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Original Article

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The Effect of Oral Health Care and Training in Patients Undergoing Dialysis on the Prevention of Intraoral Complications*

Belkız Kızıltan[1], Merdiye Şendir[2]

[1]Department of Nursing, Eurasia University Faculty of Health Sciences, Trabzon, Türkiye
[2]Department of Nursing, University of Health Sciences Faculty of Nursing, İstanbul, Türkiye
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ABSTRACT

Objective: This study aims to determine the effects of oral health care and education on the prevention of intraoral complications in patients undergoing dialysis.
Methods: In this study, a quasi-experimental pretest/post-test control group design was adopted. The patients in the study group performed oral care for 4 weeks, brushing twice a day and flossing once a day, in line with oral healthcare education. The control group did not receive any training.
Results: It was found that the tooth brushing habits decreased as the education level decreased (P = .009), the frequency of oral care decreased after the beginning of dialysis (P = .011), and the patients who regularly brushed their teeth before dialysis could not brush their teeth as often after starting dialysis because of a "lack of time" (P = .000). Plaque index and gingival index scores were found to be lower after oral care practices and education in the study (P = .000). These scores were higher in the control group that did not apply any oral care practices (P = .000).
Conclusion: In conclusion, it was determined that oral health care and education have a positive effect on relieving and preventing intraoral complications.
Keywords: Complications, dialysis, evidence-based health care, hemodialysis, oral health

Corresponding author: Belkız Kızıltan ✉ or-belkis@hotmail.com
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INTRODUCTION

Oral health, which is an important component of general health, is adversely affected by chronic kidney disease (CKD).[1] In dialysis patients, intraoral changes may occur as a consequence of CKD itself or in connection with related medical treatments, treatment modality, and poor oral care.[1,2] Over 30 oral symptoms are observed in patients with kidney failure (KF), and an estimated 90% of patients have 1 or more of these symptoms.[2] The literature review shows that the most common oral problems in KF are gingival enlargement, other gingival changes (paleness, bleeding), periodontal changes, saliva changes, plaque, calculus, halitosis, taste disorders, and changes in tongue and mucosa.[2-5] In addition, it has also been observed that intraoral changes occur and periodontal disease progress with the start of dialysis treatment in CKD patients.[3] Progression in the severity of the periodontal disease has been reported during pre-dialysis, peritoneal dialysis (PD), and hemodialysis (HD), respectively.[3,4]

Many studies suggest that oral hygiene is worse in CKD patients[2,6] and HD patients[2] compared to the normal population and that poor oral hygiene in patients with CKD is an important problem that is overlooked even though it is commonly seen.[5,7]

The consequences of poor oral hygiene in patients with CKD can be serious. As a result of advanced age, concomitant diseases, weakened immune systems, concomitant medications, periodontitis, and other dental conditions, the risk for systemic outcomes increases,

making the patients particularly susceptible to infection-related diseases.[7] These infections may also endanger the transplant patient's life and cause rejection of the graft.[5] Furthermore, it has been reported that there is a relationship between the grade of periodontitis and mortality in dialysis patients.[8,9] Studies have reported that poor oral hygiene increases plaque volume, periodontal disease formation, gingivitis and periodontitis, and calculus.[2,4,5]

Addy et al[10] emphasized the necessity of regular brushing for plaque control and preventing periodontal diseases. Similarly, Levine and Stillman-Lowe[11] report that tooth brushing is the single most important method in plaque control. In addition, effective tooth brushing is considered a basis for the prevention of gingivitis.[11] While healthy individuals meet their oral care needs in line with their knowledge and skills, they may become dependent on another individual to practice health care in case of an illness. In this context, it is the responsibility of health professionals to promote and maintain the oral health of individuals, help acquire oral hygiene habits, prevent treatment-related complications, and provide counseling and education.[12] This responsibility of the professionals becomes even more prominent in patients receiving dialysis treatment, which causes many complications. The ability of healthcare professionals to perform all these practices depends on their knowledge and skills in assessing the oral health of the patient, using appropriate assessment tools, and developing evidence-based effective oral care protocols.[13,14]

This study was planned to investigate the effectiveness of oral care and education in preventing intraoral complications in dialysis patients. This study provides evidence for the necessity of oral care practices in reducing and eliminating intraoral complications in dialysis patients and will help perform these practices in a more effective and high-quality manner.

