

# Difusão do Conhecimento Através das Diferentes Áreas da Medicina 2

Lais Daiene Cosmoski  
(Organizadora)



# Difusão do Conhecimento Através das Diferentes Áreas da Medicina 2

Lais Daiene Cosmoski  
(Organizadora)



2019 by Atena Editora  
Copyright © Atena Editora  
Copyright do Texto © 2019 Os Autores  
Copyright da Edição © 2019 Atena Editora  
Editora Chefe: Profª Drª Antonella Carvalho de Oliveira  
Diagramação: Natália Sandrini  
Edição de Arte: Lorena Prestes  
Revisão: Os Autores



Todo o conteúdo deste livro está licenciado sob uma Licença de Atribuição Creative Commons. Atribuição 4.0 Internacional (CC BY 4.0).

O conteúdo dos artigos e seus dados em sua forma, correção e confiabilidade são de responsabilidade exclusiva dos autores. Permitido o download da obra e o compartilhamento desde que sejam atribuídos créditos aos autores, mas sem a possibilidade de alterá-la de nenhuma forma ou utilizá-la para fins comerciais.

### **Conselho Editorial**

#### **Ciências Humanas e Sociais Aplicadas**

Profª Drª Adriana Demite Stephani – Universidade Federal do Tocantins  
Prof. Dr. Álvaro Augusto de Borba Barreto – Universidade Federal de Pelotas  
Prof. Dr. Alexandre Jose Schumacher – Instituto Federal de Educação, Ciência e Tecnologia de Mato Grosso  
Prof. Dr. Antonio Carlos Frasson – Universidade Tecnológica Federal do Paraná  
Prof. Dr. Antonio Gasparetto Júnior – Instituto Federal do Sudeste de Minas Gerais  
Prof. Dr. Antonio Isidro-Filho – Universidade de Brasília  
Prof. Dr. Constantino Ribeiro de Oliveira Junior – Universidade Estadual de Ponta Grossa  
Profª Drª Cristina Gaio – Universidade de Lisboa  
Prof. Dr. Deyvison de Lima Oliveira – Universidade Federal de Rondônia  
Prof. Dr. Edvaldo Antunes de Farias – Universidade Estácio de Sá  
Prof. Dr. Eloi Martins Senhora – Universidade Federal de Roraima  
Prof. Dr. Fabiano Tadeu Grazioli – Universidade Regional Integrada do Alto Uruguai e das Missões  
Prof. Dr. Gilmei Fleck – Universidade Estadual do Oeste do Paraná  
Profª Drª Ivone Goulart Lopes – Istituto Internazionele delle Figlie de Maria Ausiliatrice  
Prof. Dr. Julio Candido de Meirelles Junior – Universidade Federal Fluminense  
Profª Drª Keyla Christina Almeida Portela – Instituto Federal de Educação, Ciência e Tecnologia de Mato Grosso  
Profª Drª Lina Maria Gonçalves – Universidade Federal do Tocantins  
Profª Drª Natiéli Piovesan – Instituto Federal do Rio Grande do Norte  
Prof. Dr. Marcelo Pereira da Silva – Universidade Federal do Maranhão  
Profª Drª Miranilde Oliveira Neves – Instituto de Educação, Ciência e Tecnologia do Pará  
Profª Drª Paola Andressa Scortegagna – Universidade Estadual de Ponta Grossa  
Profª Drª Rita de Cássia da Silva Oliveira – Universidade Estadual de Ponta Grossa  
Profª Drª Sandra Regina Gardacho Pietrobon – Universidade Estadual do Centro-Oeste  
Profª Drª Sheila Marta Carregosa Rocha – Universidade do Estado da Bahia  
Prof. Dr. Rui Maia Diamantino – Universidade Salvador  
Prof. Dr. Urandi João Rodrigues Junior – Universidade Federal do Oeste do Pará  
Profª Drª Vanessa Bordin Viera – Universidade Federal de Campina Grande  
Prof. Dr. Willian Douglas Guilherme – Universidade Federal do Tocantins

#### **Ciências Agrárias e Multidisciplinar**

Prof. Dr. Alexandre Igor Azevedo Pereira – Instituto Federal Goiano  
Prof. Dr. Antonio Pasqualetto – Pontifícia Universidade Católica de Goiás  
Profª Drª Daiane Garabeli Trojan – Universidade Norte do Paraná  
Profª Drª Diocléa Almeida Seabra Silva – Universidade Federal Rural da Amazônia  
Prof. Dr. Écio Souza Diniz – Universidade Federal de Viçosa  
Prof. Dr. Fábio Steiner – Universidade Estadual de Mato Grosso do Sul  
Profª Drª Girlene Santos de Souza – Universidade Federal do Recôncavo da Bahia  
Prof. Dr. Jorge González Aguilera – Universidade Federal de Mato Grosso do Sul  
Prof. Dr. Júlio César Ribeiro – Universidade Federal Rural do Rio de Janeiro  
Profª Drª Raissa Rachel Salustriano da Silva Matos – Universidade Federal do Maranhão  
Prof. Dr. Ronilson Freitas de Souza – Universidade do Estado do Pará  
Prof. Dr. Valdemar Antonio Paffaro Junior – Universidade Federal de Alfenas

### Ciências Biológicas e da Saúde

Prof. Dr. Benedito Rodrigues da Silva Neto – Universidade Federal de Goiás  
Prof. Dr. Edson da Silva – Universidade Federal dos Vales do Jequitinhonha e Mucuri  
Prof<sup>a</sup> Dr<sup>a</sup> Elane Schwinden Prudêncio – Universidade Federal de Santa Catarina  
Prof. Dr. Gianfábio Pimentel Franco – Universidade Federal de Santa Maria  
Prof. Dr. José Max Barbosa de Oliveira Junior – Universidade Federal do Oeste do Pará  
Prof<sup>a</sup> Dr<sup>a</sup> Magnólia de Araújo Campos – Universidade Federal de Campina Grande  
Prof<sup>a</sup> Dr<sup>a</sup> Natiéli Piovesan – Instituto Federal do Rio Grande do Norte  
Prof<sup>a</sup> Dr<sup>a</sup> Vanessa Lima Gonçalves – Universidade Estadual de Ponta Grossa  
Prof<sup>a</sup> Dr<sup>a</sup> Vanessa Bordin Viera – Universidade Federal de Campina Grande

### Ciências Exatas e da Terra e Engenharias

Prof. Dr. Adélio Alcino Sampaio Castro Machado – Universidade do Porto  
Prof. Dr. Alexandre Leite dos Santos Silva – Universidade Federal do Piauí  
Prof<sup>a</sup> Dr<sup>a</sup> Carmen Lúcia Voigt – Universidade Norte do Paraná  
Prof. Dr. Eloi Rufato Junior – Universidade Tecnológica Federal do Paraná  
Prof. Dr. Fabrício Menezes Ramos – Instituto Federal do Pará  
Prof. Dr. Juliano Carlo Rufino de Freitas – Universidade Federal de Campina Grande  
Prof<sup>a</sup> Dr<sup>a</sup> Neiva Maria de Almeida – Universidade Federal da Paraíba  
Prof<sup>a</sup> Dr<sup>a</sup> Natiéli Piovesan – Instituto Federal do Rio Grande do Norte  
Prof. Dr. Takeshy Tachizawa – Faculdade de Campo Limpo Paulista

<b>Dados Internacionais de Catalogação na Publicação (CIP) (eDOC BRASIL, Belo Horizonte/MG)</b>	
D569	Difusão do conhecimento através das diferentes áreas da medicina 2 [recurso eletrônico] / Organizadora Lais Daiene Cosmoski. – Ponta Grossa, PR: Atena Editora, 2019. – (Difusão do conhecimento através das diferentes áreas da medicina; v. 2)  Formato: PDF Requisitos de sistema: Adobe Acrobat Reader Modo de acesso: World Wide Web Inclui bibliografia ISBN 978-85-7247-881-6 DOI 10.22533/at.ed.816192312  1. Medicina – Pesquisa – Brasil. 2. Saúde - Brasil. 3. Diagnóstico. I. Cosmoski, Lais Daiene. II. Série.  CDD 610.9
<b>Elaborado por Maurício Amormino Júnior – CRB6/2422</b>	

Atena Editora  
Ponta Grossa – Paraná - Brasil  
[www.atenaeditora.com.br](http://www.atenaeditora.com.br)  
contato@atenaeditora.com.br

## APRESENTAÇÃO

Cada vez mais percebemos, que no mundo da ciência, principalmente da área da saúde, nenhuma profissão trabalha sozinha, é necessário que vários profissionais estão envolvidos e engajados em conjunto, prezando pela, prevenção, diagnóstico e tratamento de diversas patologias, visando sempre a qualidade de vida da população em geral.

