Factors that cause influence on the knowledge of oral health of university students.

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Abstract

Oral health can be defined that "Individuals have satisfactory functional teeth that can eat, talk and do social activities without pain, disorder and discomfort during whole life and this contributes to general individual's life welfare. As health problems have become an essential element of life, the importance of oral health care has been increasingly emphasized throughout life, from childhood to old age. To evaluate this purpose, we used this oral health status scale, which was recently developed. We examined the distribution of gender, income, oral health education, the time of tooth brushing, the frequency of tooth brushing, the experience of dental treatment, the period of using tooth brushing, grade and so on to understand the general characteristics of the subjects who are university students. Form this study we can see that we should consider individual dental treatment experience, gender, frequency of tooth brushing and oral health education to improve university students' oral health knowledge. Therefore, university student's oral health knowledge is important and oral health education for university students should be provided to contribute to positive change of cognition about oral health care of the subjects. The limit of this study is representing population is difficult because we target only students of some university and there is individual error about answer the survey so we expect a more detailed, developed follow-up study.

Introduction

Oral health can be defined that "Individuals have satisfactory functional teeth that can eat, talk and do social activities without pain, disorder and discomfort during whole life and this contributes to general individual's life welfare [1]. As health problems have become an essential element of life, the importance of oral health care has been increasingly emphasized throughout life, from childhood to old age [2]. However, that does not mean income actions for oral health leads to putting actions for health into practice immediately. Starting from realization of health, practice for health can come in to action through awareness and understanding, demand of knowledge and analysis step [3]. Therefore, we can say that the realization of oral health is the most important factor. In addition, oral health education is an important part of the oral care process, and moreover oral health education is necessary because the oral health professionals can participate and exchange opinions with patients [4]. There are currently oral

health educations in kindergarteners and the lower grades in elementary school, even if these were insufficient [5]. In addition, almost oral health educations for university students were not implemented. The oral health form while in the college integrates with experience not only in childhood but also in adolescence. The oral health form while in further college causes big influence on the oral health form in the future [6]. Moreover university students will go into the world in the close future and play a role to start a family. For these reasons, the knowledge, attitude and action for oral health of university students affect greatly to social marginal individuals and family [7]. But, university students don't determine their own oral health status [8]. There is also partly overlap between university students and both of adolescence and adulthood and they have unique characteristics as target of education. So, it is needed to understand target's social and psychological characteristics for effective oral health education [9]. Especially, prevention before contraction of disease is the most important because oral diseases occur frequently and have the

characteristics of chronic disease, progressive disease and diffuse disease. To do this, we should motivate them to change their attitude for the improvement oral health by themselves [10]. The university students have to not only have the knowledge of oral health basically but also put it into action in order to prevent and maintain for oral health.

Therefore, this purpose of this study is to arrange frame of fundamental documents about the knowledge of general oral health targeting university students that is early adulthood. This study is supposed to suggest the exact plan and importance for qualitative improvement of oral health education business and furthermore, contribute oral health of university students to maintain clearly during whole life through examining factors and behaviors that causes influence on the knowledge of oral health of university students and understanding interrelation between them.

Materials and Methods

Materials and procedure

To evaluate this purpose, we used this oral health status scale, which was recently developed. This scale includes 15 questions and consists of dichotomous scale. We gave 1 point to right answer and 0 point to wrong answer and it means the more points the subjects are given, the more knowledge about oral health they have.

We examined the distribution of gender, income, oral health education, the time of tooth brushing, the frequency of tooth brushing, the experience of dental treatment, the period of using tooth brushing, grade and so on to understand the general characteristics of the subjects who are university students.

We performed recruited the university student in G and B province and made up a question voluntary for one week. We discussed the questionnaire items with co-workers (experts in these fields) in advances and we visited several university department and dental institution directly. Almost all questionnaires were collected except some wrong-answered questionnaires.

Analysis

We analysed university students' knowledge about oral health using frequency analysis and descriptive statistics. We also used multiple regression (F=6.780, P<0.001) to analyse factors that cause influence on the knowledge about oral health. Adjustment Coefficient was adjR^2=0.264. From this analysis, Dentistry treatment experience was important factors to the knowledge about oral health of university students. However toothbrush time was not important factor to the knowledge about oral health of university students.

We used SPPS 18.0 program to analyse.