METHODS

In this study, a quasi-experimental pretest/post-test control group design was adopted. The study included 622 patients with KF, who received regular dialysis treatment for 1 year before the study. In the power analysis performed using the G*Power (v3.1.7) program to determine the sample size, it was decided that there should be at least 26 people in each group, and considering that there may be losses during the study process, it was deemed appropriate to take 30 people each.

The study sample consisted of dialysis patients with KF, who were willing to participate in the study, open to communication and cooperation, aged between 18 and 65 years old, and without full dentition.[15,16]

All dialysis patients who met the sample selection criteria and volunteered to participate in the study were included in the study. However, 3 patients who could not maintain regular oral care, and 1 patient who travelled to another city were excluded from the sample. Four other patients who met the sample selection criteria were included in the study.

This study was conducted in a training and research hospital, a university hospital, and 2 private dialysis centers between September 2015 and November 2016. Ethical committee approval was received from the Ethics Committee of Trabzon Kanuni Training and Research Hospital (Approval no: 23618724, Date: 09.06.2015). Written informed consent was obtained from the patients who agreed to take part in the study.

Data Collection

Data were collected in cooperation with the dialysis unit's responsible healthcare professionals with the consent and participation of the patients who met the sampling selection criteria. In order to use the indexes that determine the effectiveness of oral care, collaboration was made with the dentist. The indexes were performed with a single dentist while the patients were on dialysis sessions to avoid being affected by individual differences.

As a data collection tool, the Patient Information Collection Form, gingival index (GI),[17] and plaque index (PI) form[18] were used.

Research data were collected by the researcher using the Patient Information Collection Form, which was created by scanning the literature[15,16] and submitted to the "expert panel" (nephrologist, dialysis nurse, dentist) to obtain opinions on the content. In addition to sociodemographic data, a total of 19 questions about disease characteristics such as the presence of regularly taken medications, oral care training, the time before dialysis, the frequency of tooth brushing after dialysis, duration of CKD, and dialysis duration were also included. The form was completed by the researcher in a face-to-face interview and took approximately 15 minutes to fill.

The PI was evaluated according to the Silness and Löe[18] system. This system assesses the plaque thickness at the cervical tooth margin (closest to the gum) and has 4 scores. This

MAIN POINTS

- The majority of patients did not receive any training in oral care.
- After starting dialysis, the frequency of oral care practices decreased.
- Intraoral complications decreased in the study group after oral care practices and training.
- Oral health assessment forms and standardized oral care protocols for chronic kidney disease and kidney failure patients should be developed and implemented with an interdisciplinary team approach.
- Patients should be provided with opportunities for oral care practices during dialysis sessions.

index is particularly suitable for studying the effect of bacterial plaque on gingivitis. The values determined in the average PI value of that individual are obtained by taking the mathematical average.

- 0. No plaque in the gingival area.
- 1. A film of plaque adhering to the free gingival margin and adjacent area of the tooth. The plaque may be recognized only by running a probe across the tooth surface.
- 2. Moderate accumulation of soft deposits within the gingival pocket and on the gingival margin and/or adjacent tooth surface, which can be seen by the naked eye.
- 3. Abundance of soft matter within the gingival pocket and/or on gingival margin.

The GI of the tooth is calculated by summing the values obtained and dividing by 4. By adding these values and dividing them by the number of teeth, the individual score is obtained.[17]

- 0. No inflammation, healthy gingiva.
- 1. Mild inflammation, slight change in color, slight edema, and bleeding on palpation.
- 2. Moderate inflammation, glazing, redness and edema, and bleeding on palpation.
- 3. Severe inflammation, marked redness and hypertrophy, ulceration, and the tendency to spontaneous bleeding.

Oral Care Training and Patient Training Guide

The patients were given a Patient Training Guide prepared by the researcher in accordance with the literature, and the information about tooth brushing at least twice a day and flossing once a day was explained.[12,13,19-21] The guide content includes the following steps.

