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Quality of life and periodontal health of patients submitted to hemodialysis

Qualidade de vida relacionada a saúde bucal de pacientes submetidos a hemodiálise

DOI:10.34119/bjhrv3n4-044

Recebimento dos originais: 07/06/2019
Aceitação para publicação: 09/07/2020

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ABSTRACT
Objective: to evaluate quality of life for periodontal health in patients undergoing hemodialysis at Hospital Vida in Maceió, Alagoas, Brazil. **Methods**: After examination by Research Ethics Committee of Centro Universitário Tiradentes - AL, participants included through convenience sample method, found in hemodialysis at Hospital Vida. General health information, level of education, number of teeth, use of prostheses and periodontal clinical methods were collected through probing. To analyze impact of oral health on quality of life, the Oral Health Impact Profile (OHIP-14) questionnaire was used. Data were analyzed using arithmetic mean. The OHIP-14 answers received a score that were multiplied by specific weight of each question. The results were grouped and presented by descriptive analysis. **Results**: 126 participants with a mean age of 52.8 years were included. Among them, 78 (61.9%) men and 48 (38%) women. The mean number of teeth was 15.9 and, at periodontal probing, mean probing depth of 2.6 mm and clinical attachment level of 1.9 mm were observed. Final code OHIP-14 mean was 9.53. **Conclusions**: After results evaluation, it was possible to observe occurrence of periodontitis in participants, high rates of unsatisfactory dental prostheses, as well as low impact of quality of life in relation to number of teeth and school level.

Keywords: Quality of life, Periodontitis, Hemodialysis, Chronic kidney disease

RESUMO
Objetivo: avaliar a qualidade de vida da saúde periodontal em pacientes em hemodiálise no Hospital Vida em Maceió, Alagoas, Brasil. **Métodos:** Após exame pelo Comitê de Ética em Pesquisa do Centro Universitário Tiradentes - AL, os participantes foram incluídos por método de amostra por conveniência, encontrado em hemodiálise no Hospital Vida. Informações gerais de saúde, nível de escolaridade, número de dentes, uso de próteses e métodos clínicos periodontais foram coletadas por meio de sondagem. Para analisar o impacto da saúde bucal na qualidade de vida, foi utilizado o questionário Oral Health Impact Profile (OHIP-14). Os dados foram analisados por média aritmética. As respostas do OHIP-14 receberam uma pontuação multiplicada pelo peso específico de cada pergunta. Os resultados foram agrupados e apresentados por análise descritiva. **Resultados**: 126 participantes com idade média de 52,8 anos foram incluídos. Entre eles, 78 (61,9%) homens e 48 (38%) mulheres. O número médio de dentes foi de 15,9 e, na sondagem periodontal, foram observados profundidade média de sondagem de 2,6 mm e nível de inserção clínica de 1,9 mm. A média final do código OHIP-14 foi 9,53. **Conclusões:** Após a avaliação dos resultados, foi possível observar ocorrência de periodontite nos participantes, altos índices de próteses dentárias insatisfatórias e baixo impacto da qualidade de vida em relação ao número de dentes e ao nível escolar.

Palavras-chave: Qualidade de vida, Periodontite, Hemodiálise, doença renal crônica

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1 INTRODUCTION

Chronic kidney disease (CKD) consists of a progressive and irreversible change in renal structure, which causes reduction or filtering limitation and increases uremia levels, which is characterized by increased substances in blood [1-3]. This condition, due to high number of toxic substances in blood circulation, causes immunodeficiency and suppressed humoral response [2].

It's included as CKD, chronic renal failure, end-stage renal disease with glomerulonephritis, diabetic and hypertensive nephropathy, and complications associated with hemodialysis and kidney transplantation. Some oral manifestations may be triggered by this disease, such as xerostomia, uremic stomatitis, radiographic changes of the maxillary bones and dental calculus training [4].

When approximately 10% decrease in normal renal function occurs, kidney replacement therapy is necessary to maintain patient survival. Therefore, hemodialysis therapy is one of the techniques capable of performing this replacement by removing excess fluid, electrolytes and uremic toxins through a dialysis membrane [5].

