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## Abstract

To analyze the knowledge and safety of primary health care professionals in the management of chronic kidney disease in its early stages. Integrative literature review carried out in four steps. The search took place in the following databases: MEDLINE via PubMed, Web of Science, Scopus and BVS. The descriptors used were “Primary Health Care” AND “Kidney Diseases” AND “Health Knowledge, Attitudes, Practice” and the quality of the analysis was checked by means of the *Hierarchy of Evidence for Intervention Studies*. Fifteen articles were found, with a predominance of qualitative and descriptive method; the results showed insufficient knowledge of health professionals and interest in the best approach in the initial stage of the disease. Thus, it is inferred that the knowledge and security of primary health care professionals depend on individual factors and institutional initiative for the adoption of clinical guidelines and training. Therefore, prepared professionals and organized care, using protocols, would bring benefits both to patients as to the evolution and outcome of the disease and savings to health services.

**Keywords:** Primary health care. Renal insufficiency chronic. Review. Safety. Surveys and questionnaires.

## 1. Introduction

Chronic kidney disease (CKD) has a slow onset and, as it is progressive in severity due to permanent kidney damage, can and should be managed in primary health care (PHC) (Hill et al. 2016; Silva et al. 2020). The prevalence of CKD is 10% to 15% in the world population, and appropriate interventions need to be started early to delay the disease's worsening (Hill et al. 2016; Levin et al. 2017). Therefore, assistance by professionals such as family physicians, nurses and staff at the first level of care is essential (Hill et al. 2016; Nash et al. 2017).

Different situations can affect the quality of CKD treatment in PHC, including decision-making based on previous experiences, lack of knowledge about the disease itself and its serious consequences, which can accelerate permanent kidney damage. The Improving Global Outcomes Kidney Disease (KDIGO) updated international guidelines in 2012 for the assessment and management of kidney disease (Vassalotti et al. 2016). In 2013, the same institution published multidisciplinary guidelines and defined a classification system with clinical approaches for each phase of CKD (Inker et al. 2014).

In this classification system, chronic diseases such as systemic arterial hypertension (SAH) and Diabetes Mellitus (DM) are considered as triggers for CKD (Levin et al. 2017). Studies provide evidence of

the success of proper management initiated in PHC, but also point to obstacles that make it difficult to provide correct healthcare for patients (Paula et al. 2016; Arantes et al. 2016; Alves et al. 2017).

In the current situation of pandemic caused by COVID-19, there may be losses in the maintenance of treatments for chronic health conditions, with lapses that tend to accelerate the progression of CKD (Sarti et al. 2020). It is observed that the costs are higher for health systems when the disease needs to be treated in medium and high complexity services, especially with the use of renal replacement therapy (RRT) (Alcalde and Kirsztajn 2018).

Aware that CKD may result from SAH and DM, the management of these diseases in PHC has a great impact on related morbidity and mortality. This study was designed to synthesize the scientific literature as to evidence about the knowledge and safety of PHC health professionals in the management of patients with early-stage CKD.

## 2. Material and Methods

This is an integrative literature review to analyze the knowledge and safety of PHC professionals in the management of CKD in its early stages.

This study was developed with a careful method in which the steps for identifying the problem were followed; elaboration of the guiding question; literature search; data collection by means of a structured instrument; analysis of data and presentation of the review with dissemination of results (Stillwell et al. 2010; Melnyk et al. 2010).

Data collection took place from May to July 2020, with a structured protocol. The PICO acronym was used, in which P (population of interest) comprised PHC professionals; I (intervention) referred to early-stage CKD management; C (control or comparison) was not applicable; and O (outcome) involved knowledge and security. Thus, the guiding question defined was: Do PHC professionals have knowledge and security regarding the management of CKD at an early stage?

Searches were performed in MEDLINE databases via PubMed, Scopus; Web of Science and Virtual Health Library (VHL), and also manual searches in article references. The search strategy used the words in English: "Primary Health Care", "Kidney Diseases", "Health Knowledge, Attitudes, Practice", indexed in the Medical Subject Headings (MeSH). Search details are described in Table 1.

