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Dental Workers' Practice of Oral Care and Use of Oral Hygiene Products for the Elderly

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Abstract

Objective: This study suggests that the necessity of education to self-check and manage oral care, including oral hygiene, by identifying the oral condition of the elderly through a survey of oral care and infection control of dental workers.

Methods: A study was conducted on 112 dental workers working at dental clinics in Gwangju Metropolitan City from March 1 to March 30, 2023. The study participants were calculated with a G. power 3.1 program with an effect size of 0.3, a significance level of 0.05, and a power of 0.95.

The survey participants understood the purpose of the study and agreed to participate in the study, and the survey was conducted in a self-written manner. The frequency analysis and mean and standard deviation of general matters were conducted, and two independent samples t-test according to gender, infection control education * cross-analysis of chlorhexidine toothpaste use, oral management correlation for the elderly, infection control education, and chlorhexidine toothpaste use were analysed by setting a 95% confidence interval.

Results: The two independent samples t-test according to gender and fluoride application during dental care visits were 92 women, with a mean and standard deviation of 2.097 (21.129). Man 20 people, the mean and standard deviation is 3.050 (1.356). Among dental workers' visiting oral care, the t statistics according to gender and fluoride application were -3.293, and the significance probability was .001, indicating that there was a significant difference in gender and fluoride application at the significance level of .05. Infection control education * Chlorohexidine toothpaste use cross-table showed that 63 people said "very not" and 88.75% said "very not" in terms of whether they received and practiced infection control education and 11.1% said "very not." In other words, it was found that the majority of dental workers received infection control education but did not practice it. The correlation between fluoride application and gender.300, fluoride application and tooth brushing is .465, gender and denture brushing .290, fluoride application and denture brushing .392, tooth brushing and denture brushing .373, gender and Chlorohexidine toothpaste use and gender are .215.390, Fluoride application and sugar intake restrictions.392, tooth brushing and sugar intake restrictions.612, denture brushing and sugar intake restriction 290, tooth brushing and fluoride toothpaste use.250, denture brushing and fluoride toothpaste.250, the use of Chlorohexidine toothpaste and the use of fluoride toothpaste were found to be .276, and the correlation between oral management in the elderly was significant at the significance level of .01.

Conclusion: The F notification value of infection control education and regression analysis of chlorhexidine toothpaste use is 4.359, significance probability. Significance level as 038.It is significantly explained in 05 (t = 2.096, p = .038) and the total change is 38% (30% according to the correction coefficient).

Keywords: Dentists; Dental hygienists; Infection control; Dentures; Fluoride application; Elderly; Oral care

Introduction

With the development of medical technology, the average life expectancy is extended due to the improvement of living standards and the expansion of medical services, and the number of elderly people aged 65 or older is rapidly increasing. Due to this increase in the elderly population, interest in the health of the elderly is increasing. The health problems of the elderly are