Studies are currently being conducted due to direct association between development of periodontal disease and CKD progressivity [4]. According to Palmer, et al. (2016), conducted to assess severity and prevalence of oral diseases and determine risk factors associated with hemodialysis, the percentage of patients with moderate to severe periodontitis is 40.6% [6]. Periodontal disease has an infectious and inflammatory etiopathogenesis of tooth support tissues[7-9] and has risk factors in common with CKD, such as smoking, uncontrolled diabetes, age and obesity, which coincidentally together exacerbate renal inflammation [1].

In addition to altered physiological conditions, the impairment of daily activities in these patients is notorious, which causes psychological discomfort and becomes an aggravating factor in their quality of life, which has a direct link to health [10]. Widespread poor hygiene and high rates of periodontitis are directly linked to this fact and become a major factor in contributing to such conditions [5].

Due to lack of evidence available in literature, the aim of this study is to evaluate quality of life related to periodontal health in patients undergoing hemodialysis at Hospital Vida in Maceió, in order to determine association between this pathology and their quality of life.

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2 STUDY POPULATION AND METHODOLOGY

The Research Ethics Committee of Tiradentes University Center - AL (UNIT-AL), through approval code 17862919.0.0000.5641, approved this study. Was performed at Hospital Vida using convenience sample method. Individuals participating in this study were previously informed about research intentions and signed Informed Consent Form (ICF). After signing, participants in their own hemodialysis chair answered the questionnaire and then examiner assessed patient's periodontal health.

Patients undergoing hemodialysis and aged ≥ 18 years were included in this study. In addition to socioeconomic information, data on patient's overall health were recorded on a medical record, which included information such as medical treatment, treatment cause, medication use, history of allergies, presence of systemic diseases, and tobacco use.

Oral health information was collected with ambient light, using personal protective equipment and wooden spatula. Data regarding oral health, use of prosthesis, number of teeth, brushing per day and frequency of visits to the dentist were recorded. During periodontal clinical examination, all teeth were probed using the Williams probe. The oral cavity was divided into sextants, and the most severe tooth was recorded, totaling 6 dental elements. Parameters used were: probing depth (PS) and clinical attachment level (CAL).

Then, examiner read all questions from the Oral Health Impact Profile (OHIP-14) questionnaire [11]. For each question, participants had 4 answer options: never, almost never, occasionally, almost always, and often. This questionnaire is an oral health indicator that comprises individual's perception of biopsychosocial impact in oral disorders associated with quality of life. It is originally composed of 49 questions covering seven dimensions of diseases repercussions on quality of life. Its use has been of important relevance to determine preference for care in health services and users [12].

However, Slade (1997) directed a study aiming to simplify OHIP in only fourteen items, to verify if they kept the original OHIP-49 concepts and if this more summarized format presented a good prevalence distribution. At the end of their study, it was proved that items chosen, when compared to the complete one, proved to be effective in contacting the same associations with clinical and sociodemographic factors verified with OHIP-49 [13]. Thus, in this study OHIP was used as simplified with 14 questions.

Data were analyzed using arithmetic mean and participants divided into groups: with periodontitis (presence of periodontal pocket and clinical attachment loss), without periodontitis and edentulous. The OHIP-14 answers received a score that was multiplied by specific weight

of each question: 0 (never), 1 (almost never), 2 (occasionally), 3 (almost always), and 4 (often). The score ranges from zero to 56 points and higher scores represents greater perceived impact on quality of life. At the end of study, values were summed for each participant and related according to general and oral health history. The results were grouped and presented by descriptive analysis.