A small amount of toothpaste was put on the toothbrush, the toothbrush was placed on the posterior teeth of the model at a 45° angle. The upper end of the bristles of the brush was placed just below the gums in such a way that it could affect the gingival sulcus between the tooth and the gum, and the teeth were brushed in a circular motion from top to bottom in the upper jaw and from bottom to top in the lower jaw. This movement was repeated at least 10 times for the outer parts of the teeth. Then, after applying 10 times to the anterior region and other regions, the brushing process was switched to the inner parts of the teeth and the brushing process was terminated with an average brushing time of at least 2 minutes. Following the tooth brushing process, the individual was told that the tongue surface should also be brushed from the back surface of the tongue to the front.

Approximately 30 cm of waxed dental floss was taken, wrapped around the middle finger of both hands, stretched with the help of the index finger and thumb, and used. A part of the thread was passed through the interdental area with slow strokes and in a controlled manner, leaving a part of the thread in the center. The necessity of avoiding hard and sudden strokes that could injure the gums was explained. In order to clean the interfacial areas of the teeth, the floss was placed between the tooth on 1 side and moved back and forth and up and down in a C shape; then, the same movement was performed by entering the same interdental area and holding it against the other tooth. When moving from 1 tooth to another, a clean piece of string was unwrapped from the finger holding more string and the used string was wrapped around the finger on the other hand, so that clean string was used for each tooth. This procedure was first performed on a dental model and took approximately 15-20 minutes.

Research Process

After obtaining patients' consent, the principal investigator, who was not involved in the study, created a randomization list for random allocation according to sessions and centers in the computer environment. They were then numbered sequentially, placed in opaque plastic bags, and grouped according to the centers. This sequence was followed for each session, and the patient assignment was terminated when the sample size for each group was reached. The control group was completed the first.

Patients were interviewed 3 times in the first week of the study. In the first interview, patients were asked to sign a consent form according to the study groups. The PI and GI scores were determined and recorded on the Study/Control Group Patient Follow-up Form by the researcher. For oral care practices, the researcher explained tooth brushing and flossing to the patients, demonstrated them on a tooth model, and enabled the patients to practice. "Patient Training Guide," fluoride toothpaste, a toothbrush with soft slightly inclined bristles, a brush head, and dental floss were distributed. "Patient Information Collection Form" data were recorded in the second and third interviews. The control group received no similar treatment. Patients in the study group were interviewed about whether they continued oral care following the training given at the first encounter, and feedback was obtained. Oral care training was given again in line with their deficiencies.

In the second, third, and fourth weeks, the Study/Control Group Patient Follow-up Form was completed by face-to-face interview with the patients in any session once. In addition, the patients in the study group were contacted by telephone, and their oral care practices and equipment requirements were monitored and supported. At the first dialysis session of the fifth week, PI and GI scores were determined and recorded on the Study/Control Group Patient Follow-up Form. The dentist performing the PI and GI (pretest and post-test) assessments remained unbiased to group assignments.

Statistical Analysis

The power of the study is expressed as 1-β (probability of β = type II error), and in general, the studies should have 80% power. According to Cohen's effect size coefficients, calculations were

made assuming that the evaluations between 2 independent groups would have a large effect size ($d = 0.8$).

Statistical analysis of the data was performed in a computing environment by using the Statistical Package for the Statistical Package for the Social Sciences (IBM SPSS Corp.; Armonk, NY, USA) 22.0 package program, descriptive analyses, chi-squared test, paired samples *t*-test, Wilcoxon signed-rank test, independent samples *t*-test, and Mann–Whitney *U*-test. Results were evaluated at a 95% CI, $P < .05$ significance level, and $P < .01$ and $P < .001$ advanced significance level.

Ethical Considerations

First, in order to conduct the research, ethics approval (decision number: 23,618,724) was received from the Clinical Research Ethics Committee of Trabzon Kanuni Training and Research Hospital. Before starting the study, written informed consent was obtained from the patients after the necessary explanations were made to the nurses about the purpose and execution of the study.

RESULTS

It was found that 53.3% of the study group and 43.3% of the control group were mostly in the 34-49 age group, 63.3% of the patients in the study group and 56.7% of those in the control group were male, 43.3% of the study group were graduates of secondary education, 36.6% of the control group were graduates of primary education, and the majority of the individuals in the study (33.3%) were primary school graduates, 70% of the study group and 56.7% of the control group were married, the majority of the patients (35%) were retired, 63.3% had children, 50% of the study group and 56.7% of the control group lived in the province, and most of the patients in the study group (56.7%) and control group (63.3%) had income equal to their expenses (Table 1). It was found that there was no statistically significant difference between the groups in terms of sociodemographic characteristics, and the sociodemographic characteristics of the patients in both groups were similar to each other ($P > .05$).

