Study on the Relationship between Dental Care and Overall Health Perceived by the Visually Impaired

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Abstract

Background/Objectives: The complexity of dental health has a great influence on the overall health of people. Considering the fact that it is more difficult for the visually impaired to manage their dental condition, the study delves into the relationship between their dental care status and overall health, while looking for ways to improve and complement them. **Methods/Statistical Analysis:** The study utilized the SPSS Win ver. 18.0 program to analyze the frequency of dental care condition and its' related characteristics, the Duncan for the after review of differences among groups, and the multiple regression analysis to figure out the correlation between general characteristics and dental care condition, as well as to find the factors affecting objective health condition. **Findings:** 58.9% replied to not using any dental care products, 42% to replacing their toothbrushes after they wear down, and 90.2% responded as receiving no education related to dental health. Results show that there is a positive relationship to overall health conditions on those living with sons and daughters over living alone, and statistically meaningful differences to illness were shown in the average comparison of health related characteristics and overall health condition. **Improvements/Applications:** The visually impaired, who depends on memory, has outstanding learning ability compared to others with different disabilities. Thus, it is expected that an opportunity to receive education on dental care will increase their ability to manage their own dental health as well as their overall health.

Keywords: Average Life Expectancy, Dental Care, Dental Health Conditions, Overall Health, Visually Impaired

1. Introduction

The development of medical technology, easy accessibility to abundant resources and changes in awareness to hygiene has increased the average life expectancy of people in modern society¹. However, increased life expectancy has led to the increase in aging population, bringing about chronic illness and acquired impairment through various accidents. Such social problems increase interest in living a high quality and healthy life and make people put efforts in staying fit².

A lot of factors and efforts are required to maintain one's health. Nutrition can be considered one of the most important factors among them. In this sense, dental health, which plays a critical role in food consumption can also be considered important. However, the characteristics of the teeth which are limited in one's vision due to the cheeks, make it difficult to be taken care of properly. In this aspect, it is thought that the visually impaired will have more difficulties in main taining their dental health^{3–5}.

This study attempts to inquire the current dental conditions of the visually impaired, which should be managed by our eyes, and attempts to find the relationship between their perceptions on dental health and factors that affect overall health conditions.

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2. Research Subject and Method

112 questionnaires replied by the visually impaired had been analyzed using the SPSS Win ver. 19.0 program. The research utilized the frequency analysis for the dental care condition and its related characteristics, and the Duncan for the after review of differences among groups. The Pearson correlation analysis was used to figure out the relationship between the general characteristics and dental health condition, and the multiple regression analysis was utilized to find the factors affecting objective health condition.

3. Proposed Work

3.1 Dental Care Condition and Related Characteristics

Among the research subjects of the visually impaired, the

Item	Category	Frequency (N=112)	Percentage (%=100)		
Number of tooth brushing	1 time	15	13.4		
	2 times	48	42.9		
	Over 3 times	49	43.8		
Tooth brushing method	Side to side	24	21.4		
	Up and down with wrist rotation	21	18.8		
	In circles	6	5.4		
	Up and down while the top and bottom teeth touching each other	44	39.3		
	No specific method	17	15.2		
Usage of dental care products	Dental floss	14	12.5		
	Interdental brush	15	13.4		
	Mouthwash	10	8.9		
	Tongue cleaner	4	3.6		
	Etc.	3	2.7		
	No usage	66	58.9		
Toothbrush replacement term	Less than 1 month	5	4.5		
	1 month	5	4.5		
	2 months	17	15.2		
	3 months	11	9.8		
	Over 3 months	27	24.1		
	When toothbrush begins to wear	47	42.0		
Education received	Yes	11	9.8		
	No	101	90.2		
Experience of having teeth scaled	Yes	81	72.3		
	No	31	27.7		

Table 1.Dentalcare condition

number of tooth brushing was most frequent in 'over 3 times' with 43.8%, 'up and down while teeth touching each other' was most common in tooth brushing method with 39.3%, 58.9% responded as not using any dental care products, and 42.0% responded as replacing their toothbrush when it begins to wear. An overwhelming number of respondents of 90.2% replied as not received any education on dental care, and 72.3% replied as having experience of getting their teeth scaled shown in Table 1.

In health characteristics including dental care, high blood pressure was the highest among illness with 25.9%, 71.4% responded as not experiencing bleeding gum, 58.0% as having no perceived mouth-odor, 57.1% as having no dry mouth, 51.8% as having no bleeding while tooth brushing, 60.7% as having any sort of dental prosthesis and finally, 31.3% in dental health shown in Table 2.