3 RESULTS

One hundred and thirty participants were evaluated from August to October, 2019. After analysis, four participants were excluded, three of them had complications during hemodialysis and one refused prosthesis removal, totaling 126 patients in final sample. Among them, 83.3% have (DM) or hypertension as underlying disease. Of the total participants, 78 (61.9%) men and 48 (38%) women, and only 2 smokers who did not have periodontitis. The average age was 52.8 years and 67.5% reported not working for issues directly related to the disease, such as: not being able to make effort, routine hemodialysis and lack of courage to perform any type of activity. Figure 1 shows participants educational level

Mean number of teeth was 15.9 and 67.5% of participants use prostheses. Regarding frequency of visits to the dentist, 46.8% do not remember when the last visit occurred, 2.4% never went to the dentist and 42.1% were 1 year or more. During the periodontal probing examination, PS and CAL had mean of 2.6 mm and 1.9 mm, respectively. Mean final code OHIP-14 was 9.53.

Edentulous group (N = 17) had a mean age of 68.8 years and 58.8% used prosthesis, of which 54.5% were unsatisfactory. Mean final code OHIP-14 was 10.47, however, those who did not use prosthesis had mean of 14.83. Table 1 shows the frequency of OHIP-14 responses chosen by participants.

Regarding periodontitis group (N = 24), mean age was 55.9 years and 16.1 teeth. Of these participants, 33.3% use dental prostheses, of which 87.5% were unsatisfactory. Mean PS was 3.5mm and 3.1mm CAL. Among them, 25% had PS > 4 mm. Mean final code OHIP-14 was 12.08. Table 2 shows the frequency of OHIP-14 responses chosen by participants.

Participants without periodontitis (N = 85) had mean age of 48.7 years and 19 teeth. Of these participants, 25.9% use dental prostheses, of which 63.6% were unsatisfactory. Mean PS was 2.3mm and 1.5mm CAL. Mean final code OHIP-14 was 8.62. Table 3 shows the frequency of OHIP-14 responses chosen by participants.

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4 DISCUSSION

The present study aimed to associate quality of life to periodontal health of patients undergoing hemodialysis through descriptive analysis. After evaluating results, it was possible to observe prevalence of periodontitis, high rate of unsatisfactory dental prosthesis, as well as low impact of quality of life in relation to number of teeth and educational level.

In addition, most of the participants evaluated presented DM and hypertension as underlying disease, in agreement with Ruokonen et al. (2016) who reported that the prevalence of CKD is increasing globally due to hypertension, obesity and DM, and is associated with decreased quality of life and premature death [14].

By observing evaluated periodontal parameters, it was possible to detect mean PS of 2.6 mm and CAL of 1.9 mm, being similar to Gupta et al. (2018) results, who evaluated periodontal pattern of CKD patients undergoing dialysis [15]. In addition, in the present study, patients with periodontitis was numerically lower than those without periodontitis.

The first study that investigated association between periodontitis and CKD was conducted by Kshirsagar et al. (2007), and concluded that a patient with severe periodontitis was twice as likely to develop CKD [16]. In a National Health and Nutrition Examination Research (NHASES III) study conducted in 2017 with 13,748 individuals with CKD, Chopra et al. (2019) also concluded that propensity to have peridontitis was higher in this group [1].

A systematic review of 88 studies involving 125 populations estimated that 56.8% of individuals with CKD on dialysis and 31.6% without dialysis in their less severe condition had periodontal disease [17]. Evidence from these studies is not in agreement. with our results, probably due to small number of participants analyzed.

Regarding oral hygiene levels, it was shown in a meta-analysis that most negative oral hygiene levels were in patients undergoing hemodialysis, compared to current studies [18]. This reality was confirmed by number of teeth analysis. In periodontitis group, mean of 16.1 teeth was observed and in group without periodontitis 19 teeth, which approximates value of tooth loss by 50% compared to total number of a complete dentition.

Together with these data, it was possible to associate presence or absence of periodontitis with quality of life, in which participants with periodontitis had OHIP-14 index of 12.08 compared to patients without periodontitis, which was 8.62, verifying that first group showed greater impact on quality of life.

For edentulous participants using prosthesis, final OHIP-14 code was 8.09 with a mean age of 68.2 years. This data agrees with Petry et al. (2019), who states that elderly, despite using

the prosthesis for a long time, and even though they are not efficient in chewing and /or phonation, have already adapted to use, without feeling any harm [19].