When the duration of CKD of the individuals in the study was analyzed, it was observed that 40% of the patients in the study group and 46.7% of the patients in the control group ranged between 2 and 5 years, and the average duration of the disease was 7 years in both the study and control groups. It was found that all patients (100%) participating in the study received hemodialysis treatment, 43.3% of the study group patients and 33.3% of the control group patients received dialysis treatment for periods ranging from 2 to 5 years, and the average duration of dialysis treatment of all patients was approximately 6 years, 86.7% of the study group and 93.3% of the control group received dialysis treatment for 4 hours 3 days a week, and most patients (58.3%) in both groups used at least 1 drug (study 13.3%—control 16.7% calcium channel blocker) (Table 2). There

Table 1. Distribution of Sociodemographic Characteristics of the Patients (N = 60)

Characteristics	Study Group (n = 30)	Control Group (n = 30)	Total (n = 60)	*P*
Age, n (%)				
18-33	4 (13.3)	8 (26.7)	12 (20.0)	.336
34-49	16 (53.3)	13 (43.3)	29 (48.3)	
50-65	10 (33.3)	9 (30.0)	19 (31.7)	
X ± SD	42.06 ± 9.94	41.70 ± 1.24	41.88 ± 11.18	
Gender, n (%)				
Female	11 (36.3)	13 (43.3)	24 (40.0)	.858
Male	19 (63.3)	17 (56.7)	36 (60.0)	
Education, n (%)				
Literate	5 (16.7)	8 (26.6)	13 (21.7)	.892
Primary education	9 (30.0)	11 (36.6)	20 (33.3)	
Secondary education	13 (43.3)	5 (16.6)	18 (30.0)	
High education	3 (10.0)	6 (20.0)	9 (15.0)	
Marital status, n (%)				
Single	9 (30.0)	13 (43.3)	22 (36.7)	.376
Married	21 (70.0)	17 (56.7)	38 (63.3)	
Occupational status, n (%)				
Housewife	6 (20.0)	9 (26.7)	15 (25.0)	.251
Retired	12 (40.0)	9 (33.3)	21 (35.0)	
Employee	1 (3.3)	1 (3.3)	2 (3.3)	
Officer	3 (10.0)	4 (13.3)	7 (11.7)	
Self-employment	7 (23.3)	6 (20.0)	13 (21.7)	
Other (student)	1 (3.3)	1 (3.3)	2 (3.3)	
Status of having a child, n (%)				
No	9 (30.0)	13 (43.3)	22 (36.7)	.284
Yes	21 (70.0)	17 (56.7)	38 (63.3)	
Place of residence, n (%)				
Village	2 (6.7)	4 (13.3)	6 (10.0)	.696
County	13 (43.3)	9 (30.0)	22 (36.6)	
Province	15 (50.0)	17 (56.7)	32 (53.3)	
Income status, n (%)				
Income less than expenses	10 (33.3)	9 (30.0)	19 (31.7)	.637
Income equal to expenses	17 (56.7)	19 (63.3)	36 (60.0)	
Income more than expenses	3 (10.0)	2 (6.7)	5 (8.3)	

X, mean.

Table 2. Distribution of CKD and Dialysis Treatment Characteristics of Patients (N = 60)