Classification	Variable	Explanation
Dependent variable	Knowledge of oral health	15 questions Binary scale, 0 wrong answer, 1 right answer
Independent variable	Gender	0 Female, 1 Male
	Income	1. 190-thousand won or less, 2. 200-290-thousand won, 3. 30-390-thousand won, 4. 400-490-thousand won, 5. 500-thousand won or more
	Health status	1. Very bad, 2. Bad, 3. Normal, 4. Good, 5. Very good
	General health concerned	1. Very not concerned, 2. Not concerned, 3. Normal, 4. Concerned, 5. Very concerned
	Oral health education	0. Inexperience, 10 Experience
	Frequency of tooth brushing	1. 1 time or less, 2. 1-2 times, 3. 3-4 times, 4. 5-6 times, 5. 7 times or more
	Time of tooth brushing	1. 1-2 min, 2. 2-3 min, 3. 3-4 min, 4. 5 min or more
	Period of using tooth brushing	1. 1-3 mon, 2. 4-6 mon, 3. 7-9 mon, 4. 10 mon or more
	Dental treatment experience	0. Inexperience, 1. Experience
	Oral health status	1. Very bad, 2. Bad, 3. Normal, 4. Good, 5. Very good
	Oral health concerned	1. Very not concerned, 2. Not concerned, 3. Normal, 4. Concerned, 5. Very concerned

Results

General characteristics and oral health behavior of the subjects who are university students

We examined the distribution of gender, income, oral health education, the time of tooth brushing, the frequency of tooth brushing, the experience of dental treatment, the period of

using tooth brushing, grade and so on to understand the general characteristics of the subjects who are university students.

Male is 57.7%, 3000 thousand won to 390 thousand won is the most in median income (32.9%), the experience rate is 41.9% and 2~3 min is the most in the time of tooth brushing (55.9%) (Table 1). In the next, 3~4 times per d is 60.4% in the frequency of tooth brushing, 1~3 mon is the most in the period

of using tooth brushing (61.7%) and 92% have dental treatment experience.

Table 1. *General characteristics and oral health behavior of the subjects who are university students.*

Classification	Item	Frequency	Percent	Classification	Item	Frequency	Percent
Gender	Female	94	42.3	Grade	1st grade student in university	69	31.1
	Male	128	57.7		2nd grade student in university	116	52.3
	Total	222	100		3rd grade student in university	22	9.9
Income	190 thousand won or less	32	14.4		4th grade student in university	10	4.5
	200~290 thousand won	59	26.6		Other grade	5	2.3
	300~390 thousand won	73	32.9		Total	222	100
	400~490 thousand won	39	17.6	Dental treatment experience	No	16	7.3
	500 thousand won or more	19	8.6		Yes	204	92.7
	Total	222	100		Total	220	100
Oral health education	No	129	58.1	Frequency of tooth brushing	1~2 times	88	39.6
	Yes	93	41.9		3~4 times	134	60.4
	Total	222	100		Total	222	100
Time of tooth brushing	1~2 min	10	4.5	Period of using tooth brushing	1~3 mon	137	61.7
	2~3 min	124	55.9		4~6 mon	79	35.6
	3~4 min	72	32.4		7~9 mon	2	0.9
	5 min or more	16	7.2		10 months or more	4	1.8
	Total	222	100		Total	222	100

Level of the knowledge about oral health and prime variable

We analysed level of the knowledge about oral health and prime variable using descriptive statistic. The average of the knowledge about oral health is 10.3 points out of 15 points. In the next, the average of income is high 200,000 won, health status is bad, general health concerned is not concerned and oral health status and oral health concerned is the average (Table 2).

Table 2. *Level of the knowledge about oral health and prime variable.*

	N	Average	Standard deviation	Minimum value	Maximum value
Knowledge of oral health	222	10.266	2.088	3.00	14.00
Income	222	2.793	1.150	1.00	5.00
Health status	222	2.135	.965	1.00	5.00
General health concerned	222	2.365	1.019	1.00	5.00
Oral health status	222	3.239	.923	1.00	5.00
Oral health concerned	222	3.387	.781	1.00	5.00

Itemized level of the knowledge of oral health of university students

The average of the right answer rate is 10.27 points (100 points convert into 68.44 points) to examine level of the knowledge about oral health of university students whose major is not dental hygiene. The question with high right answer rate is 'dental caries is usually heals by itself.' (Right answer 86.9%) followed by 'dental caries gives pain when it starts first.' (Right answer 85.1%), 'dental caries bacteria moves tooth to tooth.' (Right answer 84.2%). On the other hand, the question with high wrong answer rate is 'Blooding from gingiva when tooth brushing is the sign of gingival disease.' (Right answer 37.4%) followed by 'fluorine plays the role of water disinfection.' (Right answer 39.2%) and 'gingival disease gives pain when it starts first.' (Right answer 54.5%) (Table 3).

Factors that causes influence on the knowledge of oral health of university students

We analysed factors that causes influence on the knowledge of oral health of university students using multicenter retrospective study. We put level of the knowledge about oral health into dependent variable and both of general characteristics and factor of practice for oral health into independent variable.