A Coletânea Nacional “Difusão do Conhecimento Através das Diferentes Áreas da Medicina” é um *e-book* composto por 4 volumes artigos científicos, que abordam relatos de caso, avaliações e pesquisas sobre doenças já conhecidas da sociedade, trata ainda de casos conforme a região demográfica, onde os locais de realização dos estudos estão localizados em nosso país, trata também do desenvolvimento de novas tecnologias para prevenção, diagnóstico e tratamento de algumas patologias.

Abordamos também o lado pessoal e psicológico dos envolvidos nos cuidados dos indivíduos, mostrando que além dos acometidos pelas doenças, aqueles que os cuidam também merecem atenção.

Os artigos elencados neste *e-book* contribuirão para esclarecer que ambas as profissões desempenham papel fundamental e conjunto para manutenção da saúde da população e caminham em paralelo para que a para que a ciência continue evoluindo para estas áreas de conhecimento.

Desejo a todos uma excelente leitura!

Lais Daiene Cosmoski

## SUMÁRIO

<b>CAPÍTULO 1</b> .....	<b>1</b>
MIOCARDIOPATIA DE TAKOTSUBO: UM RELATO DE CASO	
Yago de Lima Barrozo	
Marcos Vinícius da Silva Araújo	
Rodrigo Lucas Severiano Vieira	
Ana Flávia de Holanda Veloso	
Guilherme Almeida Fontenele	
Juan Forte Sampaio Gomes	
Vanessa Nobre Veras	
Raul de Amorim Felipe	
<b>DOI 10.22533/at.ed.8161923121</b>	
<b>CAPÍTULO 2</b> .....	<b>10</b>
MODALIDADES TERAPÊUTICAS NO TRATAMENTO DA DOR DO MEMBRO FANTASMA	
Mariana Batista da Silva	
Aline Silva Florêncio	
Alzilane do Nascimento de Lima	
Amanda Maria das Graças de Farias Silva	
Ana Paula Lucas Mendonça Almeida	
Gabrielly Lais de Andrade Souza	
Italo Rocemberg de Moura Xavier	
Jordana Abdalla Batista	
José Daniel do Nascimento	
Sâmara Aline Brito Brainer	
Talita Correia do Amaral	
Tatiane Simonica da Silva	
<b>DOI 10.22533/at.ed.8161923122</b>	
<b>CAPÍTULO 3</b> .....	<b>16</b>
NEFROPATIA DIABÉTICA: DISTÚRBIOS NEURAI E VASCULARES	
Rafael Cícero de Lima e Silva	
Rafael Nóbrega Cavalcante	
Beatriz Guedes	
Giovanna Cecília Freitas Alves de Arruda	
Lucas Emanuel Carvalho Cavalcante	
Lucas Muller dos Santos Oliveira	
Mariana de Fatima Alves Ribeiro	
Mariella Ribeiro Wanderley Araújo	
Sarah Raquel Martins Rodrigues	
Thaís Regina de Souza Lins Nascimento Ribeiro	
Talyta Laís de Abreu Pereira	
Wilberto Antônio de Araújo Neto	
<b>DOI 10.22533/at.ed.8161923123</b>	
<b>CAPÍTULO 4</b> .....	<b>18</b>
PAPEL DOS MARCADORES BIOQUÍMICOS CHO-M, NAA E CR NA FISIOPATOLOGIA E DIAGNÓSTICO DOS GLIOMAS	
Pedro Hidekatsu Melo Esaki	
Marcos Masini	
Rodrigo Siguenza Saquicela	
Rafael Luiz Alcântara Nascimento Amorim	
Rômulo Di Tomaso Pereira Milhomem	
Vitor Brandão de Araújo	

Cleide Caroline Barbosa  
Francielly Marques Leite  
Isadora Leonel de Paiva  
Gabriella Leonel de Paiva

DOI 10.22533/at.ed.8161923124

**CAPÍTULO 5 ..... 26**

PREDIÇÃO DE COMPLICAÇÕES EM CIRURGIA BARIÁTRICA: REVISÃO SISTEMÁTICA

Claudinalle Farias Queiroz de Souza  
Starch Melo de Souza  
Josemberg Marins Campos  
Paulo Jorge Leitão Adeodato  
Magdala de Araújo Novaes

DOI 10.22533/at.ed.8161923125

**CAPÍTULO 6 ..... 38**

SMOKING INCREASES PREVALENCE OF CHRONIC PERIODONTITIS IN INDIVIDUALSWITH  
CHRONIC KIDNEY DISEASE

Cristiane Oliveira de Souza  
Rogério Baumgratz de Paula  
Isabel Cristina Gonçalves Leite  
Letícia Martins de Paiva  
Giovanna César Caruso  
Júlia Azevedo Bahia  
Jessica do Amaral Bastos

DOI 10.22533/at.ed.8161923126

**CAPÍTULO 7 ..... 53**

PREVALÊNCIA DE TRANSTORNOS MENTAIS COMUNS EM PACIENTES COM TONTURA

Wallace Lima Habib Bomfim  
Marcílio Ferreira Marques Filho

DOI 10.22533/at.ed.8161923127

**CAPÍTULO 8 ..... 66**

PREVENÇÃO DE FIBRILAÇÃO ATRIAL PÓS-OPERATÓRIA

Gustavo Henrique Belarmino Góes  
Filipe Domingos Beisl Oliveira  
Caroline Bernardi Fabro  
Lucyeli Luna Lopes de Amorim  
Dário Celestino Sobral Filho

DOI 10.22533/at.ed.8161923128

**CAPÍTULO 9 ..... 70**

PROCEDIMENTO OPERACIONAL PADRÃO PARA EXAMES RADIOLÓGICOS REALIZADOS EM  
LEITOS DE UNIDADES DE INTERNAÇÃO HOSPITALAR

Alyson Marcos gelsleichter  
Andréa Huhn  
Dorival Menegaz Nandi

DOI 10.22533/at.ed.8161923129

**CAPÍTULO 10 ..... 83**

QUALIDADE DE VIDA NOS PACIENTES COM FIBRILAÇÃO ATRIAL

Gustavo Henrique Belarmino Góes  
Johnny Dreher Folle

Lucyeli Luna Lopes de Amorim  
Caroline Bernardi Fabro  
Dário Celestino Sobral Filho

**DOI 10.22533/at.ed.81619231210**

**CAPÍTULO 11 ..... 87**

RELATO DE CASO: CORISTOMA NEUROMUSCULAR EM REGIÃO SUBESCAPULAR

Victor Batista Da Silva Neto  
Phellipe Ramos Accioly  
Lara Matos Rodrigues  
Andreza Dias De Souza Parente  
Janine Fernandes Rocha  
Lucas Pazolinni Viana Rocha

**DOI 10.22533/at.ed.81619231211**

**CAPÍTULO 12 ..... 92**

RELEVÂNCIA TRANSLACIONAL DE INDICADORES DO METABOLISMO DE GRUPAMENTOS METILA EM GLIOMA

Giselle Marianne Faria  
Aline Casimiro Gomes  
Bruno Lima Pessoa  
Clóvis Orlando da Fonseca  
Thereza Quírico-Santos