**Table 1.** Database search strategies and number of findings, Brazil, 2020.

Database	Search strategy	Results
PubMed	1# ("Primary Health Care"[Mesh]) AND "Kidney Diseases"[Mesh]) AND "Health Knowledge, Attitudes, Practice"[Mesh]	27
Web of Science	1# TS=(Primary Health Care AND Kidney Diseases AND Health Knowledge, Attitudes, Practice)	6
Scopus	1# (Primary Health Care)AND("Kidney Diseases)AND("Health Knowledge, Attitudes, Practice)AND(LIMIT-O(PUBYEAR,2020)ORLIMIT-TO(PUBYEAR,2019)ORLIMIT-O(PUBYEAR,2018)ORLIMIT-TO(PUBYEAR,2017)ORLIMIT-TO(PUBYEAR,2016)ORLIMIT-O(PUBYEAR,2015)ORLIMIT-TO(PUBYEAR,2014)ORLIMITTO(PUBYEAR,2013))AND(LIMIT-TO(DOCTYPE,"ar))	38
BVS	1# (tw:(Primary Health Care)) AND (tw:(Kidney Diseases)) AND (tw:(Health Knowledge, Attitudes, Practice))	44
	Manual Search	03

The following inclusion criterion was adopted: the limitation of time for articles published in the last seven years (January 2013 to June 2020) because of the updates of the Guidelines on CKD, with a view to studies that evaluated the knowledge of professionals about CKD in early stages in the context of PHC, noting that articles could be published in any language. Publications investigating CKD from stage 3b, RRT,

transplantation, diagnoses, acute renal failure, as well as letters to the editor, editorials, expert opinions, and reviews were excluded.

The studies were included after pre-screening, with assessments made independently by two researchers, and differences were examined by a third researcher. The removal of duplicates occurred using Mendeley with export of selected articles for reading the title and abstract in Rayyan QCRI Software (Ouzzani et al. 2016).