Characteristics	Study Group (n = 30)	Control Group (n = 30)	Total (n = 60)	*P*
CKD duration, n (%)				.246
0-1 years	2 (6.7)	4 (13.3)	6 (10.0)	
2-5 years	12 (40.0)	14 (46.7)	26 (43.3)	
6-9 years	4 (13.3)	4 (13.3)	8 (13.3)	
10-14 years	9 (30.0)	2 (6.7)	11 (18.3)	
15 years or more	3 (10.0)	6 (20.0)	9 (15.0)	
X ± SD	7.4 ± 4.8	7.1 ± 6.5	7.3 ± 5.7	
Dialysis type, n (%)				
Hemodialysis	30 (100.0)	30 (100.0)	60 (100.0)	
Dialysis duration, n (%)				
0-1 years	3 (10.1)	9 (30.0)	12 (20.0)	.112
2-5 years	13 (43.3)	10 (33.3)	23 (38.3)	
6-9 years	6 (20.0)	4 (13.3)	10 (16.7)	
10-14 years	7 (23.3)	4 (13.3)	11 (18.3)	
15 years or more	1 (3.3)	3 (10.1)	4 (6.7)	
X ± SD	6.5 ± 4.4	5.3 ± 5.2	5.9 ± 4.8	
Dialysis session, n (%)				
3 days 4 hours	26 (86.7)	28 (93.3)	54 (90.0)	.556
2 days 4 hours	4 (13.3)	2 (6.7)	6 (10.0)	
Drug use status, n (%)				
No	17 (56.7)	18 (60.0)	35 (58.3)	.176
Yes	13 (43.3)	12 (40.0)	25 (41.7)	
Drug used, n (%)				
Calcium channel blocker	4 (13.3)	5 (16.7)	9 (36.0)	-
IV vitamin D	2 (6.7)	1 (3.3)	3 (12.0)	
Parenteral iron	2 (6.7)	1 (3.3)	3 (12.0)	
ESA	1 (3.3)	0 (0.0)	1 (4.0)	
Beta-blocker	1 (3.3)	4 (13.3)	5 (20.0)	
Calcium acetate	2 (6.7)	1 (3.3)	3 (12.0)	
ACE inhibitor	1 (3.3)	0 (0.0)	1 (4.0)	

CKD, chronic kidney failure; IV, intravenous; ESA,erythopoiesis-stimulating agent; ACE,angiotensin-converting enzyme; *X*, mean.

Table 3. Training Status of Patients on Oral Care Practices and Tooth Brushing Features (N = 60)

Features	Study Group (n = 30)	Control Group (n = 30)	Total (n = 60)	*P*
Getting an education, n (%)				
No	22 (73.3)	23 (76.7)	45 (75.0)	.896
Yes	8 (26.7)	7 (23.3)	15 (25.0)	
Place of education, n (%)				
Hospital	0 (0.0)	0 (0.0)	0 (0.0)	–
School	5 (16.7)	4 (13.3)	9 (60.0)	
Family health center	0 (0.0)	3 (10.0)	0 (0.0)	
Dentist	3 (10.0)	7 (23.3)	6 (40.0)	
Pre-dialysis tooth brushing habit, n (%)				.415
Regular	12 (40.0)	14 (46.7)	26 (43.3)	
Occasionally	16 (53.3)	15 (50.0)	31 (51.7)	
None	2 (6.7)	1 (3.3)	3 (5.0)	
Tooth brushing habit after starting dialysis, n (%)				
None	7 (23.3)	6 (20.0)	13 (21.7)	.119
Very rarely	12 (40.0)	21 (70.0)	33 (55.0)	
Occasionally	11 (36.7)	3 (10.0)	14 (23.3)	
Reasons for not brushing regularly after starting dialysis, n (%)				
Laziness and negligence	9 (30.0)	6 (20.0)	15 (25.0)	.598
Inability to habit	4 (13.3)	13 (43.3)	17 (28.3)	
Lack of time	14 (46.7)	10 (33.3)	24 (40.0)	
Does not believe it is helpful	3 (10.0)	1 (3.3)	4 (6.7)	

was no statistically significant difference between the groups in terms of all these characteristics (*P* > .05).

It was found that 73.3% of the patients in the study group and 76.7% of the patients in the control group did not receive any training on oral care, the places where the patients who received training (25%) were schools (60%) and dentists (40%), 53.3% of the study group and 50% of the control group brushed their teeth occasionally before dialysis, 43.3% of the patients brushed their teeth regularly, 40% of the patients in the study group and 70% of the patients in the control group brushed their teeth very rarely after starting dialysis, and 46.7% of the study group stated “lack of time” and 43.3% of the control group stated “lack of habit” as the reason for not brushing their

teeth regularly (Table 3). It was observed that there was no statistically significant difference between the groups in terms of characteristics related to oral care ($P > .05$).