**DOI 10.22533/at.ed.81619231212**

**CAPÍTULO 13 ..... 113**

RISCO DE ACIDENTE VASCULAR ENCEFÁLICO EM MULHERES JOVENS RELACIONADO AO USO DO CONTRACEPTIVO ORAL

Mikaela Aparecida de Oliveira Xavier  
Luciene Pereira Coelho de Azevedo

**DOI 10.22533/at.ed.81619231213**

**CAPÍTULO 14 ..... 120**

SEGURANÇA CIRÚRGICA: AÇÃO EDUCATIVA COM ACADÊMICOS DE ENFERMAGEM

Maria Helane Rocha Batista Gonçalves  
Lara Lídia Ventura Damasceno  
Maria Wikaelle Marinho Sousa  
Juliana Alencar Moreira Borges  
Ana Zaiz Flores Hormain Teixeira de Carvalho  
Meysa Quezado de Figueiredo Cavalcante Casadevall  
Aline de Souza Pereira  
Thais Marques Lima

**DOI 10.22533/at.ed.81619231214**

**CAPÍTULO 15 ..... 131**

TÉCNICAS DE FISIOTERAPIA EM CRIANÇAS PORTADORES DE PARALISIA CEREBRAL COM FRAQUEZA MUSCULAR RESPIRATÓRIA: UMA REVISÃO INTEGRATIVA DA LITERATURA

Emanuel Fernandes Ferreira da Silva Júnior  
Anny Karolainy Silva de Lima  
Erivaldo Gomes da Silva  
Maria Carolina Moura de Oliveira  
Catarina Souza Ferreira Rattes Lima

**DOI 10.22533/at.ed.81619231215**



**CAPÍTULO 16 ..... 139**

TETRAPLEGIA E PARAPLEGIA: A IMPORTÂNCIA DA ENFERMAGEM NA ORIENTAÇÃO ENTRE CUIDADORES, FAMILIARES E EQUIPE INTERDISCIPLINAR

Italo Rocemberg de Moura Xavier  
Aline Silva Florêncio  
Ana Paula Lucas Mendonça Almeida  
Edlainy Andrade Gomes  
Gabriela Oliveira Cavalcanti  
José Daniel do Nascimento  
Karla Simone de Brito Brock  
Laryssa Grazielle Feitosa Lopes  
Mariana Batista da Silva  
Nadja Nayara Albuquerque Guimarães Sousa  
Raissa Wiviane Nunes dos Santos Sousa  
Thamyris Vieira de Barros

**DOI 10.22533/at.ed.81619231216**

**CAPÍTULO 17 ..... 145**

TOFACITINIB NO TRATAMENTO DE DERMATITE ATÓPICA COM PRURIDO CRÔNICO

Maria Luisa Silva Reinaux  
Maria Teresa Pereira da Silva  
Ana Carolina de Carvalho Correia

**DOI 10.22533/at.ed.81619231217**

**CAPÍTULO 18 ..... 151**

TREINO DE ATIVIDADES DINÂMICAS EM LESÃO CEREBRAL: CASO CLÍNICO

Luana da Silva Fortes  
Victória Maria Silva Machado  
Adriana Cavalcanti de Macêdo Matos

**DOI 10.22533/at.ed.81619231218**

**CAPÍTULO 19 ..... 156**

ULTRASSONOGRRAFIA ENCEFÁLICA UTILIZADA EM CIRURGIAS DE RESSECÇÃO DE METÁSTASE CEREBRAL AVALIADA PELO ÍNDICE DE KARNOFSKY

Pedro Hidekatsu Melo Esaki  
Marcos Masini  
Vitor Brandão de Araújo  
Rafael Luiz Alcântara Nascimento Amorim  
Willyclay Jordan dos Santos Borges  
João Pedro Cavalcante Roriz Teixeira  
Tatiana Paranhos de Campos Ribeiro  
Joaquim Alberto Barbosa Mariano de Castro  
Larissa Neves Cordeiro Gomes  
Rômulo Di Tomaso Pereira Milhomem

**DOI 10.22533/at.ed.81619231219**

**CAPÍTULO 20 ..... 164**

UTILIZAÇÃO DE INCRETINAS NO TRATAMENTO DA DIABETES MELLITUS TIPO 2

Ducivânia da Silva Tenório  
Eliza Wedja Santos de Sales  
Jamicelly Rayanna Gomes da Silva  
Maria Eduarda Silva Amorim  
Camilla Isabella Ferreira Silva  
Stéphanie Camilla Vasconcelos Tavares  
Nayane Monalys Silva de Lima

Aline de Moura Borba  
Viktória Júlya Alves de Albuquerque  
Joanne Cordeiro de Lima Couto  
Cynthia Gisele de Oliveira Coimbra  
Risonildo Pereira Cordeiro

**DOI 10.22533/at.ed.81619231220**

**CAPÍTULO 21 ..... 176**

O PAPEL DA ENFERMAGEM FRENTE AO PACIENTE ACOMETIDO POR ALZHEIMER

Manoel Felipe Nunes da Rocha  
Germana Maria dos Santos  
Leandra Josefa dos Santos  
Gabrielly Laís de Andrade Souza  
Silvana de Oliveira Lima Silva

**DOI 10.22533/at.ed.81619231221**

**CAPÍTULO 22 ..... 185**

SAÚDE DO HOMEM UNIVERSITÁRIO: ANÁLISE DOS COMPORTAMENTOS RELACIONADOS À SEGURANÇA NO TRÂNSITO E VIOLÊNCIAS ENTRE ESTUDANTES DE UMA INSTITUIÇÃO PÚBLICA BRASILEIRA

Luís Paulo Souza e Souza  
Aline Laís de Souza Silva  
Sara de Lacerda Caldas Silva  
Paulla Machado D'Athayde  
Izabella Vitor Lopes  
Jade Chartone Eustáquio  
Michelle Venâncio dos Santos  
Maurício Santana de Melo  
Gabriel Nogueira de Paiva Aguiar  
Tamara Figueiredo

**DOI 10.22533/at.ed.81619231222**

**SOBRE A ORGANIZADORA..... 198**

**ÍNDICE REMISSIVO ..... 199**

## SMOKING INCREASES PREVALENCE OF CHRONIC PERIODONTITIS IN INDIVIDUALS WITH CHRONIC KIDNEY DISEASE

Data de aceite: 19/11/2019

### **Cristiane Oliveira de Souza**

Program in Brazilian Health, and Voluntary Dentist of the Interdisciplinary Nucleus of Studies, Research, and Treatment in Nephrology (NIEPEN) of the Federal University of Juiz de Fora (UFJF), Juiz de Fora, MG, Brazil

### **Rogério Baumgratz de Paula**

MD, PhD  
Department of Clinical Medicine and researcher at NIEPEN, UFJF, Juiz de Fora, MG, Brazil

### **Isabel Cristina Gonçalves Leite**

D.H.Sc  
Department of Public Health UFJF, Juiz de Fora, MG, Brazil

### **Letícia Martins de Paiva**

Faculty of Odontology - UFJF

### **Giovanna César Caruso**

Faculty of Odontology - UFJF

### **Júlia Azevedo Bahia**

MDS  
Department of Dentistry, UFJF

### **Jessica do Amaral Bastos**

D.H.Sc  
Dentistry of the Interdisciplinary Nucleus of Studies, Research, and Treatment in Nephrology (NIEPEN) of the Federal University of Juiz de Fora (UFJF), Juiz de Fora, MG, Brazil

**ABSTRACT:** Chronic periodontitis (CP) is an infectious inflammatory disease, which can be increased by the systemic inflammatory response in patients with chronic kidney disease (CKD). The aim of this study was to evaluate the prevalence of CP in smokers in the pre-dialysis stages of CKD. **Subjects and Methods:** Ninety-four individuals were and divided into two groups; group 1 was composed of smokers with CKD and group 2 was composed of non-smokers with CKD. **Results:** The probing depth (PD) was significantly elevated in group 1 than in group 2 ( $2.28 \pm 0.52$  mm vs.  $1.89 \pm 0.47$  mm, respectively;  $P < .001$ ). It was found that CP was more prevalent in group 1, with a total of 41 patients (87%), compared to group 2 in which 33 patients were affected by the disease (70%). **Conclusion:** Smoking appears to increase the prevalence of CP in patients with CKD.