We also used multiple regression to analyse factors that cause influence on the knowledge about oral health. It was statistically significant differences (F=6.780, P<0.001) (Table 4). Adjustment Coefficient was adjR^2=0.264. From this analysis, of the several factors, dentistry treatment experience and toothbrush time was meaningful factors to the knowledge about oral health of university students.

Dentistry treatment experience was important factors to the knowledge about oral health of university students. However toothbrush time was not important factor to the knowledge about oral health of university students.

We used SPPS 18.0 program to analyse.

The analysis result show higher level of the knowledge about oral health in female than male, lower income, lower frequency of tooth brushing and having dental treatment experience than not having. Furthermore, experience of oral health education causes influence on the knowledge of oral health, but it isn't significant in 0.05 statistical significance level.

Table 3. *Level of the knowledge of oral health of university students.*

	Questions	O/X	Right answer rate	Rank
1	Dental caries bacteria move tooth to tooth.		84.2%	3
2	Dental plaque causes dental caries		83.8%	4
3	Dental caries is usually heal by itself..	X	86.9%	1
4	Dental caries gives pain when it starts first.	X	85.1%	2
5	We don't need to treat dental caries of deciduous tooth.	X	73.0%	8
6	Dental plaque and tartar cause gingival disease		82.7%	5
7	When gingival disease gets worse, bone in tooth will be destroyed.		82.0%	6
8	Blooding from gingiva when tooth brushing is the sign of gingival disease.	X	37.4%	15
9	Gingival disease gives pain when it starts first.	X	54.5%	13
10	Scaling has many side effects such as sculpting tooth, tooth mobility and etc.	X	56.8%	12
11	Fluorine prevents dental caries.		78.8%	7
12	Fluorine shows where dental plaque is.	X	59.9%	10
13	Fluorine makes tooth white.	X	59.0%	11
14	Fluorine helps recovery of early dental caries.		64.0%	9
15	Fluorine plays the role of water disinfection.	X	39.2%	14

Table 4. *Factors that causes influence on the knowledge of oral health of university students (Interrelation-multicenter retrospective study).*

	B	Standard error	Beta	t	Tolerance	VIF
3. Gender	-0.966	0.275	-0.23	-3.515***	0.829	1.207
2. Income	-0.465	0.119	-0.257	-3.912***	0.821	1.218
Health status	-0.071	0.167	-0.033	-0.424	0.594	1.683
General health concerned	0.006	0.156	0.003	0.036	0.605	1.652
Oral health education	0.494	0.273	0.117	1.807†	0.84	1.19
4. Frequency of tooth brushing	-0.584	0.275	-0.137	-2.125*	0.851	1.174
Time of tooth brushing	0.17	0.189	0.057	0.897	0.891	1.123

Period of using tooth brushing	-0.055	0.218	-0.016	-0.251	0.869	1.15
1. Dental treatment experience	2.802	0.533	0.35	5.253***	0.799	1.251
Oral health status	0.179	0.161	0.079	1.115	0.699	1.43
Oral health concerned	-0.187	0.185	-0.07	-1.011	0.734	1.363
(Invariable)				10.717***		
R^2				0.264		
adj.R^2				0.225		
F				6.78***		

†$p<0.1$, *$p<0.05$, ***$p<0.001$.

Discussion and Conclusion

Despite the growing needs, Oral health care services were relatively small especially in G and B provinces. It was generally understood that Korean people will seek the health care service only when they recognize a need for dental treatment. That's because, it is most important things that evaluating and educating oral health status and analyzing factors on the knowledge of oral health in the periods of university periods.

Moreover, there is some reports of educational intervention on oral hygiene is closely related with the good quality of life.

University students belong to the youth oral health target and will play a leading part in the future, so it is helpful a lot to seek for development direction of oral health care in future society that examine their oral health concerned [11]. The level of oral health can be improved through changing the knowledge, attitude and action involved in oral health rationally and the information about these seems to play an important role in long-term comprehensive oral health development [12]. In the past, the major purpose of oral health care was treatment but as changing of cognition, various methods to prevent dental caries and periodontal disease have been found. Especially, the cognition of oral health education has been increased [13]. In the result of examining advanced study, the level of cognition is regarded as similar meaning to the knowledge. The level of knowledge is associated significantly with the level of periodontal treatment demand [14]. Furthermore, the individual level of knowledge about oral health causes influence to management. Individuals recognize and judge their own oral health status based this so its importance has been emphasized [15]. Therefore, it is also important that university students have the right knowledge about oral health. This study researched the university students' knowledge of oral health, the level of that and the factors that cause influence in the knowledge about oral health in order to provide a framework of base line data for the university students' knowledge about oral health.