Assessing education level, it was observed that 21.4% of participants have not completed high school and 19.8% do not know the alphabet, considered the highest percentages in this regard. This demonstrates a low educational level, a fact that directly interferes quality of life self-perception. Proving the study by Pakpour et al. (2014), who demonstrated that educational level is considered an important socioeconomic indicator [20].

Also, it was possible to notice that, despite evidence of periodontal disease, poor dentist attendance, low number of teeth, high rate of unsatisfactory dental prosthesis and low level of education, overall mean OHIP-14 code was 9.48. This may imply a low level of participants perception regarding oral health, which may lead to health impairment and increased prevalence of periodontal diseases [21]. In addition, according to some authors [22, 23], psychological burden in patients undergoing hemodialysis through difficulties in daily routine, and the fact that impact on quality of life is generally reduced, can further aggravate oral health problems.

Therefore, patients undergoing hemodialysis should receive oral hygiene instructions for bacterial plaque control and period required for return and monitoring of periodontal condition. Individual-level interventions suggest prioritizing national public and social health measures. These policies can have a major impact on clinical parameters of these individuals and their quality of life.

Despite the strong agreement with available literature, the results of this study should be carefully analyzed due to limitations resulting from this methodology, such as: absence of a control group to perform statistical analysis and restriction in periodontal parameters evaluation in only one tooth per patient sextant.

5 CONCLUSION

Given analysis of scientific literature and results obtained through this study, added to its limitations, it was possible to suggest that chronic renal patients on hemodialysis have poor oral health. The lack of perception about this subject may be directly related to treatment impact on their daily routine, together with psychological factors involved and low education level in question, making oral hygiene care not a priority.

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TABLES

Table 1: OHIP-14 response fequency of edentulous participants.

Dimensions	Never/Hardly ever N (%)	Occasionally N (%)	Fairly often/Very Often N (%)
Functional limitation			
Trouble pronouncing words	13 (76.5)	2 (11.8)	2 (11.8)
Worsened sense of taste	11 (64.7)	4 (23.5)	2 (11.8)
Physical pain			
Aching in mouth	13 (76.5)	4 (23.5)	0 (0)
Discomfort eating food	10 (58.8)	2 (11.8)	5 (29.4)
Psychological discomfort			
Feeling self-conscious	12 (70.6)	1 (5.9)	4 (23.5)
Feeling tense	14 (82.3)	2 (11.8)	1 (5.9)
Physical disability			
Poor diet	10 (58.8)	4 (23.5)	3 (17.6)
Interrupted meals	13 (76.5)	1 (5.9)	3 (17.6)
Psychological disability			
Difficulty relaxing	16 (94.1)	1 (5.9)	0 (0)
Embarrassment	9 (52.9)	6 (35.3)	2 (11.8)
Social disability			
Irritability	14 (82.3)	3 (17.6)	0 (0)
Difficulty doing usual jobs	14 (82.3)	1 (5.9)	2 (11.8)
Handicap			
Life less satisfying	14 (82.3)	1 (5.9)	2 (11.8)
Inability to function	14 (82.3)	1 (5.9)	2 (11.8)

Table 2: OHIP-14 response fequency of participants with periodontitis

Dimensions	Never/Hardly ever N (%)	Occasionally N (%)	Fairly often/Very Often N (%)
Functional limitation			
Trouble pronouncing words	21 (87.5)	3 (12.5)	0 (0)
Worsened sense of taste	21 (87.5)	2 (8.3)	1 (4.2)
Physical pain			
Aching in mouth	13 (54.2)	6 (25)	5 (20.8)
Discomfort eating food	12 (50)	5 (20.8)	7 (29.2)
Psychological discomfort			
Feeling self-conscious	12 (50)	5 (20.8)	7 (29.2)
Feeling tense	15 (62.5)	4 (16.7)	5 (20.8)
Physical disability			
Poor diet	17 (70.8)	4 (16.7)	3 (12.5)
Interrupted meals	20 (83.3)	2 (8.3)	2 (8.3)
Psychological disability			
Difficulty relaxing	22 (91.7)	1 (4.2)	1 (4.2)
Embarrassment	12 (50)	4 (16.7)	8 (33.3)
Social disability			
Irritability	21 (87.5)	3 (12.5)	0 (0)
Difficulty doing usual jobs	19 (79.2)	2 (8.3)	3 (12.5)
Handicap			
Life less satisfying	17 (70.8)	5 (20.8)	2 (8.3)
Inability to function	21 (87.5)	1 (4.2)	2 (8.3)