**KEYWORDS:** chronic renal insufficiency, periodontitis, smoking

PREVALÊNCIA DA PERIODONTITE  
CRÔNICA EM PACIENTES RENAIIS  
CRÔNICOS TABAGISTAS

## 1 | INTRODUCTION

Chronic kidney disease (CKD) is considered a global public health problem<sup>1</sup> In Brazil, the prevalence of CKD is 40.5/100,000, which is lower than the prevalence of CKD in the USA and Japan.<sup>2</sup> Chronic renal disease has a high mortality rate. Cardiovascular risk factors, such as diabetes mellitus (DM), high blood pressure (HBD), dyslipidemia, and smoking, are often noted in this population.<sup>3,4</sup> Additionally, some non-traditional risk factors, such as inflammation, oxidative stress, uremic toxins, anemia, and hyperparathyroidism, can contribute to high morbidity and mortality rates among patients with cardiovascular disease (CVD).<sup>5</sup>

In recent years, chronic periodontitis (CP) has been considered a cardiovascular risk factor.<sup>6</sup> The dissemination of the Gram-negative bacteria present in patients with CP destroys the supporting tissues of the teeth, which in turn induces local inflammation, and is associated with a systemic inflammatory and immunological response; this results in the production of cytokines and prostaglandins.<sup>7</sup> These alter the homeostatic properties of the endothelium and its permeability, thereby increasing its adhesiveness to leukocytes and platelets, modifying the anticoagulant properties of the procoagulants, and resulting in endothelial dysfunction<sup>7,8</sup> Thus, CP is considered a subclinical disease associated with atherosclerosis<sup>8</sup>.

Chronic periodontal inflammation may contribute to a systemic inflammatory overload in patients with CKD, which can lead to a decrease in the estimated glomerular filtration rate (eGFR).<sup>9,10</sup> Some published studies have demonstrated the bidirectional relationship between CP and CKD.<sup>11-13</sup> Concordantly, the data from previous study of our group found that CP is more severe in patients with CKD compared to systemically healthy individuals. The findings of this study suggest that hypovitaminosis D leads to a decrease in the immune response in patients with CKD, thereby leading to a more severe form of the disease in these patients.<sup>14</sup>

Recently, some studies have demonstrated a significant association between smoking and CP,<sup>15, 16</sup> which could contribute to an increased risk of CVD, as well as an increased loss of renal function in patients with CKD.<sup>17</sup> However, there is currently a lack of information regarding the prevalence of CP in smokers with CKD. This study aimed to evaluate the prevalence of CP in smokers with CKD.

## 2 | SUBJECTS AND METHODS:

This is a cross-sectional study according to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Initiative. The participants of this study were found using a convenience sampling method amongst patients of a secondary healthcare service in Juiz de Fora, Minas Gerais, and Brazil. A total of

1,167 patients with CKD, secondary to HBD and DM, were being managed under conservative treatment at the healthcare service between 2014 and 2016. Of these, 94 subjects, 47 smokers (known as group 1) and 47 non-smokers (known as group 2) were considered eligible for this study (Figure 1). All subjects were aged above 18 years and had an eGFR of  $< 60 \text{ mL} / \text{min} / 1.73 \text{ m}^2$ . Patients who were taking anti-inflammatory drugs and antibiotics were excluded during the last four weeks of the dental evaluation. Furthermore non-smokers with  $< 10$  years of smoking cessation; pregnant women; patients diagnosed with HIV, hepatitis, neoplasms, or other infections; patients with any other infection or a fever of unknown origin ; those who were treated for periodontitis in the last six months; and those who declined to provide written consent were also excluded.

The CKD diagnosis and the disease stage assessment were made following the criteria proposed by the National Kidney Foundation (K / DOQI, 2013)<sup>18</sup> and the eGFR was calculated based on the serum creatinine levels using the Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) equation.<sup>19</sup> The clinical and laboratory data collected included the following: gender, age, ethnicity, household income, educational, body mass index (BMI), stage and etiology of the CKD, previous diagnoses of CVD, alcohol consumption, systolic/diastolic blood pressure, DM diagnosis, HBD diagnosis, total cholesterol level, high density lipoprotein (HDL) level, serum creatinine level, and fasting blood glucose level. Only data from patients who had laboratory tests from a maximum of three months prior to clinical evaluation to three months after clinical evaluation were considered in this study.

A periodontal examination was conducted by two qualified examiners. The data obtained from the interclass correlation coefficient test during the inter-examiner calibration was 0.88 and 0.81 from the intra-examiner calibration. All of the participant's teeth, except the third molars, were examined. The probing depth (PD) and gingival recession were measured at six sites per tooth (mesiobuccal, buccal, distobuccal, mesiolingual, lingual, distolingual) using a computerized probe (Florida Probe Corp., USA). The clinical attachment level (CAL) was calculated using the distance between the cementum-enamel junction (CEJ) and the base of the probable pocket. The PD was considered as the distance of the gingival margin to the apical limit of the periodontal pocket, according to the software used (Florida Probe Corp., USA), the number of sites with bleeding on probing (BOP) was evaluated. The severity of CP was classified as mild, moderate, and severe according to the classification suggested by Eke et al (2012),<sup>20</sup> severe CP involved the presence of two or more interproximal sites with a  $\text{CAL} \geq 6 \text{ mm}$  (not in the same tooth) and one or more interproximal sites with a  $\text{PD} \geq 5 \text{ mm}$ ; moderate CP comprised of the presence of two or more interproximal sites with a  $\text{CAL} \geq 4 \text{ mm}$  (not in the same tooth) and one or more interproximal sites with a  $\text{PD} \geq 5 \text{ mm}$  (not in the same tooth); mild CP

involved the presence of two or more interproximal sites with a CAL  $\geq$  3 mm and two interproximal sites with a PD  $\geq$  4 mm (not in the same tooth) or a site with a PD  $\geq$  5 mm. CP was determined as generalized when more than 30% of the sites had a PD  $>$  4 mm. Patients who were diagnosed with CP were referred to the Faculty of Dentistry at the Federal University of Juiz de Fora (UFJF), for specialized treatment.

Information regarding smoking was collected, such as number of cigarettes smoked per day, if they were considered light smokers ( $<$  10 cigarettes / day) or heavy smokers ( $\geq$  10 cigarettes/day), how long they had been addicted, and an evaluation of the degree of smoking dependence using a test developed by Fagerstrom, the Fagerstrom Tolerance Questionnaire (FTQ,1978)<sup>21</sup> and its revised version, the Fagerstrom Test for Nicotine Dependence (FTND,1991).<sup>22</sup> These tests assess the degree of nicotine dependence of a smoker. In Brazil, this scale was validated by Carmo and Pueyo in 2002,<sup>23</sup> and is composed of questions that focus on the reason for the addiction, the ability to quit smoking, and the consumption of tobacco.

The scale is based on 6 questions that indicate the individual's dependence: the number of cigarettes smoked per day; the amount of nicotine present in each cigarette; the effectiveness of the drug; how long it takes to smoke the first cigarette in the morning; if it is linked to the relief from nicotine withdrawal syndrome; the greater control of internal stimuli compared to external leading to the consumption of tobacco. Scale scores range from 0 to 10, with the response being the sum of all values; high dependence is characterized by a score  $\geq$  6, and a score of  $<$  3 indicates low nicotine dependence. In this study, we considered high dependence  $\geq$  5 and low dependence  $<$  5. This project was approved by the Ethics in Research Committee through the Brazilian Platform (CAAE: 36698614.0.0000.5147).

