card — including Covid-19 vaccination (41).</li> <li>• Evaluation of signs and symptoms suggestive of cytomegalovirus infection, especially in the first three months (37).</li> <li>• Evaluation of signs and symptoms of chronic rejection (progressive worsening of kidney function, presence of proteinuria, less than 1.0 g/day in 50% of cases), presence of arterial hypertension (&gt; 90%)(15, 34-36).</li> </ul>

Source: Own elaboration.

Nursing care for kidney transplant patients is essential for the maintenance and preservation of the graft and quality of life of the patient. This care constitutes the basic structure for the patient in the post-transplant period because nursing is the category that is present 24 hours next to the patient during hospitalization and that also monitors and monitors the responses of the organism along with the three levels of health complexity (40).

Research developed on the culture of patient safety in kidney transplantation showed the need for continuous improvement of the nursing professional in the face of theoretical and practical knowledge related to transplantation. It is noteworthy that the nursing professional must be trained and have the skills and competence to assist the transplanted patient to enable safe care for patients and staff, a better quality of care provided, a higher graft survival and better quality of life for kidney transplant recipients (42).

Considering the classification used in the review of the scope in question for nursing care for kidney transplant recipients in the immediate, middle and late postoperative periods, and nursing care for kidney transplant recipients in PHC, results were found for each classification.

For this, nursing care in the immediate postoperative period is vital, being considered a care for critical care. In the first 24

hours after kidney transplantation, nursing actions aim to prevent complications and prioritize the continuous evaluation of general health status with noninvasive monitoring of vital signs and evaluation of the nursing team of 1 hour/1 hour in the first 12 postoperative hours, which allows early and appropriate interventions for each type of worsening. This period of great potential for hemodynamic instability, cardiovascular and neurological complications, important metabolic alterations and the need for replacement of parenteral fluids in large volumes that require intensive care for the maintenance of life (5, 23, 43, 44-49).

The main complications of this period are related to the surgical procedure of kidney transplantation, such as: kidney artery thrombosis, hemorrhage, kidney surgery, urinary obstruction; and non-surgical complications such as acute graft rejection (37, 41). Therefore, the care of the nursing team should be based on clinical evaluation based on physical examination and laboratory tests for monitoring kidney function, pulmonary and cardiovascular function, with emphasis on monitoring the hydroelectrolytic balance and signs and symptoms of kidney injury (5, 23, 33, 50).

Nursing care in the middle postoperative period is a continuity of the surveillance of these patients. The main complications in this period are kidney vein thrombosis, bladder fistula, urinary fistula, kidney hematoma, urinary infection and hypertension.

The emphasis of care in this period is the monitoring of the hydro-electrolytic balance, care for infection prevention, pain control, maintenance and stimulation of pulmonary function, early ambulation, restoration of gastrointestinal functions and restoration of kidney function (37, 51-53).

In this moment of care still in the hospital environment, it is extremely important to create the bond between professionals and the patient, because the longevity of the graft, the quality of life of the recipient and self-care are associated with his/her treatment' and the latter, directly linked to the relationships established throughout the health network. Thus, the professional must establish a dialogical relationship with the client, with a clear language, holistic treatment, individualized, considering their socioeconomic, cultural, religious and cognitive condition (37, 41, 53-58).

How far from the surgical procedure, surgical complications are more difficult to happen, but they may still be present, coming to light, more predominantly, clinical complications (59). Thus, we can say that, in the late postoperative period, the most common complications are lymphocele, urinary infection, cytomegalovirus infection, systemic arterial hypertension, diabetes *mellitus*, rejection of the acute or chronic graft (32, 37, 41, 60 -65).

However, late nursing care is based on the care of the surgical wound, the scores of laboratory results of the general state of health and kidney function, but the care of guidance to the recipient and family members regarding the use of immunosuppressants, the importance of returning to consultations and the performance of scheduled tests, maintenance of dietary recommendations and physical activity, among others (15, 32).

This study highlights the inclusion of nursing care for kidney transplant recipients in PHC. As important as the follow-up of kidney transplant recipients in secondary care, that is, in the specialized outpatient clinic, it is the follow-up of it in PHC in the basic units and in the family health strategy in the municipalities of origin.

It is important to highlight that the kidney transplant patient is still a patient with CKD and should be inserted in the health care network at the three levels of complexity, according to their need.