mostly physical and functional problems, and 89.2% of the elderly have an average of 2.6 chronic diseases [1]. Among them, oral health problems in the elderly are one of the most common physical health problems in the elderly [2]. Oral diseases in the elderly are becoming important. Oral health determines the overall quality of life and is closely related to systemic diseases, so it is important to maintain oral health care. The probability of causing tooth loss, dental caries, and periodontal disease increases [3]. And since oral health conditions deteriorated due to oral diseases in the elderly are closely related to systemic health due to malnutrition as well as oral health, oral health of the elderly can be seen as a factor that directly affects healthy life in old age [4]. The higher the quality of life related to oral health, the higher the quality of life, indicating that oral health is an important factor in the quality of life. Oral health-related quality of life simply means identifying physical, emotional, and social disorders, including dental caries, periodontal disease-free conditions, and subjective oral conditions [5]. In the dental clinic, a lot of saliva or blood-mixed secretions are generated by high-speed rotary mechanisms and drinking water. Dust generation, including various pathogenic microorganisms, is at risk of causing a variety of pathogenic infections, ranging from colds, pneumonia, tuberculosis, hepatitis, and acquired immunodeficiency (AIDS). Developed countries have recognized the importance of infection control in hospitals and are actively conducting research and activities on infection control. Shaw et al [6]. Reported the transmission of hepatitis B between dentists and patients, and Robinson and Challacombe reported the transmission of human immunodeficiency virus (HIV) through dental treatment. In the 1990s, South Korea began systematic infection control activities in earnest [7]. Since then, the Korean Dentist Association has published a guidebook on infection prevention practices recommended for the "dental system" in 1993 to prepare overall clinical guidelines for infection control [8]. In 1985, the American Dental Association issued a recommendation for preventing infection in the dental pore environment [9]. That In 2004, the U.S. Centers for Disease Control and Prevention published infection control guidelines in the dental environment to minimize the spread of infection between patients and staff, staff and patients, and included disinfection of impurities and dental artefacts, and the environment in the dental laboratory [10]. The oral health status of the elderly is causing deterioration of oral health due to reduced authoring and pronunciation functions, which can improve the oral health and quality of life of the elderly by restoring the function of lost teeth due to dental prosthetics [11,12]. Previous studies have shown that chlorhexidine has an effect of inhibiting tooth bacterial membrane regrowth [13,14]. Furthermore, recent systematic studies have shown that both 0.12% chlorhexidine and 0.2% chlorhexidine are useful for reducing the bacterial membrane and gingival index [15]. Recently, chlorhexidine has been actively studied to prevent dental caries by inhibiting Mutans streptococci as well as periodontal treatment. Previous studies have shown that the comparison of chlorhexidine varnish and fluorine vanish shows that chlorhexidine varnish is more effective in inhibiting mutans streptococci, showing its potential for use in preventing dental caries [16]. Therefore, this study suggests that the necessity of education to self-check and manage oral care, including oral hygiene, by identifying the oral condition of the elderly through a survey of oral care and infection control of dental workers.

Materials and Methods

From March 1 to March 30, 2023, a study was conducted on 112 dental workers working at dental clinics in Gwangju Metropolitan City. The number of study participants was calculated as G. power 3.1 program, with an effect size of 0.3, a significance level of 0.05, and a power of 0.95. The survey participants understood the purpose of the study and agreed to participate in the study, and the survey was conducted in a self-written manner. This study was conducted with the consent of IRB (NO 1041223-201912-HR-18) at Honam University's Bio-Science Ethics Committee. The questionnaire was measured on a Likert 5-point scale, and 5 points were given to the Likert 5-point scale "Very Yes" and 1 point to "Very Not" which means that the higher the score, the higher the degree of practice.

Research Tool

For subjective oral health status, the tool was used by modifying and supplementing the translation of the Oral Perception Guide developed by Beck by NA [17].General matters include age, gender, work experience, and infection control education, and a total of 7 questions were fluoride application, brushing teeth, brushing dentures, using chlorhexidine toothpaste, restricting sugar intake, using fluoride toothpaste, and scaling. It was measured on a Likert 5-point scale, and Cronbach's alpha was 0.653 with a total of 7 questions.

Analysis Method

The collected data were analysed using the SPSS (version 21.0, SPSS Inc., Chicago, IL, USA) statistical analysis program. The frequency analysis and mean and standard deviation of general matters were conducted, and two independent samples t-test according to gender, infection control education * cross-analysis of chlorhexidine toothpaste use, oral management correlation for the elderly, infection control education, and chlorhexidine toothpaste use were analysed by setting a 95% confidence interval.

Results

In Table 1, in general, age 20s 36 people 31.6%, 30s 48 people 42.1%, 40s 20 people 18.4%, 50s 3 people 2.6%, 60s 4 people 3.5% and the mean and standard deviation are 2.026(.972). By gender, 92 women were 80.7%, 20 men were 17.5%, and the mean and standard deviation were 1.178 (.384). In terms of working experience, 27 people were 23.7% in the 1st and 2nd years, 37 people in the 3rd and 4th years, 32 people in the 5th and 6th years, 28.1% in the 5th and 8th years, and 83.3% in the 7th and 8th years, and 14.9% in the average and standard deviation are 1.151.

Among dental workers' visiting oral care, the two independent sample t-test according to gender and fluoride application were 92 women, average and standard deviation 2.097 (21.129). Man 20 people, the mean and standard deviation is 3.050 (1.356). Among dental workers' visiting oral care, the t statistics according to gender and fluoride application were -3.293 and significance probability.001, indicating that there was a significant difference in gender and fluoride application at the significance level of .05 (Table 2).