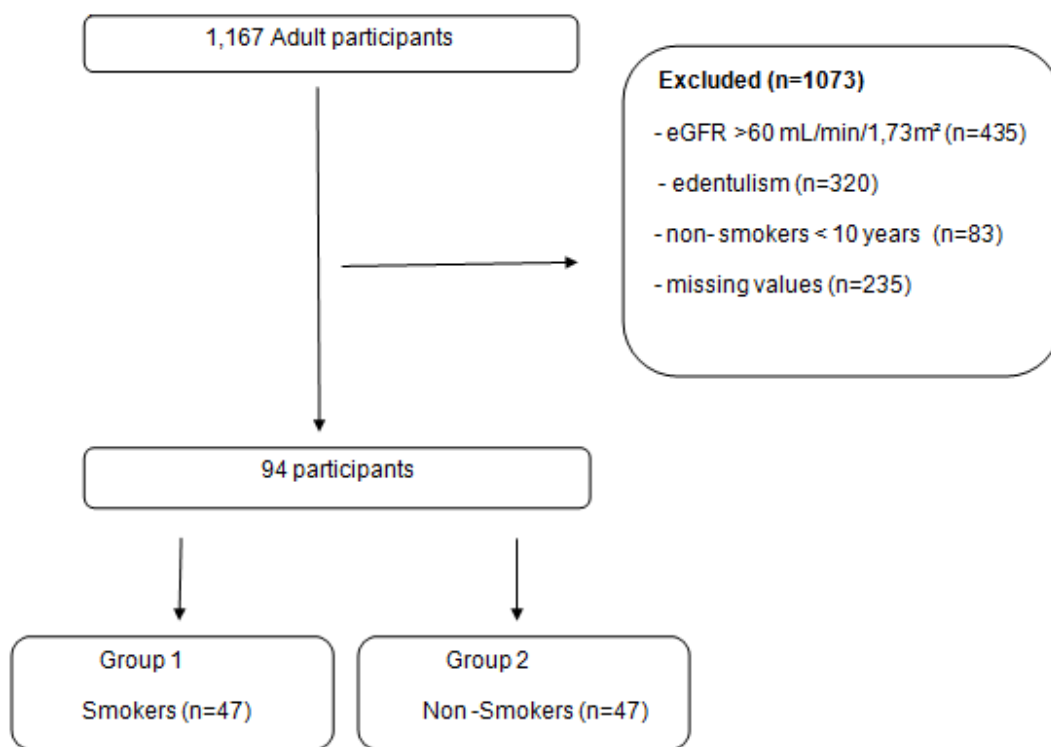


Figure 1. Participant's flow chart.

### 3 | STATISTICAL ANALYSIS

The data were evaluated by the Statistical Package for the Social Sciences (SPSS), version 21.0. The quantitative variables were expressed as mean and standard deviation, for the data that presented as normal distribution, was analyzed using the Student's t-test. The qualitative variables were represented by relative and absolute frequencies and analyzed using the chi-squared test with Fisher's exact test. Statistical difference was considered for  $P$  values  $< .05$ .

### 4 | RESULTS

Patients in group 1 ( $n = 47$ ; 33 males; mean age = 60 years) and group 2 ( $n = 47$ ; 33 males; mean age = 60 years) were paired for demographic, clinical, and laboratory data. It was noted that gender, age, ethnicity, education, HBD, DM status, stage of CKD, etiology of CKD, history of CVD, and values for fasting glucose levels, total cholesterol, serum creatinine and eGFR did not differ statistically between groups, indicating homogeneity (Tables 1 and 2). In this study, the groups were predominantly men with an average age of 60 years and a low education and low household income, who were the usual users of the public health system, and so had restricted access to dental services. The population analyzed in this

study was composed of individuals with CKD, secondary to HBD and DM, which are responsible for about 70% of the cases of CKD worldwide.

**TABLE 1.** Demographics and clinicals characteristics of study population by groups

Characteristics	Group 1 n=47 (%)	Group 2 n=47 (%)	P (value)
<b>Age, years</b>			
< 60	24 (51,1%)	21 (44,7%)	0,340
>60	23 (48,9%)	26 (55,3%)	
<b>Gender</b>			
Men	33 (70,2%)	33 (70,2%)	0,589
Women	14 (29,8%)	14 (29,8%)	
<b>Ethnicity</b>			
White	20 (42,6%)	28 (59,6%)	0,074
Non- White	27 (57,4%)	19 (40,4%)	
<b>Education</b>			
Less than high school	28 (59,8%)	34 (72,4%)	0,452
High school	16 (34,0%)	12 (25,5%)	
More than high school	3 (6,4%)	1 (2,1%)	
<b>Lower income</b>			
Yes	46 (97,8%)	39 (83,0%)	0,038
No	1 (2,1%)	8 (17,0%)	
<b>Hypertensive</b>			
Yes	46 (97,9%)	46 (97,9%)	0,753
No	1 (2,1%)	1 (2,1%)	
<b>Diabetic</b>			
Yes	23 (49,8%)	28 (59,6%)	0,117
No	24 (51,1%)	19 (40,4%)	
<b>Stage of CKD</b>			
3 A /3 B	33 (70,2%)	26 (55,3%)	0,204
4	10 (21,3%)	19 (40,4%)	
5	4 (8,5%)	2 (4,3%)	
<b>Etiology of CKD</b>			
Hypertensive nephropaty	23 (48,9%)	23 (48,9%)	0,313
Diabetic nephropaty	13 (27,7%)	18 (38,3%)	
Chronic glomerulonephritis	5 (10,6%)	1 (2,1%)	
Other and unspecified	6 (12,8%)	5 (10,7%)	
<b>Previous diagnoses of CVD</b>			
Yes	15 (31,9%)	21 (44,4%)	0,144
No	32 (68,1%)	26 (55,5%)	
<b>Alcohol consumption</b>			
Yes	21 (44,7%)	14 (29,8%)	0,011
No	26 (55,3%)	33 (70,2%)	
<b>BMI (kg/m<sup>2</sup>)</b>			
<18,5	3 (6,4%)		0,005
18,5-24,99	22 (46,8%)	10 (21,3%)	
25-29,99	14 (29,8%)	17 (36,2%)	
>30,00	8 (17%)	20 (42,6%)	

p≤0,05; CKD= chronic kidney disease; CVD= cardiovascular disease; BMI:= body mass index

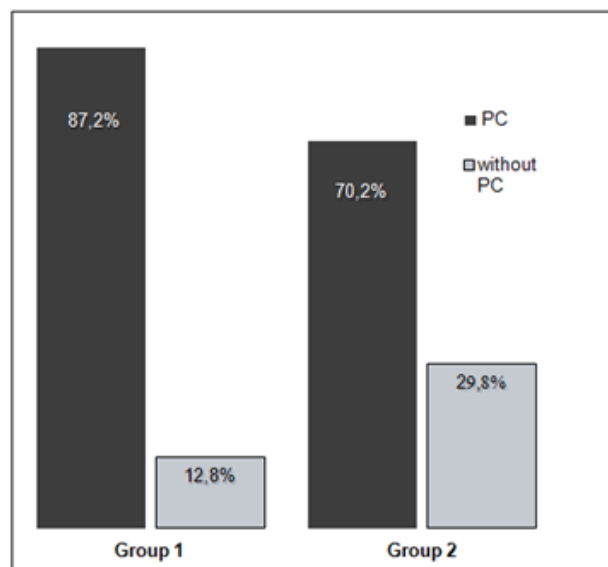


TABLE 2. Clinical and Laboratory data of study population divided by groups

Variables	Group 1 n=47 (Mean ± SD)	Group 2 n=47 (Mean ± SD)	P (value)
Fasting blood glucose (mg/dL)	104 ± 46	115 ± 37	0,736
Total cholesterol (mg/dL)	194 ± 52	180 ± 38	0,069
HDL cholesterol (mg/dL)	49 ± 17	41 ± 9	0,001
Creatinine (mg/dL)	2,2 ± 1,1	2,3 ± 1,0	0,789
eGFR ( mL/min/1,73m <sup>2</sup> )	36 ± 13	33 ± 12	0,503
SBP (mmHg)	134 ± 21	140 ± 16	0,080
DBP (mmHg)	72 ± 21	72 ± 23	0,591

p<0,05; SD = standard deviation; HDL = high density lipoprotein ; eGFR= estimated glomerular filtration rate; SBP = systolic blood pressure; DBP = diastolic blood pressure.