When the factors that may affect the oral care practices of the patients were examined, it was found that tooth brushing habits decreased as the level of education decreased ($P = .009$), oral care frequency decreased after starting dialysis compared to before starting dialysis ($P = .011$), and patients who brushed their teeth regularly before dialysis (76.9%) could not brush their teeth regularly after starting dialysis because of "lack of time" ($P = .000$).

It was found that there was a statistically significant difference between PI and GI scores measured before and after oral care practices and training in the study group patients, and PI and GI scores were lower after oral care practices and training ($P < .001$). It was observed that the post-test PI and GI mean scores of the control group patients were higher than the pretest scores and there was a statistically significant difference between them ($P < .001$). When the mean PI scores of the dialysis patients in the study were compared, it was observed that there was a significant difference between the groups in PI pretest and post-test mean scores ($P < .05$) (Table 4).

When the mean GI scores of the dialysis patients within the scope of the study were compared, it was found that while the mean GI pretest scores showed a significant difference between the groups ($P < .05$), there was no significant difference in the mean GI post-test scores ($P > .05$) (Table 4).

Table 4. Comparison of Pretest and Post-Test PI-GI Score Means (N = 60)

	Groups		Test
	Study mean ± SD	Control mean ± SD	*P*
PI score			
Pretest	1.94 ± 05.6	1.50 ± 0.33	3.706[b] .000**
Post-test	1.40 ± 0.38	16.0 ± 0.29	−2.288[b] .026*
Test *P*	5.159[a] .000**	−5.194[a] .000**	
GI score			
Pretest	1.44 ± 0.56	1.09 ± 0.24	3.142 .003*
Post-test	1.14 ± 0.49	1.19 ± 0.28	417.500[d] .630
Test *P*	5.159[a] 0.000**	−6.034[c] 0.000**	

GI, gingival index; PI, plaque index.
[a]Paired samples *t*-test.
[b]Independent samples *t*-test.
[c]Wilcoxon signed-rank test.
[d]Whitney *U*-test.
*$P < .05$; **$P < .001$.

Table 5. Pretest Post-Test Comparison of PI and GI Score Mean Differences (N = 60)

Groups	PI mean ± SD	GI mean ± SD
Study	−0.54 ± 0.48	−0.30 ± 0.32
Control	0.10 ± 0.11	01.0 ± 00.9
T	−7.168	−6.580
P	.000**	.000**

GI, gingival index; PI, plaque index.
**$P < .001$.

When the difference between pretest and post-test PI and GI mean scores of the patients were analyzed, it was found that PI and GI mean scores decreased in the study group and increased in the control group. This difference between them was statistically highly significant ($P < .001$) (Table 5).

DISCUSSION

Oral health, which is adversely affected by KF, may be impaired in dialysis patients as a result of the disease itself or related medical treatments, treatment modality, and poor oral care.[1,2] When the literature was examined, it was observed that oral hygiene was worse in CKD and dialysis patients compared to the normal population, and this increased plaque volume, calculus, and periodontal disease formation; gingivitis, and periodontitis.[2,4,6] In this sense, it is emphasized in the literature that regular tooth brushing, which is one of the oral care practices and a nursing effort, is the only and the most important method for plaque control and prevention of periodontal diseases.[10,11,13,14]

The findings obtained in the study regarding the sociodemographic characteristics of the patients are compatible with the findings of other studies with dialysis patients as the sample.[22,23]

In our study, it was determined that the majority of the patients in the study and control groups did not receive oral care education, there was no statistically significant difference between them, and oral care education was mostly received from the dentist. In the study conducted by Gökalp et al[24] to determine the oral and dental health profile of adults and the elderly in Turkey, it was observed that the percentage of those who did not have a toothbrush was very high at all ages. In our study, it is thought that this situation may negatively affect the habituation of oral care practices due to the high rate of those who did not receive training on oral care.

In similar studies with dialysis patients as the sample, the tooth brushing habits of the patients supported the results of our study.[2,25] In addition, it was observed in our study that the tooth

brushing habits of the patients decreased as the level of education decreased (P = .009). When the literature was examined, it was determined that quality of life increased as the level of education increased in dialysis patients. It is thought that as the level of education increases, the understanding of health will change and develop positively, and individuals will assume more responsibility for their health, thus they will learn and use strategies to manage their diseases/symptoms more, and as a result of all these, the quality of life will increase.[26] In line with this information, it can be said that the parallel relationship between the level of education and quality of life of dialysis patients affects oral care habits in the same way.