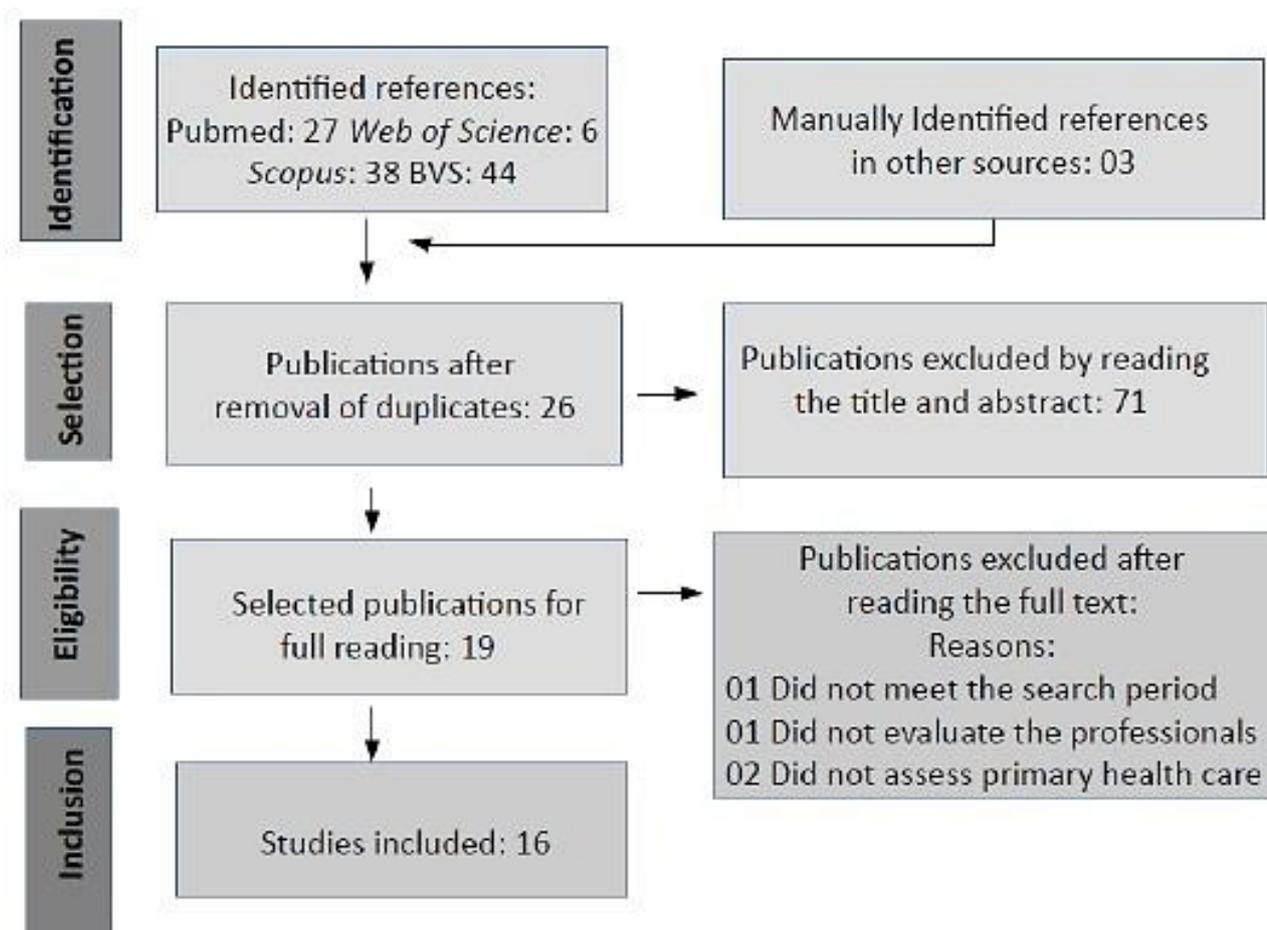
After selecting the articles, the full reading and extraction of data and essential variables in a LibreOffice Calc 5.0 4.2, 2015 spreadsheet took place, according to the Critical Evidence Assessment: Part I (Finetou-Oberholt et al. 2010).

To analyze the methodological quality of the studies, the Hierarchy of Evidence for Intervention Studies was used, with seven levels of evidence: Level I – Systematic review of meta-analyses; Level II – Randomized controlled trials; Level III – Controlled trials without randomization; Level IV - Case Control or Cohort Study; Level V – Systematic review of qualitative or descriptive studies; Level VI – qualitative or descriptive study; Level VII – expert opinion or consensus (Melnik et al. 2010).

The results were synthesized and grouped for the evaluation and interpretation of the findings resulting from the articles in a descriptive and qualitative way.

### 3. Results

The searches in the databases resulted in 115 studies, and three were included by manual searches, totaling 118; 26 duplicates were removed and, after peer review, 73 had not met the inclusion criteria; thus, 19 went on to full reading, from which three were excluded. The final analysis was performed on 16 articles that address the proposed theme (Figure 1).



**Figure 1.** Study selection flowchart relation to knowledge and safety of primary health care professionals in the management of chronic kidney disease in its early stages, Brazil 2020, elaborated from the PRISMA recommendation.

Table 2 refers to data regarding the identification of the articles included, such as title, year, country, design/number of participants, interventions, outcomes, and level of evidence.

The predominant language in the articles published was English. The longest period in which publications occurred were in the years 2013 and 2016, (N = 3) in both, and in the year 2018 (N = 4), which corresponds to 43.7% of the articles found.