This study found that CP was significantly more prevalent in group 1, in which 41 patients (87%) were diagnosed with CP, compared to the 33 patients (70%) in group 2 with CKD ( $P = .035$ ) (Figure 2). During the analysis of periodontal clinical parameters, the mean number of similar teeth was noted, with significantly higher levels of PD in smokers when compared to non-smokers ( $2.28 \pm 0.52$  mm compared to  $1.89 \pm 0.47$  mm, respectively;  $P = .001$ ). The CAL and BOP were  $3.97 \pm 1.23$  mm and  $21 \pm 25$  sites, respectively, in group 1 and  $4.11 \pm 1.16$  mm and  $30 \pm 27$  sites, respectively, in group 2. Regarding the extent of CP, it was considered generalized in 37 smokers and 33 non-smokers (Table 3).



**Figure 2.** Prevalence of CP and without CP in patients divided by Group 1 and Group 2; CP = chronic periodontitis  $P = .035$

**TABLE 3.** Evaluation of clinical periodontal parameter divided by groups

Variables	Group 1 n=47 (Mean $\pm$ SD)	Group 2 n=47 (Mean $\pm$ SD)	<i>P</i> (value)
N° of teeth	15 $\pm$ 7,6	14 $\pm$ 7,4	0,955
Probing depth (mm)	2,28 $\pm$ 0,52	1,89 $\pm$ 0,47	0,001
Clinical attachment level (mm)	3,97 $\pm$ 1,23	4,11 $\pm$ 1,16	0,463
Bleeding on probing (sites)	21 $\pm$ 25	30 $\pm$ 27	0,247
Generalized CP (%)	78,7%	70,2%	0,239
Severe CP (%)	48,9%	44,7%	0,418

$p \leq 0,05^*$ ; SD = standard deviation; CP = chronic periodontitis

The smoking history of group 1 indicated that the mean cigarette consumption was  $11 \pm 8$  cigarettes /day and the mean duration of active smoking was  $43 \pm 12$  years. When individuals were subdivided into light smokers ( $< 10$  cigarettes / day) and heavy smokers ( $\geq 10$  cigarettes / day), no difference was observed in the prevalence of CP among the two subgroups. On the other hand, smokers with higher scores in the FTND ( $n = 21$ ), who were considered to be highly dependent, presented with significant values for PD, CAL, and BOP when compared to those

with low dependence (n = 26) (Table 4).

TABLE 4. Fagerström Test for Nicotine Dependence (FTND) and clinical periodontal parameter

Variables	Highly Dependence (n=21) (Mean ± SD)	Low Dependence (n= 26) (Mean ± SD)	P (value)
N° of theeth	15 ± 6,9	14 ± 8,1	0,182
Probing depth (mm)	2,17 ± 0,33	2,37 ± 0,63	0,013
Clinical attachment level (mm)	4,12 ± 0,9	3,84 ± 1,4	0,049
Bleeding on probing (sites)	18 ± 18	23 ± 29	0,047
Generalized CP (%)	81%	76,9%	0,512

## 5 | DISCUSSION

In the present study, a higher prevalence of CP was observed in smokers with CKD compared to non-smokers. In the smoking group, the participants had a low dependence on nicotine, i.e., an average consumption of 11 cigarettes per day and an average time of exposure to tobacco of 43 years, which may be related to a higher prevalence of mild/moderate CP in this group.

CP is a chronic and inflammatory disease of infectious origin that has been associated with inflammatory factors in hemodialysis patients<sup>24</sup> and an increased risk of cardiovascular death in patients with CKD.<sup>7,25</sup> In a subpopulation of the NHANES III study, 13,748 individuals, 861 of whom were undergoing conservative CKD treatment, were followed up for a period of 14 years. At the end of this study, the authors observed that CP was associated with increased all-cause and, specifically, CVD mortality rates; the presence of CP in these individuals was an additional risk factor alongside other traditional risk factors for mortality, such as DM, hypertension, and smoking.<sup>25</sup>

In a cross-sectional study previously carried out by our group, the severity of CP in patients with CKD was assessed among four groups: systemically healthy subjects (with and without CP) were compared to patients with CKD (with and without CP). Periodontal clinical parameters, such as PD and CAL, were increased

in the CKD with CP group when compared to the systemically healthy groups. The percentage of sites with PD > 5 mm was similar in both groups with and without CKD, but the CAL was higher in the CKD with CP group when compared to the systemically healthy with CP group ( $32 \pm 18$  and  $18 \pm 16$ , respectively;  $P < .05$ ). The same significant trend was observed in relation to the percentage of BOP, patients with CKD with CP who had more severe cases of periodontal disease with a higher prevalence of inflammation compared to systemically healthy individuals with CP ( $51 \pm 32$  and  $23 \pm 2$ , respectively;  $P < .05$ ). With regards to systemic inflammation, the level of the inflammatory marker interleukin-6 (IL-6) was measured in the serum of the study subjects, and it was observed that the CKD with CP group had significantly higher levels of systemic inflammation when compared to the systemically healthy with CP group ( $14.3 \pm 10.8$  pg / mL and  $5.9 \pm 3.4$  pg / mL, respectively;  $P < .05$ ).<sup>26</sup>

The prevalence of CP in the general population is associated with local, systemic, and genetic risk factors, such as poor oral hygiene, systemic conditions such as DM and/or HIV infection, stress, socioeconomic level, and smoking status.<sup>27</sup> Several studies have shown a strong association between smoking and CP in the general population,<sup>28,29</sup> however, this association has not been evaluated in patients with CKD. This is the first study to evaluate the prevalence of CP in smokers with CKD.

In this study, a higher prevalence of CP was observed in smokers with CKD compared to non-smokers. This is consistent with a study by Shabrukh (2016),<sup>30</sup> in which it was observed that among 443 Pakistani smokers and non-smokers, there was a higher prevalence of CP in the smoking group (81.6%). Additionally, there was a greater chance of developing CP among heavy smokers ( $\geq 5$  cigarettes / day) compared to moderate/ light smokers ( $< 5$  cigarettes / day) and nonsmokers. In the current study, smokers consumed more cigarettes (11 cigarettes / day) and the average length of time of tobacco exposure was 43 years. An increased prevalence of CP among smokers with CKD (87%) was observed when compared to other studies focusing on systemically healthy smokers<sup>9,10,24</sup>

Smoking is a key risk factor for the development of CP, which can be seen through the host's response, resulting in alterations in neutrophil function, antibody production, fibroblastic activities, vascular factors, and the production of inflammatory mediators, according to the studies analyzed by Javed (2014).<sup>31</sup> In a study by Nile et al. (2013),<sup>32</sup> tumor necrosis factor alpha (TNF $\alpha$ ) and receptor activator of nuclear factor kappa-B ligand (RANKL) were shown to be good systemic indicators of the inflammatory process, which can in turn lead to osteoclastogenesis through an increase in RANKL expression and a decrease in osteoprotegerin (OPG) levels in osteoblasts. Under ideal physiological conditions, there is a balance between the reabsorption and bone formation, which is dependent on the receptor activator of

nuclear factor kappa-B (RANK)-RANKL-OPG axis. In patients with CP, there is a breakdown of this axis with a decrease in the OPG levels or an increase in the expression of RANKL, thereby leading to bone destruction.

In this study sample, smokers had significantly higher PD than non-smokers, although the values were not significant in terms of CAL. However, in other studies previously conducted by our group, patients with CKD and CP had similar PD values and increased CAL values when compared to those with CP who were systemically healthy.<sup>14</sup> This may be explained by the fact that this study involved patients with CKD in both groups (smokers and non-smokers), that the mean age of the patients was 60 years, and that the groups were paired in relation to their demographic, clinical, and laboratory data. This would explain why CAL is similar between the groups, as this represents bone loss over time due to the association of CKD in periodontal tissues. In contrast, smokers with CKD had increased PD compared to non-smokers. This could be because smoking contributes to an increase in the levels of inflammatory mediators.<sup>33</sup> On the other hand; an increase in local inflammation can be masked by the decrease in gingival bleeding. The data from this study is in agreement with the fact that of other similar study,<sup>34, 35</sup> in which BOP values were lower in smokers, although not significantly in comparison to those in the control group. The reduction of gingival bleeding in smokers may be associated with gingival vasoconstriction, secondary to the release of catecholamine, a hormone released by the nicotine present in tobacco.<sup>35</sup> In a study conducted by Calsina (2002),<sup>36</sup> an analysis of the effect of smoking on periodontal tissues among healthy individuals revealed significantly higher values for CAL and a lower number of sites with BOP in smokers compared to non-smokers, although there was no significant difference in terms of PD between the groups. In addition, the authors indicated that the values for BOP decreased and the PD, CAL, and gingival recession (RG) increased significantly after more than 10 years of smoking.