Item	em Category		Percentage (%=100)		
Illness	None	27	24.1		
	High blood pressure	29	25.9		
	Diabetes	14	12.5		
	Stroke	3	2.7		
	Cancer	2	1.8		
	Bronchitis (Asthma, Rhinitis)	8	7.1		
	Apoplexy	5	4.5		
	Chronic liver failure	1	0.9		
	Coronary arteries /	4	3.6		
	Cardiac disorder				
	Joint / Musculoskeletal disorder	6	5.4		
	Gastrointestinal disorder	6	5.4		
	Etc.	7	6.3		
Occurrence of bleeding gums	None	80	71.4		
	Sometimes	7	6.3		
	Frequent	25	22.3		
Perceived mouth-odor	None	65	58.0		
	Sometimes	24	21.4		
	Frequent	23	20.5		
Dry mouth	None	64	57.1		
	Sometimes	9	8.0		
	Frequent	39	34.8		
Bleeding while tooth brushing	None	58	51.8		
	Sometimes	20	17.9		
	Frequent	34	30.4		
Dental prosthesis	Have	68	60.7		
	Do not have	44	39.3		
Dental health	In serious condition	8	7.1		
	In mildly negative condition	34	30.4		
	Average	35	31.3		
	In mildly positive condition	25	22.3		
	In perfect condition	10	8.9		

Table 2. Health characteristics

3.2 Average Comparison between Health Related Characteristics and Overall Health Condition

In average comparison between health related characteristics and overall health status, variables of general disease and place of dental treatment showed statistically meaningful differences whereas treatment period, number of tooth brushing, method of brushing, usage of dental care products and toothbrush replacement term showed no significant differences. Of general diseases, 'chronic liver ailment' was the highest with 4 points (p<0.01), 'dental clinic' the highest among place of dental treatment with 3.011 points, and statistically meaningful results were observed in the after review between variables of 'dental clinic' and 'general hospital' (p<0.05) Table 3.

Item	Category	Ν	Average	Standard deviation	t/F	р
	None		3.556	.934		
	High blood pressure	29	2.966	1.051		
	Diabetes	14	2.428	1.016		
	Stroke	3	2.333	.577		
111	Cancer	2	1.500	.707		
	Bronchitis (Asthma, Rhinitis)	8	2.875	.835	0.506	0.07
lliness	Apoplexy	5	2.000	.000	2.550	.007
	Chronic liver ailment	1	4.000			
	Coronary arteries /Cardiac disorder	4	2.500	1.290		
	Joint / Musculoskeletal disorder	6	2.500	1.38		
	Gastrointestinal disorder	6	3.000	.894		
	Etc.	7	3.000	.817		
	Tooth pain	85	2.952	1.057		
Transforment and a late	Sense of pus in mouth Dental prosthesis treatment Regular visits to the dentist		3.000	1.414	146	.932
Treatment period			2.823	1.185	.146	
			2.750	.707		
	1 time		3.133	1.302		
Number of tooth brushing	2 times	48	2.792	1.051	.744	.478
C	Over 3 times	49	2.980	.968		
	Side to side	24	2.833	1.167		
	Up and down with wrist rotation	21	2.857	.854		
Teath hunching mathed	In circles	6	2.167	.753	1 222	.306
looth brusning method	Up and down while the top and		2.114	1 002	1.222	
	bottom teeth touching each other	44	3.114	1.083		
	No specific method	17	2.882	1.054		
	Dental floss	14	2.857	.949		
	Interdental brush	15	2.867	1.302		
Usage of dental care	Mouthwash		3.500	.972	065	.443
products	Tongue cleaner		2.250	1.258	.965	
	Etc.	3	3.000	2.000		
	No usage	66	2.893	.963		
	Less than 1 month	5	2.800	1.095		
	1 month	5	3.400	1.140		
Toothbrush replacement	2 months	17	3.353	0.996	1.224	0.303
term	3 months	11	3.091	1.221		
	Over 3 months	27	2.852	1.099		
	When toothbrush begins to wear	47	2.723	0.971		
	Dental clinic b	89	3.011	1.039		
Place of treatment	Health center ab		2.700	1.031	3.021	.050
	General hospital a	3	1.667	.577		

Table 3. Average comparison between health related characteristics and overall health condition

3.3 Correlation with Overall Health Condition

Table 4 shows the analysis results for the correlation with overall health condition.

A relatively high positive correlation with bleeding gums were found in perceived mouth-odor with 0.511(p=0.01), in dry mouth with 0.261(p=0.01), and in

bleeding while tooth brushing with 0.659 (p=0.01), whereas dental health -0.302 (p=0.01) and satisfaction of dental treatment -0.204 (p=0.05) showed a low negative correlation.

Perceived mouth-odor had a low positive correlation with bleeding while tooth brushing 0.227 (p=0.05), a low negative correlation with dental prosthesis -0.307 (p=0.01) and dental health -0.410 (p=0.01), a low positive correlation

with experience of having teeth scaled 0.289 (p=0.01) and recent dental treatment, and finally a low negative correlation with satisfaction of dental treatment.

Dry mouth had a low positive correlation with bleeding while tooth brushing 0.290 (p=0.01) and a low negative correlation with dental health -0.196 (p=0.05).