The countries of origin of the surveys analyzed were: Australia (N=3) (Clement Lo et al. 2016; Sinclair et al. 2017; Sinclair et al. 2019); the United States of America (N=3) (Vest et al. 2015; Haley et al. 2015; Sequist et al. 2018); the Netherlands (N=2) (van Gelder et al. 2016; van Dipten et al. 2018); Canada (N=2) (Pang et al. 2016; Nash et al. 2017); and one article for each of the countries: Israel, Taiwan, Cameroon, Nigeria, England and Pakistan (Huang et al. 2013; Yaqub et al. 2013; Eilat-Tsanani et al. 2014; Choukem et al. 2016; Pang et al. 2016; Simmonds et al. 2016; Adejumo et al. 2018).

As for the methodological design, articles with qualitative methods predominated (13 altogether), classified as Evidence Level VI: (Yaqub et al. 2013; Eilat-Tsanani et al. 2014; Vest et al. 2015; Haley et al. 2015; Van Gelder et al. 2016; Choukem et al. 2016; Clement Lo et al. 2016; Pang et al. 2016; Simmonds et al. 2016; Sinclair et al. 2017; Adejumo et al. 2018; Nash et al. 2017; van Dipten et al. 2018). Only two articles were from randomized clinical trials, with level of evidence II (Sequist et al. 2018; Sinclair et al. 2019); and one article was an observational cohort with level of evidence IV (Huang et al. 2013).

The professionals who follow the study populations were physicians and nurses, with great variation in the size of the population samples.

**Table 2.** Characterization of the articles included in the review of knowledge and safety of primary health care professionals for the management of chronic kidney disease at an early stage, Brazil, 2020.

Title (*) or reference	Year/ Country	Outline/ number of patients	Interventions	Outcomes	NE
<i>General practitioners' knowledge and approach to chronic kidney disease in Karachi, Pakistan</i>	Yaqub, 2013 Pakistan	Cross-sectional study N=232	CKD management in pre-dialysis care.	Knowledge gaps and approach to diagnosis and treatment.	VI
<i>Estimating the influence of physicians on the underuse of drugs in diabetic nephropathy in Taiwan</i>	Huang, 2013 Taiwan	Retrospective Cohort N=2960 physicians	Prescriptions of IECA or BRA.	Prescription level, with registers of predictors in medical records.	IV
<i>Management of kidney disease in patients with diabetes in the primary care setting</i>	Eilat-Tsanani, 2014 Israel	Observational study N= 169	Activities carried out and gaps in care for diabetes and CKD3.	Performance and quality for care in initial CKD.	VI
<i>Chronic Kidney Disease Guideline Implementation in Primary Care: a Qualitative Report from the TRANSLATE CKD Study</i>	Vest, 2015 United States	study of mixed methods N= 27 physicians	Evidence-based guidelines for CKD.	Knowledge and related issues.	IV
<i>Improving care coordination between nephrology and primary care: a quality improvement initiative using the renal physicians association toolkit</i>	Haley, 2015 United States	Cross-sectional study N= 10	Quality based on nephrology practices	Application of supporting tools.	VI
<i>Quality of chronic kidney disease management in primary care: a retrospective study</i>	Van Gelder, 2016 Netherlands	Retrospective Study N=207.469	Interdisciplinary guidelines for CKD.	Quality in care.	VI
<i>Knowledge of physicians on chronic kidney disease and their attitudes towards referral, in two cities of Cameroon: a cross-sectional study</i>	Choukem, 2016 Cameroon	Cross-sectional study N= 114	CKD and referral to the specialist.	General knowledge and developed practices.	VI