Published in March 2014, Ordinance 389 defines the criteria for the organization of the care line of the person with CKD. Thus, it is the responsibility of PHC to perform educational activities

and support self-care, expanding the autonomy of the person with CKD, such as stimulating and guiding therapeutic adherence, updating the vaccination card, personal and home hygiene care, and care for the prevention of opportunistic infections due to immunosuppression (2).

It is the responsibility of specialized outpatient care to maintain communication with the multidisciplinary teams of the other components of the Health Care Network (2). This shows that networking among the levels of complexity of care for patients with CKD is extremely important.

Moreover, the potential of studies of this nature is considered by synthesizing and mapping knowledge that ensures a care practice based on scientific evidence and allows decision-making. Added to this theme and the evidence summed up for nursing professionals working with kidney transplant patients in a perspective of guidance and support to safe nursing care practices.

The heterogeneity of the selected studies and even the possibility of vice-studies in individual studies described are uncontrolled characteristics in this type of study and is considered as a limitation of the research. Another limiting feature would be the non-inclusion of material published and available in full in a non-free online medium that could add scientific value to this scoping review. The scarcity of studies focused on nursing care in the international literature was listed as a complicating feature, but not controlled in this type of study.

## Conclusion

It was concluded that the study allowed mapping nursing care to kidney transplant patients in the immediate, immediate, late and PHC postoperative periods.

The mapping of nursing care to kidney transplant recipients provides the strengthening of the care offered in the health care network and is configured as an instrument that induces co-responsibility and quality intending to continuously improve health outcomes. An important driver for the praxis (action-reflection-action) of science and for the valorization of nursing.

Given the complexity that the patient submitted to kidney transplantation presents, it is necessary that the nurse who assists this public be trained to conduct care efficiently in the face of the com-

plex situations resulting from the clinical profile of patients, developing their practice of competent care for safe decision-making, ensuring patient safety and based on scientific evidence.

The insertion of primary health care in the care of kidney transplant patients becomes a differential of this study. In addition, this care is considered essential in the process for graft maintenance

in transplanted patients, as it allows better treatment support, promotion and prevention of diseases such as opportunistic infectious diseases, reduction of anxiety regarding doubts and difficulties of treatment and greater emotional support for the user and the family.

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## References