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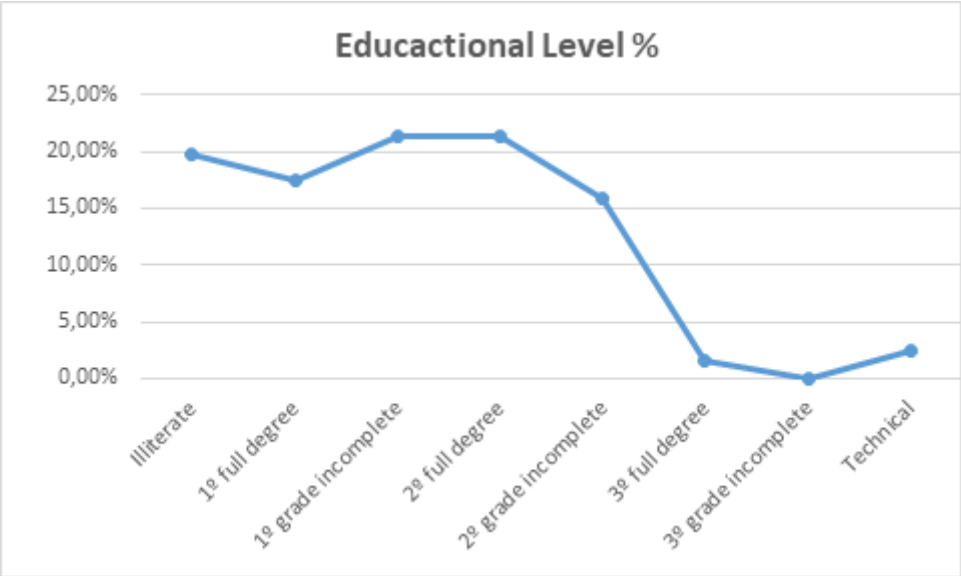
Table 3: OHIP-14 response fequency of participants without periodontitis

Dimensions	Never/Hardly ever N (%)	Occasionally N (%)	Fairly often/Very Often N (%)
Functional limitation			
	76 (89.4)	3 (3.50)	6 (7.1)
Worsened sense of taste	63 (74.1)	17 (20)	5 (5.9)
Physical pain			
Aching in mouth	48 (56.5)	23 (27.1)	14 (16.5)
Discomfort eating food	58 (68.2)	17 (20)	10 (11.8)
Psychological discomfort			
Feeling self-conscious	57 (67.1)	20 (23.6)	8 (9.3)
Feeling tense	60(70.6)	15 (17.6)	10 (11.8)
Physical disability			
Poor diet	74(87.1)	4 (4.7)	7 (8.2)
Interrupted meals	68 (80)	11 (12.9)	6 (7.1)
Psychological disability			
Difficulty relaxing	73 (85.9)	10 (11.8)	2 (2.3)
Embarrassment	51(60)	15 (17.6)	19 (22.4)
Social disability			
Irritability	77(90.6)	4 (4.7)	4 (4.7)
Difficulty doing usual jobs	82(96.5)	1 (1.2)	2 (2.3)
Handicap			
Life less satisfying	71 (83.5)	9 (10.6)	5 (5.9)
Inability to function	82 (96.5)	2 (2.3)	1 (1.2)