Tobacco consumption results in higher PD and greater loss of both clinical attachment and alveolar bone; consequently, smoking results in greater tooth loss.<sup>15</sup> In the present study, when analyzing the bone loss using CAL, no clinical or statistical relevance was found between the groups studied; clinical measures of PD and CAL are important for CP classification. These results are consistent with a study by Perrson et al. (2005)<sup>37</sup> in which smoking was not identified as a clinically significant risk factor for vertical bone loss. Using periapical radiographic analysis, the authors observed the long-term effect of all CP risk factors in the alveolar bone with the minimum history of smoking of 30 year.

The analyzed groups in this study had a similar mean number of teeth, which did not appear to be the main risk factor for dental loss in this population, when other probable causes for the event were taken into consideration, such as untreated

periodontal disease, restricted access to dental services, non-preventive dental treatments and an unfavorable socioeconomic status. In the study by Perrson et al. (2005)<sup>37</sup>, a greater dental loss was noted in heavy smokers when compared to light and non-smokers, all were individuals over 60 years old, and, as in this study, the identification of the possible causes related to the lower number of teeth became impossible to be evaluated. In this study, the smoking group there was no association between the mean number of cigarettes/day, mean smoking time, and CP severity. The prevalence was similar between light (<10 cigarettes/day) and heavy ( $\geq 10$  cigarettes/day) smokers. In the study by Jang et al. (2016),<sup>38</sup> the association between smoking status and CP in healthy adult Koreans was analyzed, and it was found that smoking was associated with a high risk for CP, with a mean consumption of  $\geq 10$  cigarettes/day and a time of exposure to smoking of  $\geq 20$  years. Systemically healthy patients who smoked from 1 to 30 cigarettes/day had a 2 to 4 times greater chance of developing CP compared to non-smokers, and the risk increased to 12 times for those who consumed more than 30 cigarettes/ day.

A study conducted in the Brazilian population found a strong association between smoking and the loss of clinical attachment in patients with severe CP, especially among heavy smokers and those aged 30–39 years compared to individuals over 50 years of age.<sup>39</sup> As in this study, most studies use only the tobacco history of the participants to find the association between smoking and CP. In this study, the FTND was used to assess the degree of nicotine dependence; 44.7% of patients in this study were considered highly dependent ( $\geq 5$  points) and presented lower mean values of PD and less sites with BOP than those with low nicotine dependence with a higher CAL, along with the generalized extension of their periodontal disease. Thus, it seems that the use of the FTND in this study, in addition to the smoking history, is suggestive of a higher specificity in the evaluation of the degree of nicotine dependence of smokers, which demonstrates significant associations with the periodontal disease clinical parameters.

## 6 | CONCLUSION

The present study has some limitations. CP was evaluated in a single center and the sample was selected using a convenience method. In conclusion, the data obtained in this study suggests that smoking constitutes a risk factor for the development of CP in patients with CKD.

## REFERENCES

Bastos MG, Bregman R, Kirsztajn, GM. **Chronic kidney diseases: common and harmful, but also**

**preventable and treatable.** Rev Assoc Med Bras 2010; 56(2): 248-53.

**Brazilian Guidelines on Chronic Renal Disease.** J Bras Nefrol 2004; 26 (Suppl 1):S1-S49.

Brazil. **Ministry of Health. Health Care Secretariat. Department of Specialized and Thematic Care. Clinical Guidelines for Care of Patients with Chronic Kidney Disease in the Sistema Único de Saúde** 2014: 1-37.

Bucharles SGE, Varela AM, Barberato SH, Pecoits – Filho R. **Assessment and management of cardiovascular disease in patients with chronic kidney disease.** J Bras Nefrol 2010; 32: 120-127.

Foley RN. **Clinical epidemiology of cardiovascular disease in chronic kidney disease.** J Ren Care 2010; 36: 4-8.

Kshirsagar AV, Moss KL, Elter JR, Beck JD, Offenbacher S, Falk RJ. **Periodontal disease is associate with renal insufficiency in the Artherosclerosis Risk in Communities (ARIC) Study.** Am J of Kidney Dis 2005; 45: 650-7.

Tonetti MS, Van Dyke TE and on behalf of working group 1 of the joint EFP/ AAP workshop. **Periodontitis and atherosclerotic cardiovascular disease: consensus report of the Joint EFP/ AAP Workshop on Periodontitis and Systemic Diseases.** J Clin Periodontol 2013; 40 (Suppl. 14): S24-S29.

Lockhart PB, Bolger AF, Papapanou PN, et al. **Periodontal Disease and Atherosclerotic Vascular Disease: Does the Evidence Support an Independent Association? A Scientific Statement From the American Heart Association.** Circulation 2012; 125: 2520-44.

Grubbs V, Vittinghoff E, Beck JD, et al. **The Association Between Periodontal Disease and Kidney Function Decline in African Americans: The Jackson Heart Study.** J Periodontol 2015; 86: 1126-32.

Iwasaki M, Taylor GW, Nesse W, Vissink A, Yoshihara A, Miyazaki H. **Periodontal disease and decreased kidney function in Japanese elderly.** Am. J Kidney Dis 2012; 59: 202-9.

Fisher MA, Taylor GW, Shelton BJ, et al. **Periodontal disease and other nontraditional risk factors for CKD.** Am J Kidney Dis 2008; 51: 45-52.

Fisher MA, Taylor GW, West BT, McCarthy ET. **Bidirectional relationship between chronic kidney and periodontal disease: a study using structural equation modeling.** Kidney Int 2011; 79 :347-55.

Ariyamuthu VK, Nolph KD, Ringdahl BE. **Periodontal disease in chronic kidney disease and end-stage renal disease patients: a review.** Cardiorenal Med 2013; 3: 71-8.

Bastos JA, Andrade LC, Ferreira AP, et al. **Serum levels of vitamin D and chronic periodontitis in patients with chronic kidney disease.** J Bras Nefrol 2013; 35: 20-6.

Bergstrom J. **Influence of tobacco smoking on periodontal bone height. Long- term observations and a hypothesis.** J Clin Periodontol 2004; 31: 260-6.

Chu YH, Tatakis DN, Wee AG. **Smokeless tobacco use and periodontal health in a rural male population.** J Periodontol 2010; 81: 848-54.

Hall ME, Wang W, Okhomina V, et al. **Cigarette Smoking and Chronic Kidney Disease in African Americans in the Jackson Heart Study.** J Am Heart Assoc 2016; 5:1-6.

**KDIGO Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease.** *Kidney International Supplement* 2013; 3(Suppl 1):S5-S14.

Levey et al. **A New Equation to Estimate Glomerular Filtration Rate.** *Ann Intern Med* 2009; 150: 604-12.

Eke PI, Dye BA, Wei L, Thornton-Evans GO, Genco RJ. **Prevalence of Periodontitis in Adults in the United States: 2009 and 2010.** *J Dent Res* 2012; 91: 914-20.

Fagerstrom KO, Schneider NG. **Measuring nicotine dependence: a review of the Fagerstrom Tolerance Questionnaire.** *J Behav Med* 1989; 12: 159-82.

Heatherton TF, Kozlowski LT, Frecker RC, Fagerström KO. **The Fagerström Test for Nicotine Dependence: a revision of the Fagerström Tolerance Questionnaire.** *Br J Adiction* 1991; 86: 1119-27.

Carmo JT, Pueyo, AA. **The Portuguese adaptation of the Fagerström test for nicotine dependence (FTND) to evaluate nicotine dependence and tolerance in Brazilian smokers.** *Rev. Bras. Med* 2002; 59: 73-80.

Brito F, Almeida S, Figueredo CMS, Bregman R, Suassuna JHR, Fischer RG. **Extent and severity of chronic periodontitis in chronic kidney disease patients.** *J Periodont Res.* 2012 ;47: 426-30.