1. Ruiz-Ortega M, Rayego-Mateos S, Lamas S, Ortiz A, Rodrigues-Diez RR. Targeting the progression of chronic kidney disease. *Nat. Rev. Nephrol.* 2020;16(5):269-88. DOI: <https://doi.org/10.1038/s41581-019-0248-y>
2. Ministério da Saúde do Brasil. Portaria n.º 389, de 13 de março de 2014. 2014. Disponível em: [http://bvsms.saude.gov.br/bvs/saudelegis/gm/2014/prt0389\\_13\\_03\\_2014\\_rep.html](http://bvsms.saude.gov.br/bvs/saudelegis/gm/2014/prt0389_13_03_2014_rep.html)
3. Sallenave MP, Françoso MM, Gusukuma LW, Pestana JOM. Transplantar ou não transplantar. Em: Pestana JOM, Freitas TVS, Silva Junior HT, editores. *Transplante renal: manual prático*. São Paulo: Livraria Balieiro; 2014. p. 3-15.
4. Oliveira FLSO. *Complicações como causas de reinternações no primeiro ano pós-transplante kidney [dissertação]*. Fortaleza: Universidade Federal do Ceará; 2018.
5. Zílio IC, Zanella KA, Marolli C, Souza SS, Silva TG, Araújo BN. Kidney transplantation: Intensive therapeutic nurse in the immediate post-operative. *Rev Pesq.* 2020;12:1144-9. DOI: <https://doi.org/10.9789/2175-5361.rpcfo.v12.8021>
6. Santos FMR. Prevalence and factors associated with non-enrollment for kidney transplant. *Cad Saúde Pública.* 2021;37(6):e00043620. DOI: <https://doi.org/10.1590/0102-311x00043620>
7. Silva GL, Lemos KCR, Barbosa AO, Santos GMR dos. Perception of chronic kidney patients undergoing hemodialysis, about kidney transplantation. *Rev. Enferm. UFPE online.* 2020;14e244498. DOI: <https://doi.org/10.5205/1981-8963.2020.244498>
8. Mesa-Melgarejo L, Carrillo-Algarra AJ, Castiblanco RA, Reina LM, Ávila TM. Terapias de sustitución de la función renal: metaestudio y síntesis de evidencias cualitativas. *Aquichan.* 2017;17(3):328-52. DOI: <https://doi.org/10.5294/aqui.2017.17.3.9>
9. Rocha FL, Echevarría-Guanilo ME, Silva DMGV, Gonçalves N, Lopes SGR, Boell JEW *et al.* Relationship between quality of life, self-esteem and depression in people after kidney transplantation. *Rev. Bras. Enferm.* 2020;73(1):e20180245. DOI: <https://doi.org/10.1590/0034-7167-2018-0245>
10. Daiani GB, Zanesco C, Vanusa MGR, Paula A, Tavares DRS. Apoio familiar no processo de transplante renal. *Rev. Fam., Ciclos Vida Saúde Contexto Soc.* 2018;6(3). Disponível em: <https://www.redalyc.org/articulo.oa?id=497956691003>
11. Tavares MG, Junior HTS, Pestana JOM. Early Hospital Readmission (EHR) in kidney transplantation: A review article. *J. Bras. Nefrol.* 2020;42(2):231-7. DOI: <https://doi.org/10.1590/2175-8239-jbn-2019-0089>
12. Evangelista FVP, Rocha VLC, Barbosa AS, Studart RMB, Bonfin IM, Barbosa IV. Characterization and clinical evolution of transplanted patients of a high complexity postoperative unit. *Rev Enferm. UFPI.* 2018;7(1):4-9. Disponível em: <https://revistas.ufpi.br/index.php/reufpi/article/view/6281/pdf>
13. Cunha Primo HFB, Hayakawa LY. Conhecimento da equipe de enfermagem na assistência ao paciente em pós-operatório de transplante renal. *Rev. Uningá Review.* 2017;29(3). Disponível em: <http://34.233.57.254/index.php/uningareviews/article/view/1975>
14. Quaglio WH, Bueno WMV, Almeida EC. Difficulties faced by nursing teams in the care of transplant patients: Review of integrative literature. *Arq. Cienc. Saúde.* 2017;21(1):53-8. DOI: <https://doi.org/10.25110/arqsaude.v21i1.2017.6076>