Table 1: *Demographic matters (n=112).*

item	Sub item	percent	mean	S d
age	20s	36/31.6	2.026	.972
	30s	48/42.1		
	40s	21/18.4		
	50s	3/2.6		
	60s	4/3.5		
gender	woman	92/80.7	1.178	.384384)
	man	20/17.5		
Work experience	1or 2years	27/23.7	2.401	1.142
	3or4years	37/32.5		
	5or6years	32/28.1		
	7or8years	8/7.0		
	9or10years	8/7.0		
Infection control education	yes	95/83.3	1.151	.360
	no	17/14.9		

Table 2: *Two independent samples by gender t-test (n=112).*

item	Sub item	n	mean	S d	t	p
fluoride application	woman	92	2.097	21.129	-3.293	.001
	man	20	3.050	1.356		

Table 3: *Infection control education * Cross-analysis of the use of Chlorohexidine Toothpaste (n=112).*

Infection control education * Chlorohexidine toothpaste use cross-table								
			Chlorohexidine toothpaste use					total
			It's not quite.	I don't think so.	In general.	That's right.	It is quite so	
Infection control education	yes	Frequency	32	31	22	7	3	95
		Chlorohexidine toothpaste in use %	88.9%	88.6%	81.5%	100.0%	42.9%	84.8%
	no	Frequency	4	4	5	0	4	17
		Chlorohexidine toothpaste in use %	11.1%	11.4%	18.5%	0.0%	57.1%	15.2%
total		Frequency	36	35	27	7	7	112
		Chlorohexidine toothpaste in use %	100.0%	100.0%	100.0%	100.0%	100.0%	100.0 %

X2 = 11.906 a (d f = 4, p= 0 .018)

Table 4: *Correlation of oral care for the elderly (n-112).*

1	gender	Fluoride-coated	toothbrush	Denture-cleaning	Use chlorohexidine toothpaste	sugar-restricted	fluoride toothpaste
gender	1						
Fluoride-coated	.300**	1				.	
toothbrush		.465**	1				.
Denture-cleaning	.290**	.392**	.373**	1		.	.
Use chlorohexidine toothpaste	.251**	.390**			1		
sugar-restricted		.392**	.612**	.290**		1	
fluoride toothpaste			.250**	.250**	.276**		1
Correlation is significant at 0.01 level (both sides).							

Table 5: *Infection control education and regression analysis of chlorhexidine toothpaste use (n=112)*

Coefficient [a]						
Model		**Non-Standardized Coefficient**		**standardized Coefficient**	**t**	**p**
		B	**Standardization Error**	**β**		
1	(constant)	1.015	.073		13.854	.000
	Use chlorohexidine toothpaste.	.061	.029	.196	2.096	.038
a. Dependent variable: infection control education, R2 (adj, R2) = .38 (.30), F=4.359						

Infection control education * Chlorohexidine toothpaste use cross-table showed that 63 people said "very not" and 88.75% said "very not" in terms of whether they received and practiced infection control education and 11.1% said "very not." In other words, it was found that the majority of dental workers received infection control education but did not practice it (Table 3).

The correlation between fluoride application and gender.300, fluoride application and tooth brushing is .465, gender and denture brushing .290, fluoride application and denture brushing .392, tooth brushing and denture brushing .373, gender and Chlorohexidine toothpaste use and gender are .215.390, Fluoride application and sugar intake restrictions.392, tooth brushing and sugar intake restrictions.612, denture brushing and sugar intake restriction 290, tooth brushing and fluoride toothpaste use.250, denture brushing and fluoride toothpaste.250, Chlorohexidine toothpaste and fluoride toothpaste were shown as .276, and the correlation between oral management in the elderly was significant at the significance level of .01(Table 4).

The F notification value of infection control education and regression analysis of chlorhexidine toothpaste use is 4.359, the probability of significance. Significance level as 038.It is significantly explained in 05 (t = 2.096, p = .038) and the total change is 38% (30% according to the correction factor) (Table 5).