Figure1: Educational level of the participants



REFERENCES

1. Chopra, A. and K. Sivaraman, *An update on possible pathogenic mechanisms of periodontal pathogens on renal dysfunction.* Crit Rev Microbiol, 2019: p. 1-25.
2. Pallos, D., et al., *Salivary markers in patients with chronic renal failure.* Arch Oral Biol, 2015. **60**(12): p. 1784-8.
3. Proctor, R., et al., *Oral and dental aspects of chronic renal failure.* J Dent Res, 2005. **84**(3): p. 199-208.
4. Kim, Y.J., et al., *Evaluation of periodontal condition and risk in patients with chronic kidney disease on hemodialysis.* Einstein (Sao Paulo), 2017. **15**(2): p. 173-177.
5. Miyata, Y., et al., *Periodontal Disease in Patients Receiving Dialysis.* Int J Mol Sci, 2019. **20**(15).
6. Palmer, S.C., et al., *Patterns of oral disease in adults with chronic kidney disease treated with hemodialysis.* Nephrol Dial Transplant, 2016. **31**(10): p. 1647-53.
7. Armitage, G.C., *Development of a classification system for periodontal diseases and conditions.* Ann Periodontol, 1999. **4**(1): p. 1-6.
8. Caton, J.G., et al., *A new classification scheme for periodontal and peri-implant diseases and conditions - Introduction and key changes from the 1999 classification.* J Periodontol, 2018. **89 Suppl 1**: p. S1-S8.
9. Socransky, S.S. and A.D. Haffajee, *The Bacterial Etiology of Destructive Periodontal Disease: Current Concepts.* J Periodontol, 1992. **63 Suppl 4S**: p. 322-331.
10. Reissmann, D.R., et al., *Association between perceived oral and general health.* J Dent, 2013. **41**(7): p. 581-9.
11. Slade, G.D. and A.J. Spencer, *Development and evaluation of the Oral Health Impact Profile.* Community Dent Health, 1994. **11**(1): p. 3-11.
12. ALMEIDA, A., LOUREIRO, CA, ARAÚJO, VE., *Um estudo transcultural de valores de saúde bucal utilizando o instrumento OHIP-14 (Oral Health Impact Profile) na forma Simplificada.* UFES Rev Odontol, 2004. **6**.

13. Slade, G.D., *Derivation and validation of a short-form oral health impact profile.* Community Dentistry and Oral Epidemiology, 1997. **25**(4): p. 284-290.

14. Ruokonen, H., et al., *Oral Health and Mortality in Patients With Chronic Kidney Disease.* Journal of Periodontology, 2017. **88**(1): p. 26-33.

15. Gupta, R., et al., *Comparative Evaluation of Periodontal Status of Chronic Renal Failure Patients and Systemically Healthy Individuals.* J Contemp Dent Pract, 2018. **19**(3): p. 324-330.

16. Kshirsagar, A.V., et al., *Antibodies to periodontal organisms are associated with decreased kidney function. The Dental Atherosclerosis Risk In Communities study.* Blood Purif, 2007. **25**(1): p. 125-32.

17. Grubbs, V., et al., *The Kidney and Periodontal Disease (KAPD) study: A pilot randomized controlled trial testing the effect of non-surgical periodontal therapy on chronic kidney disease.* Contemp Clin Trials, 2017. **53**: p. 143-150.

18. Ruospo, M., et al., *Periodontitis and early mortality among adults treated with hemodialysis: a multinational propensity-matched cohort study.* BMC Nephrol, 2017. **18**(1): p. 166.

19. Petry, J., A.C. Lopes, and K. Cassol, *Autoperception of food conditions of elderly dental prosthetic users.* Codas, 2019. **31**(3): p. e20180080.

20. Pakpour, A.H., et al., *A case-control study on oral health-related quality of life in kidney disease patients undergoing haemodialysis.* Clin Oral Investig, 2015. **19**(6): p. 1235-43.

21. Schmalz, G., et al., *Oral health-related quality of life in patients on chronic haemodialysis and after kidney transplantation.* Oral Dis, 2016. **22**(7): p. 665-72.

22. Landreneau, K., K. Lee, and M.D. Landreneau, *Quality of life in patients undergoing hemodialysis and renal transplantation--a meta-analytic review.* Nephrol Nurs J, 2010. **37**(1): p. 37-44.

23. Pagels, A.A., et al., *Health-related quality of life in different stages of chronic kidney disease and at initiation of dialysis treatment.* Health Qual Life Outcomes, 2012. **10**: p. 71.