15. Associação Brasileira de Transplante de Órgãos (ABTO). Manual de Transplante Renal: período pós-transplante. Barueri: Lopo; 2013
16. Pérez RC, Pérez RE. Aplicación de la terminología NANDA-NOC-NIC en un paciente trasplantado de páncreas riñón. *Enferm. Nefro.* 2016;19(1):87-91. Disponible en: [http://scielo.isciii.es/scielo.php?script=sci\\_arttext&pid=S2254-28842016000100010&lng=es](http://scielo.isciii.es/scielo.php?script=sci_arttext&pid=S2254-28842016000100010&lng=es)
17. Cunha TGS, Lemos KC. Nursing care for kidney transplant phases: An integrative review. *Hrj.* 2020;1(8):26-41. DOI: <https://doi.org/10.51723/hrj.v1i8.143>
18. Silva RAR, Souza NVL, Oliveira SBC, Costa CS, Gonçalves PO, Menezes RM. Preditores para o estabelecimento dos diagnósticos de enfermagem em pacientes transplantados renais. *Rev Cubana Enfermer.* 2018;34(2):e1360. Disponível em: [http://scielo.sld.cu/scielo.php?script=sci\\_arttext&pid=S0864-0319201800020000](http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S0864-0319201800020000)
19. Faraldo CA, Ibáñez RM, Río RM, Esteban PC, Lope AT, Muñoz JD. Frecuencia de los diagnósticos de enfermería en el primer ingreso del paciente con un trasplante renal reciente. *Enferm Nefrol.* 2017;20(1):76-81. Disponible en: [http://scielo.isciii.es/scielo.php?script=sci\\_arttext&pid=S2254-28842017000100010&lng=es](http://scielo.isciii.es/scielo.php?script=sci_arttext&pid=S2254-28842017000100010&lng=es)
20. Rodríguez CRD. Necesidad de mejoras en la comunicación y educación sanitaria del paciente receptor de trasplante renal. *Rev Cubana Enfermer.* 2016;32(3). Disponible en: [http://scielo.sld.cu/scielo.php?script=sci\\_arttext&pid=S0864-03192016000300002&lng=es](http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S0864-03192016000300002&lng=es)
21. Câmara JJCC, Queiroz PL, Santana MAS, Paiva SSP. Strategies implemented by nurses for learning kidney transplant immunosuppression. *Cienc. Cuid. Saude.* 2016;15(2):282-7. DOI: <https://doi.org/10.4025/cienccuidsaude.v15i2.28502>
22. Cordeiro JABL, Brasil VV, Silva AMTC, Oliveira LMAC, Zatta LT, Silva ACCM. Quality of life and hemodialytical treatment: Renal insufficiency patient evaluation. *Rev. Eletr. Enf.* 2009;11(4):785-93. DOI: <https://doi.org/10.5216/ree.v11i4.33224>
23. Marques RVS, Freitas VL. Importance of nursing care in renal transplanted patient care. *Rev. Enferm. UFPE online.* 2018;12(12):3436-44. DOI: <https://doi.org/10.5205/1981-8963-v12i12a237692p3436-3444-2018>
24. Dâmaso AG, Santos CS, Bezerra ASCE. Assistência de enfermagem nos cuidados perioperatórios de pacientes em transplante renal. *CBioS,* 2017;4(2):271.
25. Leite RF *et al.* Medición de la adhesión a los medicamentos inmunosupresores en receptores de trasplante renal. *Acta Paulista Enferm.* 2018;31(5):489-96. DOI: <https://doi.org/10.1590/1982-0194201800069>
26. Gonçalves P, Loureiro L, Fernandes M. Sexual function of kidney transplant recipients. *Rev Enferm Referência.* 2019;21:47-58. *Rev. Enferm. Referência.* DOI: <https://doi.org/10.12707/RIV19009>
27. Ministério da Saúde do Brasil. Portaria n.º 4.279, de 30 de dezembro de 2010. Disponível em: [http://bvsms.saude.gov.br/bvs/saudelegis/gm/2010/prt4279\\_30\\_12\\_2010.html](http://bvsms.saude.gov.br/bvs/saudelegis/gm/2010/prt4279_30_12_2010.html)
28. Peters MDJ, Godfrey C, Mcinerney P, Baldini SC, Khalil H, Parker D. Scoping reviews. Em: Aromataris E, Munn Z, editores. *Joanna Briggs Institute Reviewer's Manual.* The Joanna Briggs Institute, 2017. Available from: <https://reviewersmanual.joannabriggs.org/>
29. Filho VCB, Tricco AC. Scoping review: A relevant methodological approach for knowledge synthesis in Brazil's health literature. *Rev Bras Ativ.&S.* 2019;24(0082):1-3. DOI: <https://doi.org/10.12820/rbafs.24e0082>
30. Luvisotto MM, Carvalho RGL, Galdeano LE. Renal transplantation: diagnosis and nursing intervention in patients during immediate postoperative period. *Einstein.* 2007;5(2):117-22. DOI: <http://apps.einstein.br/revista/arquivos/pdf/441-117-122.original-renal.5.2.1.pdf>
31. Roque KE, Melo ECP, Tonini T. Post operation of renal transplant: Evaluating the care and the nursing care record. *Esc. Anna Nery.* 2007;11(3):409-16. DOI: <https://doi.org/10.1590/S1414-81452007000300003>
32. Santos BPD, Lise F, Feijó AM, Garcia RP, Schwartz E. Cuidados realizados pelas pessoas com transplante renal para a manutenção do órgão. *Rev. Enferm. UFPE.* 2017;11(8):3108-21. Disponível em: <https://pesquisa.bvsalud.org/portal/resource/pt/bde-32535>
33. Associação Brasileira de Transplante de Órgãos (ABTO). Assistência de enfermagem ao paciente submetido ao transplante renal. Protocolo de cuidados de enfermagem em Transplante de Órgãos; 2008.