Discussion

Due to the improvement of the national standard of living and the development of medical technology, dental caries of the elderly in an aging society are a disease with higher discomfort in writing. In the correlation between the need for denture according to subjective oral health status, the need for denture was high in the elderly who said it was uncomfortable to chew and talk [18]. Dental workers should be thoroughly aware of infection prevention, require efforts to control and cope with infection and take preventive measures against infectious diseases by examining the patient's medical history and checking the overall health status [19]. In addition, personal protective equipment such as hand washing, gloves, masks, and safety glasses must be worn for each patient's treatment, and proper management such as disinfection and sterilization and removal is required [20]. Elderly people who need help in daily life are reported to have a very low

priority for high-risk groups in oral diseases [21]. The oral condition of the elderly is frequently caused by dental caries and periodontitis due to various factors such as tooth decay and agitation of minority remaining teeth, frequent food entrapment, difficulty in oral hygiene management due to dull hand movements, and oral dryness due to side effects [22]. Relatively mild lesions, such as intraoral dental root and periodontal lesions and abrasions caused by loose dentures in the elderly, sometimes pass through local intradermal infections and lead to life-threatening systemic infections. In particular, periodontal disease can cause bad breath and pain, causing discomfort to others and malnutrition due to a decrease in the amount of food [23]. Periodontal inflammation can increase the risk of cardiovascular disease, stroke [24,25]. Infectious endocarditis, and worsening diabetes through bacterial blood transmission, so preventing oral disease is very important for healthy aging of elderly patients [26]. According to previous studies, dental bacterial index, bad breath, and tongue were continuously reduced in the experimental group mediated in the elderly, and saliva secretion was increased in Choi's study using toothbrushes, interdental brushes, and chlorhexidine [27]. The results showed that patients in the intensive care unit had the ability to suppress plaque, gum bleeding, and candy bacteria in mucosal cleaning, and the bacterial index was significantly reduced in a short-term study conducted by experts after eating once a week. It was small [28]. The F notification value of the infection control education and regression analysis of chlorhexidine toothpaste use in this study was 4.359, significance probability. Significance level as 038. 05 explains significantly ($t = 2.096$, $p = .038$) and the total change is 38% (30% according to the correction factor). According to other previous studies, dental workers' dental care methods, characteristics of the elderly's oral cavity, and how to use oral hygiene products were followed by oral cleaning, denture management, and induction of regular dental visits [29]. In addition, according to previous studies, 'the number of patients is large and busy' showed the highest response rate as a reason for not practicing infection prevention behaviour [30]. In this study, due to the nature of dental treatment, dental hygienists are passive in helping dental staff with treatment hours and the number of patients, so they are aware of infection control and want to practice it, but the busy office environment is considered to be an obstacle to dental hygienists' practice of infection prevention. In order to increase the degree of practice, it is considered necessary to adjust the workload so that the infection control procedure can be carried out. In old age, senile diseases, digestive diseases, and respiratory diseases appear, and oral diseases are also associated with restrictions on the intake of various nutrients and diseases of the digestive system, which is thought to have a secondary effect on systemic health [31]. Previous studies have shown that oral health education for the elderly is also effective , and group education for the elderly also improves brushing and flossing ability and reduces gingival bleeding [32,33]. In this study's infection control education * Chlorohexidine toothpaste use cross-table, 63 people said "very not" and 88.75% said "very not" in terms of whether they received and practiced infection control education, and 4 people said "very not" showed 11.1%. In other words, it was found that the majority of dental workers received infection control education but did not practice it < Table 3>. The need for fluoride application in the elderly has been verified in various studies [34]. In this study, the two independent sample t tests according to gender and fluoride application among dental workers' visiting oral care were 92 women, 2.097 (21.129) mean and standard deviation. Man 20 people, the mean and standard deviation is 3.050 (1.356). Among dental workers' visiting oral care, the t statistics according to gender and fluoride application were -3.293 and significance probability.001, indicating that there was a significant difference in gender and fluoride application at the significance level of .05. Whether the tap water fluoride concentration adjustment project, the expert fluoride application self-fluorinated grapes, said that fluoride intervention could reduce the incidence of dental caries by 0.29 (95% confidence interval [CI], 0.16-0.42) and 0.22 (95% CI, 0.08-0.37) in adults [35]. 5,000 ppm of fluoride toothpaste, 22,600 ppm of fluoride varnish applied, 4% chlorhexidine varnish applied, 5% sodium fluoride varnish applied as a strategy to prevent dental caries in the elderly. It was also proposed to apply the three-month cycle of [36]. In this study, the correlation coefficient between fluoride application and gender.300, fluoride application and tooth brushing is .465, gender and denture brushing.290, fluoride application and denture brushing.373, gender and Chlorohexidine toothpaste use and sex use.215, fluoride application and chlornucidin.390, Fluoride application and sugar intake restrictions.392, tooth brushing and sugar intake restrictions.612, denture brushing and sugar intake restriction 290, tooth brushing and fluoride toothpaste use.250, denture brushing and fluoride toothpaste.250, Chlorohexidine toothpaste and fluoride toothpaste were shown as .276, and the correlation between oral management in the elderly was significant at the significance level of .01 < Table 4>. As the elderly age increases, the association between oral and systemic diseases delays the healing of oral diseases and causes irreversible tooth loss. And these problems are also related to socioeconomic and emotional health. Therefore, active management and help are needed to solve the oral health problem of the elderly. Accordingly, oral health of the elderly is considered to be able to improve oral health of the elderly when dental caries and periodontal diseases occur in old age, and oral disease prevention and oral environment management, that is, oral hygiene products, and chlorhexidine cleanser are used. The limitation of this study is that oral diseases of the elderly appear as cumulative results, and it is difficult to