The fact that the patients receiving dialysis treatment changed their tooth brushing habits when they started dialysis for the lack of time as their reason, and brush their teeth very rarely, which can be considered a negative health behavior and can be considered an inadequate attempt to maintain oral health. In our study, it was found that the frequency of oral care decreased after starting dialysis compared to before they started dialysis (P = .011), and patients who brushed their teeth regularly before dialysis (76.9%) could not brush their teeth regularly after starting dialysis due to "lack of time" (P = .000). When similar studies are examined, it is observed that having a chronic disease such as KF and continuing regular dialysis treatment affects the patient's life physically and psychosocially, and patients are functionally restricted due to physical, emotional, and social factors.[27] These restrictions cause the patients to have to give up their habits and lead to the development of behaviors such as loss of emotion, belief and negative thoughts, inability to adequately perform self-care and vital functions, and passivity.

In the literature, it has been shown that the incidence of periodontal disease increases in chronic dialysis patients, and periodontal diseases increase the severity of systemic disease and cause premature deaths.[28] Microbial dental plaque is the most important etiological factor in the formation of periodontal diseases.[29] Studies emphasizing the importance of oral care in dialysis patients and showing the effect of periodontal diseases on mortality have reported a relationship between the degree of periodontitis and mortality. Kshirsagar et al[4] followed HD patients for 18 months, it was observed that cardiovascular mortality increased 5 times in those with moderate and severe periodontitis. Chen et al[8] reported that there was a significant relationship between the grade of periodontitis and mortality rates in dialysis patients; mortality was 24% in cases with mild periodontitis and 70.6% in cases with severe periodontitis. In addition, it was reported that all deaths in this study were 1.83 times higher in periodontitis cases. On the other hand, increased plaque levels have been reported in many studies focusing on the periodontal health of HD patients.[2,26,30] In the literature, it is stated that tooth brushing twice a day and flossing once a day are required to remove microbial dental plaque from the mouth.[12,19-21] The fact that in our study there was a decrease in the mean PI of the patients in the study group who brushed and flossed regularly for 4 weeks and an increase in the mean PI of the control group patients who did not perform any oral care practice for 4 weeks supported these results. In this context, oral care practices in dialysis patients may reduce the incidence of systemic diseases caused or aggravated by periodontitis.

Gingivitis and periodontitis are common symptoms of poor oral care, their severity increases in relation to HD and is more common in KF patients.[30] In their study of dialysis patients, Borawski et al[3] reported that lack of general oral care is one of the risk factors that may cause periodontal disease in dialysis patients. In a study by Aggarwal et al[29] to comparatively evaluate the effectiveness of 2 different toothbrushes in the removal of supragingival plaque, it was observed that regular tooth brushing for 4 weeks decreased the averages of PI and GI. In our study, the decrease in the mean PI and GI after 4 weeks of regular oral care practices in the study group patients who did not have regular oral care practice habits and the increase in the control group patients were consistent with these results.

The limited number of PD patients in dialysis centers within the scope of this and their unwillingness to participate in the study, and consequently, the sample group consisting only of HD are the limitations of the study.

CONCLUSION

In this study, plaque and gingivitis levels increased in patients in the non-intervention control group and decreased in the study group, and the mean score differences between the groups were significant. This showed that twice-daily tooth brushing and flossing may prevent oral complications and provides positive effects in dialysis patients. Poor oral hygiene increases dialysis-related oral complications, in addition to periodontal disease, which progresses with the onset of dialysis treatment. It is thought that our study results will set an example for evidence-based practices in these patients. In the light of these results, it is recommended that the oral health of patients starting dialysis treatment should be evaluated and oral care practices should be taught using visual and written materials to prevent complications. In addition, oral health assessment forms and standardized oral care protocols should be developed for CKD and KF patients, implemented with an interdisciplinary team approach, and randomized controlled studies should be conducted in this regard.

Ethics Committee Approval: Ethical committee approval was received from the Ethics Committee of Trabzon Kanuni Training and Research Hospital (Approval no: 23618724, Date: 09.06.2015).

Informed Consent: Written informed consent was obtained from the patients who agreed to take part in the study.

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