34. Santos BPD, Viegas AC, Feijó AM, Lise F, Schwartz E. Foi/não foi tudo o que pensava: facilidades e dificuldades após o transplante renal. *Rev Gaúcha Enferm.* 2016;37(3):e60135. DOI: <https://doi.org/10.1590/1983-1447.2016.03.60135>
35. Magalhães ACL, Coelho GD, Azevedo MA, Lazzari DD, Jung W. Quality of life of patients with chronic renal failure hemodialysis — To kidney transplant. *Rev enferm UFPE.* 2013;7(9):5442-52. Available from: <https://periodicos.ufpe.br/revistas/revistaenfermagem/article/view/11828/>
36. Novaes GC. El enfermero asistencial y educador en una unidad de trasplante renal: un desafio. *Enferm Glob.* 2012;11(3):346-50. DOI: <https://doi.org/10.6018/eglobal.11.3.155241>
37. Sociedade Brasileira de Nefrologia (SBN). Transplante renal: complicações não-cirúrgicas. Projeto Diretrizes; 2006.
38. Associação Brasileira de Transplante de Órgãos (ABTO). Transplante renal: complicações cirúrgicas. Projeto. Diretrizes; 2006.
39. Khong MJ, Chong CP. Prevention and management of new-onset diabetes mellitus in kidney transplantation. *Neth J Med.* 2014;72(3):127-34. Available from: <https://njmonline.nl/cntpdf.php?t=i&id=171#page=14>
40. Prates DS, Camponogara S, Arboit ÉL, Tolfo F, Beuter M. Kidney transplant: Perceptions from patients and healthcare professionals about kidney transplants. *Rev enferm UFPE online.* 2016;10(4):1264-72. Available from: <https://periodicos.ufpe.br/revistas/revistaenfermagem/article/view/11112/>
41. Sociedade Brasileira de Nefrologia (SBN). Recomendação para vacinação dos transplantados contra a covid-19; 2021.
42. Pavan NF, Magalhães AL, Poncio DF, Ascari RA, Zanini PD, Knihs NS, Silva OM. Cultura de seguridad del paciente en el trasplante renal en el oeste de Santa Catarina. *Acta Paul Enferm.* 2019;32(4):398-405. DOI: <https://doi.org/10.1590/1982-0194201900055>
43. Pedroso JL, Dutra LA, Braga-Neto P, Abrahao A, Andrade JBC, Silva GL *et al.* Neurological complications of solid organ transplantation. *Arq. Neuro-Psiquiatr.* 2017;75(10):736-47. DOI: <https://doi.org/10.1590/0004-282x20170132>
44. Silva G, Santos L, Silva A, Ramos I, Bonfim I, Studart R. Sistematização da assistência de enfermagem no pós-operatório de transplante renal pediátrico. *Enfermagem em Foco.* 2020;11(1). DOI: <https://doi.org/10.21675/2357-707X.2020.v11.n1.2534>
45. Haberal M, Boyvat F, Akdur A, Kýrnap M, Özcelik U, Karakayalý FY. Surgical Complications After Kidney Transplantation. *Exp Clin Transplant.* 2016;6:587-95. DOI: <https://doi.org/10.6002/ect.2016.0290>
46. Santos MM *et al.* Frailty predicts surgical complications after kidney transplantation. A propensity score matched study. *PLoS ONE.* 2020;15(2):e0229531. DOI: <https://doi.org/10.1371/journal.pone.0229531>
47. Warzyszyńska K, Zawistowski M, Karpeta E, Ostaszewska A, Jonas M, Kosieradzki M. Early postoperative complications and outcomes of kidney transplantation in moderately obese patients. *Transplantation Proceedings.* 2020;52(8):2318-23. DOI: <https://doi.org/10.1016/j.transproceed.2020.02.110>
48. Drüeke TB, Evenepoel P. The bone after kidney transplantation. *Clin J Am Soc Nephrol.* 2019;14(6):795-7. DOI: <https://doi.org/10.2215/CJN.04940419>
49. Rodrigues-Filho EM, Garcez A. APACHE IV score in postoperative kidney transplantation. *Rev Bras Ter Intensiva.* 2018;30(2):181-6. DOI: <https://doi.org/10.5935/0103-507X.20180032>
50. Gallego E *et al.* Donante renal: vivencia del proceso. *Enf Uro.* 2019;136:14-8. Disponible en: [http://revistas-enfuro.enfuro.es/html/revista\\_136.html#./images/revista136/2](http://revistas-enfuro.enfuro.es/html/revista_136.html#./images/revista136/2)
51. Cunha NC *et al.* Prevalence of urinary tract infection in the first month after kidney transplant at a university hospital. *Rev Enferm UERJ.* 2017;25:1-1, 30. DOI: <https://doi.org/10.12957/reuerj.2017.26479>
52. Tran A, Miniard J. Preventing infections after renal transplant, *Nursing.* 2017;47(1):57-60. DOI: <https://doi.org/10.1097/01.NURSE.0000502757.64064.76>
53. Santos BP, Farias JS, Farias L, Feijó AM, Viegas AC, Schwartz E. Utilization of immunosuppressants by people with renal transplant. *Rev Fun Care Online.* 2017;9(4):1145-53. DOI: <https://doi.org/10.9789/2175-5361.2017.v9i4.1145-1153>