Bleeding while tooth brushing had a low negative correlation with dental health -0.245(p=0.01), a low positive correlation with experience of receiving education 0.294 (p=0.01), and a low negative correlation with satisfaction of dental treatment -0.189 (p=0.05).

Usage of dental prosthesis had a low positive correlation of 0.340 (p=0.01) with usage of dentures, 0.355 (p=0.01) with dental health, a low negative correlation of -0.252 (p=0.01) with experience of having teeth scaled, and a low positive correlation of 0.198 (p=0.05) with satisfaction of dental treatment.

Usage of dentures had a low positive correlation of 0.351 (p=0.01) with dental health and a low negative correlation of -0.344 (p=0.01) with experience of having teeth scaled.

Dental health had a low positive correlation with experience of receiving education -0.208 (p=0.05), experience of having teeth scaled -0.344 (p=0.01), and satisfaction of dental treatment 0.233 (p=0.05).

Bleeding while tooth brushing had a low negative correlation with dental health -0.245 (p=0.01), a low positive correlation with education received 0.294 (p=0.01), and a low negative correlation with satisfaction of dental treatment -0.189 (p=0.05).

Receiving education had a low positive correlation with having teeth scaled 0.204(p=0.05), and with recent dental treatment 0.275 (p=0.01).

Recent dental treatment had a low negative correlation with satisfaction of dental treatment -0.221 (p=0.05).

4. Conclusion

Compared to the past, the development of medical technology, easy accessibility to abundant resources, changes in awareness to hygiene and the convenience of modern life have increased the average life expectancy of

Conclation with overall nearth condition	Fable 4.	Correlation	with	overall health	condition
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	1	2	3	4	5	6	7	8	9	10	11
1	1										
2	.511 **	1									
3	.261 **	0.055	1								
4	.659 **	.227 *	.290 **	1							
5	-0.162	307 **	-0.18	-0.053	1						
6	-0.01	-0.167	-0.048	-0.046	.340 **	1					
7	302 **	410 **	196 *	245 **	.355 **	.351 **	1				
8	0.165	0.145	0.146	.294 **	-0.103	-0.14	208 *	1			
9	0.077	.289 **	-0.023	0.015	252 **	517 **	344 **	.204 *	1		
10	0.151	.220 *	0.071	0.128	-0.091	-0.031	-0.081	.275 **	0.149	1	
11	204 *	226 *	-0.077	189 *	.198 *	0.051	.233 *	247 **	-0.148	221*	1

1: Bleeding gums, 2: Perceived mouth-odor, 3: Dry mouth, 4: Bleeding while tooth brushing, 5: Dental prosthesis, 6: Dentures, 7: Dental health, 8: Education received, 9: Experience of having teeth scaled, 10: Recent dental treatment, 11: Satisfaction of dental treatment

people, and increased interests in living a healthy life. On top of that, people began to pay attention in dental health, which is responsible for basic nutrition consumption of daily life. The mouth which has frequent contact with food and air, must be managed in a sanitary way, and as this applies to everyone, the visually impaired are also not an exception.

In the dental care condition of the visually impaired, 42% replied to using their toothbrushes until it wears down, and a high percentage of 90.2% replied as not having received any sort of education regarding dental health. As shown in In⁴ study results, overall dental health related education is a necessity for each individual's knowledge, motivation, attitude and actions regarding dental care. As education affects the human's consciousness and actions, lot of improvements in the field of education is required.

The highest point in the average comparison between general characteristics and overall health condition was 3.273 in family structure of 'living with sons and daughters, and the after review results showed statistically significant results among 'living alone', 'living with sons and daughters', and 'other' (p<0.05). This states that in family structure of living (alone vs with sons and daughters), living with sons and daughters has a positive effect on overall health condition compared to living alone, which is in line with the study results of⁵, indicating that a family is effective in raising the quality of life. In particular, it can be concluded that the visually impaired is heavily dependent upon their environment as living with others affects their recognition of obstacles and of nearby action.

In average comparison of oral health status, health related characteristics and overall health status, variables of general disease and dental care location showed statistically meaningful difference. Of general diseases, 'chronic liver ailment' was the highest with 4 points (p<0.01). Of course such results cannot be concluded as a relationship between the mouth and overall health, but periodontal disease, which can be frequently found in the mouth, shows the characteristics of infection, bacteremia, and others, caused by the long-term exposure of bacteria toxin⁶. This, along with study⁷ which speculates that other factors causing coronary artery disease and myocardial infarction provoke an immune reaction contributing to the coronary arteries, shows that dental diseases are related to overall health problems and emphasizes the importance of dental hygiene⁸⁻¹¹.

It is impetuous to claim that dental problems in subjects are related to the induction of overall illness, but it is also hard to say that the two are completely unrelated. As studies dealing the relationship between dental problems and overall health illness begin to be introduced, it is thought that more research needs to be conducted on the topic.

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