Shamal P, Dietrich T, Ferro CH, Cockwell P, Chapple ILC. **Association between Periodontitis and mortality in stages 3-5 Chronic Kidney Disease: NHANES III and linked mortality study.** *J Clin Perio* 2016; 43: 104-13.

Bastos JA, Andrade LCF, Ferreira AP e cols. **Low levels of vitamin D and LL-37 in chronic kidney disease: association with chronic periodontitis.** *I J British* 2015; 2.

Loesche WJ, Grossman NS. **Periodontal disease as a specific, albeit chronic, infection: diagnosis and treatment.** *Clin Microbiol Rev.* 2001; 14: 727-52.

Bergstrom J. **Tobacco smoking and risk for periodontal disease.** *J Clin Periodontol* 2003; 30: 107-13.

Bergstrom, J. **Periodontitis and smoking: an evidence-based appraisal.** *Journal of Evidence Based Dental Practice* 2006; 6: 33-41.

Shabrukh K, Taimur K, Kamran HA. **Chronic periodontitis and smoking: Prevalence and dose-response relationship.** *Saudi Med J* 2016; 37: 889-94.

Javed F, Bashir AH, Romanos GE. **Association between environmental tobacco smoke and periodontal disease: a systematic review.** *Envir Res* 2014; 133: 117-22.

Nile CJ, Sherrabeh S, Ramage G, Lappin DF. **Comparison of circulating tumour necrosis factor superfamily cytokines in periodontitis patients undergoing supportive therapy: a case-controlled cross-sectional study comparing smokers and non-smokers in health and disease.** *J Clin Periodontol* 2013; 40: 875-82.

Tymkiw KD, Thunell DH, Johnson GK, Joly S, Burnell KK, Cavanaugh JE. **Influence of smoking on gingival crevicular fluid cytokines in severe chronic periodontitis.** *J Clin Periodontol* 2011; 38: 219-28.

Dietrich T, Bernimoulin JP, Glynn RJ. **The effect of cigarette smoking on gingival bleeding.** *Journal of Periodontology* 2004; 75: 16-22.



Black CE, Huang N, Neligan PC. **Effect of nicotine on vasoconstrictor and vasodilator responses in human skin vasculature.** AJP - Regulatory, Integrative and Comparative Physiology. 2001; 281(4): 1097-1104.

Calsina G, Ramon JM, Echeverria JJ. **Effects of smoking on periodontal tissue.** Journal of Clinical Periodontology. 2002; 29: 771-6.

Persson RE, Kiyak AH, Wyatt CCI, MacEntee M, Persson GR. **Smoking, a weak predictor of periodontitis in older adults.** J Clin Periodontol 2005; 32: 512–17.

Jang AY, Lee JK, Shin JY, Lee HY. **Association between Smoking and Periodontal Disease in Korean Adults: The Fifth Korea National Health and Nutrition Examination Survey (2010 and 2012).** Korean J Fam Med 2016; 37: 117-22.

Susin C, Oppermann RV, Haugejorden O, Albandar JM: **Periodontal attachment loss attributable to cigarette smoking in an urban Brazilian population.** J Clin Periodontol 2004; 31: 951-58.

## ÍNDICE REMISSIVO

### A

Acidente cerebral vascular 113  
Ansiedade 53, 55, 56, 57, 58, 60, 61, 63, 64, 84, 85, 86, 127, 145, 146, 194  
Anticoncepção 113  
Autocuidado 60, 140, 142, 160, 178, 180

### C

Chronic renal insufficiency 38  
Cirurgia bariátrica 26, 27, 28, 29  
Cirurgia geral 121  
Complicações 1, 7, 8, 16, 17, 18, 21, 26, 27, 28, 29, 30, 32, 33, 34, 35, 36, 83, 84, 102, 120, 127, 166, 170, 176, 178, 180, 181, 182  
Complicações vasculares 17  
Controle da frequência 66, 67, 68, 69, 83, 84, 85  
Corpúsculo renal 17  
Cuidador 139, 140, 142, 144, 180, 181, 183

### D

Depressão 53, 55, 56, 58, 60, 61, 63, 86, 145, 146, 179, 194  
Dermatite atópica 145, 146, 147, 148, 149  
Diabetes 3, 12, 16, 17, 26, 27, 32, 33, 34, 35, 36, 37, 39, 102, 164, 165, 166, 167, 168, 170, 171, 172, 173, 174, 175  
Diabetes mellitus 12, 17, 26, 27, 32, 33, 34, 36, 37, 39, 164, 165, 166, 167, 168, 170, 171, 172, 173, 174, 175  
Doença crônica 84, 141  
Doença vascular 113  
Dor 2, 3, 4, 6, 10, 11, 12, 13, 14, 15, 88, 123, 181

### E

Enfermagem perioperatória 121  
Espasticidade muscular 151  
Espectroscopia por emissão pósitrons 19  
Eventos tromboembólicos 84, 113  
Exposição à radiação 70

### F

Família 95, 123, 139, 140, 142, 144, 145, 146, 173, 177, 180, 181, 183, 197  
Fisioterapia 131, 132, 133, 136, 137, 151, 153, 155

## G

Gestão da qualidade 70, 79, 81

Glioma 19, 24, 92, 93, 94, 95, 102, 104, 105, 106, 107, 108, 109, 110, 111, 112

Glioma cerebral 19

Grupamentos metila 92, 93, 96, 97, 98, 103, 104

## H

Homocisteína 93, 99

## I

Incretinas 164, 165, 166, 167, 171, 172, 173, 174, 175

Índice de karnofsky 156

Insulina 165, 166, 167, 168, 170, 171, 172, 173, 174

Isquemia cerebral 67

## L

Longevidade 84

## M

Membro fantasma 10, 11, 12, 13, 15

Metabolismo 23, 92, 93, 94, 95, 97, 98, 99, 100, 101, 103, 104, 105, 107, 167, 169, 173

Metástase cerebral 156, 157, 158, 161, 163

Mineração de dados 26, 27, 28, 29, 32, 36

Miocardiópatia 1, 2, 8

## N

Nefropatia diabética 16, 17

Neurooncologia 19, 21

Neuropatia 16, 17

## O

Obesidade 26, 27, 33, 34, 35, 36, 67, 117, 165, 167, 168, 169, 170, 173, 174

## P

Paralisia cerebral 131, 132, 133, 135, 137, 138, 151, 152, 153, 154, 155

Paraplegia 139, 140, 141, 142, 143

Periodontitis 38, 39, 40, 50, 51, 52

Perioperatório 67, 120, 123, 127

Polimorfismos do folato 93

Profilaxia 67

Proteção radiológica 70, 71, 72, 73, 74, 76, 78, 79, 80, 81

Prurido crônico 145, 146, 148, 149

## R

Reabilitação 15, 131, 137, 140, 141, 143, 144, 151, 155, 183

## S

Segurança do paciente 71, 72, 120, 121, 122, 124, 125, 126, 128, 129

Síndrome do coração partido 2

Smoking 38, 39, 40, 41, 45, 46, 47, 48, 49, 50, 51, 52

## T

Takotsubo 1, 2, 3, 4, 5, 8, 9

Taquiarritmia 84

Tetraplegia 132, 139, 140, 141, 142, 143

Tofacitinib 145, 146, 147, 148, 149

Tomada de decisão clínica 26, 27, 28, 29

Tontura 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63

Transtornos mentais comuns 53, 55, 56, 57, 58, 59, 60, 61, 62, 63, 65

Tratamento 1, 7, 8, 10, 11, 12, 13, 14, 15, 21, 22, 26, 56, 64, 67, 68, 83, 85, 90, 93, 94, 95, 100, 104, 107, 136, 139, 142, 145, 147, 148, 149, 150, 155, 162, 163, 164, 166, 167, 170, 171, 172, 173, 174, 175, 176, 182

Tratamento farmacológico 13, 67, 68

## U

Ultrassonografia doppler transcraniana 157, 158

## V

Valor preditivo de testes 26, 27

Vertigem 53, 54, 55, 56, 57, 58, 59, 60, 62, 63, 64