In general characteristic, the experience rate of university students' oral health education is 41.9%. It is somewhat higher than advanced study's rate; 28.1% but still seems to be low

[16]. Besides, Kim's study reported the level of knowledge of group that had oral health education is higher than group that didn't have in the result of estimating after oral health education targeting elementary school students [17]. Kim's study said 53.0% of health related majors and 52.4% of non-health related majors recognized that oral health education is necessary through answering the question about the need of oral health education [18]. So, we consider it is important to increase the chance of university students' oral health education. Darby and Walsh [19] suggested tooth brushing twice at least in a day in order to prevent formation of dental plaque and control bad breathe although there is not fixed number of tooth brushing that can prevent formation of dental plaque. However, the highest frequency of tooth brushing in this study was 3~4 times per d as 60.4%. The subjects who brush their teeth 3 times per d among 178 elementary students are the highest as 59.0% [20]. In addition, in Joe's [20] study targeting some professions affiliated to medical care institution for the elderly, 89.1% of the subjects also answered they brush their teeth more than 3 times per d. It is same as advanced study. But, the highest period of using toothbrush was 1~3 mon as 61.7%. In the case of average replacement cycle for toothbrush, 48.9% of men answered 3~4 mon and 38.6% of women answered 2~3 months [21]. It is different result with this study.

The average knowledge about oral health is 10.3 point out of 15 point. It is similar to Lee et al.'s study that the average knowledge about oral health is 8.77 point out of 14 point [22]. Health status is bad and the general health concerned level was also low. Besides, oral health status and oral health concerned level is lower than the knowledge about oral health as 3.24 point and 3.39 point. Currently, the level of knowledge about oral health increases more than before. As shown in Kim and Min's study [23], the public's cognition about importance of oral health also increases by economic growth, advertisement through media, increase in dental institution and extending medical insurance. The high knowledge about oral health is very important because it changes attitude for oral health, promote right oral health action and make the public have a habit of it.

In the result of itemized level of the knowledge of oral health of university students (Table 3), the average right answer rate

for 15 questions to see non-dental hygiene majors' oral health knowledge level is 10.27 point (100 points convert into 68.44 points). The question with high right answer rate is 'Dental caries is usually healed by itself.' (Right answer 86.9%) followed by 'Dental caries gives pain when it starts first.' (Right answer 85.1%). This is same to the study targeting pregnant women in some regions that each same questions' right answer rate was high as 95.6% and 85.4% [24]. On the other hand, the question with high wrong answer rate is 'Fluorine plays the role of water disinfection.' (Right answer 39.2%) although there is the question with high right answer rate; 'Fluorine prevents dental caries.' (Right answer 78.8%). This means there is shortage of the knowledge about fluorine's various roles. It is same as Kim and Song's study [25] that reported most of subjects have wrong cognition about fluorine generally. We consider it is important to use fluorine with exact knowledge.

The analysis result show the higher level of the knowledge about oral health in female than male, lower income, lower frequency of tooth brushing and having dental treatment experience than not having. Furthermore, experience of oral health education causes influence on the knowledge of oral health, but it isn't significant in 0.05 statistical significance level. This is same as Kim and Woo's study [26] that reported oral health knowledge level of laborers who have education experience is higher than one of laborers who don't have. Son [27] let us know the importance of oral health education by saying the knowledge and attitude about oral health change through oral health education. Park and Moon [28] also showed female have higher oral health knowledge level than male. However, the knowledge about oral health by household income didn't represent significant difference statistically. This is different with this study's result that the lower income causes influence in the knowledge about oral health. Although Jang and Kim's study [29] reported the subjects have lower average income per month then have worse oral health status and this is because they have psychological burdens about dental treatment fee so they can't have been treated on time, this study shows the subjects who have lower income have the higher knowledge about oral health and this seems that psychological burdens about dental treatment fee causes influence in the knowledge about oral health. Lim and Choi's study [30] reported the higher score of oral health knowledge the subjects have, the higher score of oral health action they have. This study represents lower frequency of tooth brushing causes influence in the oral health knowledge although advanced study there is a result of study that there was no significant difference in dental treatment experience, frequency of tooth brushing, time of brushing by subjective oral health knowledge of parents and children [31]. However, this study showed that the lesser frequency of tooth brushing the more affected by oral health knowledge. We think these results show influence in frequency of tooth brushing and oral health knowledge can be changed by who is the subjects.

In the above results or this study, we can see that we should consider individual dental treatment experience, gender, frequency of tooth brushing and oral health education to improve university students' oral health knowledge. Therefore, university student's oral health knowledge is important and oral health education for university students should be provided to contribute to positive change of cognition about oral health care of the subjects. The limit of this study is representing population is difficult because we target only students of some university and there is individual error about answer the survey so we expect a more detailed, developed follow-up study.

Near future researches, developing and educating oral health program consisted of oral health knowledge factors in university students is urgently needed. This study should be help in providing more information about the impact of oral health programs.

Acknowledgement

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