**Table 2.** Continued.

<i>Identifying health service barriers in the management of co-morbid diabetes and chronic kidney disease in primary care: a mixed-methods exploration</i>	Lo Clement, 2016 Australia	Study of mixed methods N= 22	Diabetes and CKD management.	General knowledge and developed practices.	IV
<i>Evaluation of a mentorship program to support chronic kidney disease care</i>	Pang, 2016 Canada	Qualitative study N= 161	Mentoring for primary care providers.	Knowledge, access and satisfaction.	VI
<i>Understanding tensions and identifying clinician agreement on improvements to early-stage chronic kidney disease monitoring in primary care: a qualitative study</i>	Simmonds, 2016 England	Qualitative study N= 26	Early stage CKD monitoring.	General knowledge and developed practices.	VI
<i>Barriers and facilitators to opportunistic chronic kidney disease screening by general practice nurses</i>	Sinclair, 2017 Australia	Qualitative study N= 26	CKD tracking.	Detection and management of cases.	VI
<i>Primary care provider perceptions of enablers and barriers to following guideline recommended laboratory tests to confirm chronic kidney disease: a qualitative descriptive study</i>	Nash, 2017 Canada	Qualitative study N= 13	CKD marker tracking.	Facilitators and barriers to request serum creatinine.	
<i>Assessment of knowledge of chronic kidney disease among non-nephrology nurses in Akure, South-West Nigeria</i>	Adejumo, 2018 Nigeria	Cross-sectional study N=100	Knowledge of CKD.	Knowledge level.	VI
<i>General practitioners' perspectives on management of early-stage chronic kidney disease: a focus group study</i>	Van Dipten, 2018 Netherlands	Qualitative study N= 27	Knowledge and perspectives on early CKD.	Individual perception and understanding.	VI
<i>Physician and patient tools to improve chronic kidney disease care</i>	Sequist, 2018 EUA	Randomized Controlled Trial N=7844	Dissemination of information on CKD.	Awareness and quality.	II
<i>The CKD-DETECT study: an RCT aimed at improving intention to initiate a kidney health check in Australian practice nurses</i>	Sinclair, 2019 Australia	Randomized controlled trial N= 212	Web e-learning for screening in CKD.	Behavior and management.	II

#### 4. Discussion

The findings of this review revealed that there was no exponential increase in publications related to the knowledge and safety of PHC professionals from 2013 to the present date, even with evidence of large proportion of harm to patients, widespread population involvement, and exacerbated health costs for developed and developing countries (Hill et al. 2016; Lima et al. 2020b).

Articles based on qualitative methods predominated. The studies sought to understand, interpret, explain data, indicators and trends present in studies on the relationships, beliefs, perceptions, and opinions that subjects reproduce in their lives (Yaquob et al. 2013; Huang et al. 2013).

The countries that published the most were: the United States of America (Vest et al. 2015; Haley et al. 2015; Sequist et al. 2018) and Australia (Clement Lo et al. 2016; Sinclair et al. 2017; Sinclair et al. 2019). It was observed that these countries have structured actions in relation to specific public policies for CKD.

The studies evidenced the interest of PHC professionals in recognizing and safely managing patients in the early stages of CKD, as they showed barriers in relation to structure, human resources, task definition, knowledge of guidelines and referral to perform the appropriate treatment (Sinclair et al. 2017; Nash et al. 2017; van Dipten et al. 2018; Sinclair et al. 2019).

Identification, preventive and self-care measures aimed at CKD are necessary for the safe and effective practice of professionals for patients (Pereira et al. 2015; Levin et al. 2017). Approaches in Telemedicine demonstrate good opportunities to expand care, reduce costs, teach professionals and patients with a view to quality and safety in care (Fernandes et al. 2015).

Canadian quality indicators for the management of CKD in PHC found that there was no heterogeneity in the quality of care, even with well-applied guidelines, monitoring, albuminuria testing and use of recommended medications (Bello et al. 2019). However, given the current context of COVID 19 pandemic, adaptations of protocols for PHC professionals in Canada were made, which enabled professional categories to carry out prescriptions, as well as to ensure treatment of chronic diseases (Canada of Government, 2020). This situation shows how essential safe work practices are in favor of resolute actions for communities (Harzheim et al. 2020; Bárcena and Eitienne 2020).

Although PHC professionals are ideally suited to identify and manage CKD in its early stages, there is still low understanding, awareness, and management in this area, pointing to the need to address barriers that limit the quality of care at local levels (Huang et al. 2013; Vest et al. 2015; Sinclair et al. 2017; Sinclair et al. 2019).