change the oral health promotion of the elderly and the basic oral health management behaviour of the elderly. [37,38].

Conclusion

From March 1 to March 30, 2023, a study was conducted on 112 dental workers working at dental clinics in Gwangju Metropolitan City. The number of study participants was calculated as G. power 3.1 program, with an effect size of 0.3, a significance level of 0.05, and a power of 0.95. The survey participants understood the purpose of the study and agreed to participate in the study, and the survey was conducted in a self-written manner. The questionnaire was measured on a Likert 5-point scale, and 5 points were given to the Likert 5-point scale "Very Yes" and 1 point to "Very Not" which means that the higher the score, the higher the degree of practice.

1. In general, age 20s 36 people 31.6%, 30s 48 people 42.1%, 40s 20 people 18.4%, 50s 3 people 2.6%, 60s 4 people 3.5%, and the mean and standard deviation are 2.026(.972). By gender, 92 women were 80.7%, 20 men were 17.5%, and the mean and standard deviation were 1.178 (.384). In terms of working experience, 27 people were 23.7% in the 1st and 2nd years, 37 people in the 3rd and 4th years, 32 people in the 5th and 6th years, 28.1% in the 5th and 8th years, and 83.3% in the 7th and 8th years, and 14.9% in the average and standard deviation are 1.151.

2. The two independent samples t-test according to gender and fluoride application among dental workers' visiting oral care were 92 women, 2.097 (21.129) mean and standard deviation. Man 20 people, the mean and standard deviation is 3.050 (1.356). Among dental workers' visiting oral care, the t statistics according to gender and fluoride application were -3.293, and the significance probability was .001, indicating that there was a significant difference in gender and fluoride application at the significance level of .05.

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4. The correlation coefficient between fluoride application and gender.300, fluoride application and tooth brushing is .465, gender and denture brushing .290, fluoride application and denture brushing .373, gender and Chlorohexidine toothpaste use and gender are .215, fluoride application and Chlorohexidine toothpaste use.390, Fluoride application and sugar intake restrictions.392, tooth brushing and sugar intake restrictions.612, denture brushing and sugar intake restriction 290, tooth brushing and fluoride toothpaste use.250, denture brushing and fluoride toothpaste.250, the use of Chlorohexidine toothpaste and the use of fluoride toothpaste were found to be .276, and the correlation between oral management in the elderly was significant at the significance level of .01.

5. The F notification value of infection control education and regression analysis of chlorhexidine toothpaste use is 4.359, the probability of significance. Significance level as 038.It is significantly explained in 05 (t = 2.096, p = .038) and the total change is 38% (30% according to the correction coefficient).

Conflict of Interest

There is no financial support and no conflict of interest.

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