54. Júnior EVS, Boery R, Boery EN. Avaliação da qualidade de vida dos pacientes submetidos ao transplante renal. *Rev Saúde Desenv.* 2017;11(7):123-9. Disponível em: [https://www.researchgate.net/profile/Edison-Souza-Junior/publication/334454807\\_Evaluation\\_of\\_the\\_quality\\_of\\_life\\_of\\_the\\_patients\\_undergoing\\_kidney\\_transplantation/links/5d2ba19c299bf1547cb7cf08/Evaluation-of-the-quality-of-life-of-the-patients-undergoing-kidney-transplantation.pdf](https://www.researchgate.net/profile/Edison-Souza-Junior/publication/334454807_Evaluation_of_the_quality_of_life_of_the_patients_undergoing_kidney_transplantation/links/5d2ba19c299bf1547cb7cf08/Evaluation-of-the-quality-of-life-of-the-patients-undergoing-kidney-transplantation.pdf)
55. Augustine J. Kidney transplant: New opportunities and challenges. *Clevel. Clin. J. Med.* 2018; 85(2):138-44. DOI: <https://doi.org/10.3949/ccjm.85gr.18001>
56. Doalto MY, Cruz VR, Carretón MML. Factores asociados a la resiliencia y adherencia terapéutica en pacientes con injerto renal funcionante. *Enferm. Nefrol [internet]*. 2018;21(2):123-9. DOI: <https://doi.org/10.4321/S2254-28842018000200003>
57. Tan L, Tang Y, Peng W, Mathew BS, Qin W. Combined immunosuppressive treatment may improve short-term renal outcomes in Chinese patients with advanced IgA nephropathy. *Kidney and Blood Pressure Research.* 2018;43(4):1333-43. DOI: <https://doi.org/10.1159/000492592>
58. Gonzalez MLS, Thongprayoon C, Hansrivijit P, Kovvuru K, Kanduri SR, Aeddula NR *et al.* Treatment of C3 glomerulopathy in adult kidney transplant recipients: A systematic review. *Medical Sciences.* 2020;8(4):44. DOI: <https://doi.org/10.3390/medsci8040044>
59. Souza TL, Trindade TRO, Mendonça AEO, Silva RAR. Necessidades humanas básicas alteradas em pacientes pós-transplante renal: estudo transversal. *OBJ Nursing.* 2016;15(2):1. DOI: <https://doi.org/10.17665/1676-4285.20165253>
60. Hecking M, Sharif A, Eller K, Jenssen T. Management of post-transplant diabetes: Immunosuppression, early prevention, and novel antidiabetics. *Transplant International.* 2020;34(1):27-48. DOI: <https://doi.org/10.1111/tri.13783>
61. Sevmis M, Aktas S, Alkara U, Kilercik H, Uyar M, Sevmis S. Risk factors, diagnosis, and treatment of lymphocele after renal transplantation: A retrospective study. *Transplantation Proceedings.* 2021;53(53):1040-7. DOI: <https://doi.org/10.1016/j.transproceed.2021.01.028>
62. Rysz J, Franczyk B, Radek M, Ciałkowska-rysz A, Gluba-brzózka A. Diabetes and cardiovascular risk in renal transplant patients. *Int. J. Mol. Sci.* 2021;22(7):3422. DOI: <https://doi.org/10.3390/ijms22073422>
63. Ponticelli C, Favi E, Ferraresso M. New-Onset diabetes after kidney transplantation. *Medicina.* 2021;57(3):250. DOI: <https://doi.org/10.3390/medicina57030250>
64. Bach PA, Martínez SA, Martínez DY, Sobrado SO, Redondo PMD, Junyent IE. Obesidad, diabetes y trasplante. *Enferm Nefrol.* 2017;20(1):82-7. Disponible en: [http://scielo.isciii.es/scielo.php?script=sci\\_arttext&pid=S2254-28842017000100011&lng=es](http://scielo.isciii.es/scielo.php?script=sci_arttext&pid=S2254-28842017000100011&lng=es)
65. Kinnunen S, Karhapää P, Juutilainen A, Finne P, Helanterä I. Secular trends in infection-related mortality after kidney transplantation. *Clin J Am Soc Nephrol.* 2018;13:755-62. DOI: <https://doi.org/10.2215/CJN.11511017>