Better results can come with factors such as increased understanding of CKD screening practices, the concept of a holistic approach of the guidelines, integration into cardiovascular programs, better access to specialized services, and coordination of care (Sinclair et al. 2017; van Dipten, et al. 2018; Sequist et al. 2018).

The low knowledge in CKD stands for a paradox that draws attention: despite international clinical guidelines and wide dissemination, there are gaps between the guidance and the practice exerted by general practitioners, which is important for the inclusion of these workers' learning needs (Yaqub et al. 2013; Haley et al. 2015; Clement Lo et al. 2016).

In the analyzed articles, there was no discussion regarding the multidisciplinary work in the care of patients with early CKD. The role of the generalist nurse was listed in some studies (N=05), highlighting the importance of this professional for nephrology care at primary, secondary and tertiary levels (Lo Clement et al. 2016; Simmonds et al. 2016; Sinclair et al. 2017; Nash et al. 2017; Adejumo et al. 2018; Sinclair et al. 2019). However, most articles (N=10) analyzed the evidence of management by the general practitioner or the patient's family (Yaqub et al. 2013; Huang et al. 2013; Eilat-Tsanani et al. 2014; Vest et al. 2015; Haley et al. 2015; Van Gelder et al. 2016; Choukem et al. 2016; Pang et al. 2016; Van Dipten et al. 2018; Sequist et al. 2018).

Even so, it is observed that the Improving Global Outcomes Kidney Disease (KDIGO) updated the international guidelines for the assessment and management of kidney diseases, publishing multidisciplinary guidelines that clarified the definition and classification system and guidelines for appropriate clinical practices (Inker et al. 2014).

It is worth emphasizing that the work of the multidisciplinary team, such as physicians, nurses, nutritionists, psychologists, pharmacists, and humanities professionals, should be valued in PHC (Schneider et al. 2018; Lima et al. 2020a; Lima et al. 2020b).

The included studies did not show the holistic approach to patients, however, research with PHC nurses reported their concern to be accurate as to the correct management focused on each individual (Sinclair et al. 2017; Adejumo et al. 2018; van Dipten et al. al. 2018; Sinclair et al. 2019). For this purpose, the singularities of the patient, family and community must be considered; with an appreciation of dialogue. Correlating health and culture is essential in protection policies that fulfill basic human rights, as

they address the social determinants of health, well-being and equality (Costa et al. 2019; Peruzzo et al. 2020).

It is extremely important to strengthen the care of CKD patients at an early stage, since in advanced phases of the disease, especially in terminal ones, the cost for health systems is very high, therefore, public policies aimed at this specific audience are important to ensure early care (Alcalde and Kirsztajn 2018).

Given the polarization between saving lives and minimizing the financial impacts resulting from the COVID-19 pandemic, the probability of a humanitarian and economic crisis in the coming years has increased. Then it is necessary for the PHC to be a pillar in this organization (Sarti et al. 2020). Thus, a synergy of coping strategies needs to occur, by means of national plans that combine health and economic and social policies with universal access to essential products and health services (Bárcena and Eitienne, 2020).

As for the limitations of this study, we sought to analyze only the knowledge of professionals who care for patients with CKD, thus highlighting the findings in a qualitative way. Because of the heterogeneity of the data, no quantitative measurements were made; the contributions come from the detailed analysis. This is the only integrative review article that addresses this subject, in a broad way and with methodological rigor, in favor of evidence that may be useful for the scientific community and health services.

## 5. Conclusions

Based on the data obtained, it is possible to infer that PHC professionals have difficulties in identifying and classifying CKD, especially in the early stages, and do not feel safe in performing the clinical management, however, some elements can be facilitating, as these professionals present interest in better understanding the early stages of CKD for a quality care.

There is a need for expanded standardized guidelines with subsidies so that professionals can be able to maintain proper management in PHC. The challenges are numerous to improve the quality of care for kidney disease in PHC, that depend on complex contexts, from management levels to the training of professionals.

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