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Convergence correlation of oral health behavior and planned behavior theory variables before and after oral health education

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구강건강교육 전후에 구강건강행동과 계획된 행동이론 변수들과의 융합적 상관관계 연구

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Abstract This study was performed to determine correlation on oral health behavior and variables of planned behavior theory before and after oral health education. 62 male inpatient alcoholics conducted the structured self-administered questionnaires, and subjects were taken oral health education for 4 weeks. To analysis data, the correlation analysis was conducted. The education group showed a significant positive correlation with oral health behavior and behavior intention, attitude toward behavior, subjective norm, perceive behavior control after oral health education. The relevant variables after the oral health education displayed a higher correlation coefficient and relation in the education group. It suggested an evidence that regular oral health education should be applied to promote oral health for alcoholic inpatients.

Key Words : Inpatient alcoholics, Oral health behavior, Oral Health Education, Theory of Planned Behavior(TPB), Convergence Correlation

요 약 이 연구는 구강건강교육 전후 구강건강행동과 계획된 행동이론변수들 및 구강건강행동의 영향요인들과의 관계를 알아보기 위해 시도되었다. 알코올전문병원에 입원한 62명의 남성환자들을 대상으로 하여 구조화된 설문지와 구강검사를 통하여 자료를 얻었고, 상관관계분석을 이용하여 해석하였다. 교육전 상관관계지수와 비교하였을 때, 구강건강 교육후 구강건강교육그룹은 구강건강행동과 행동의도, 행위태도, 주관적 규범, 인지된 행동조절이 유의미하게 긍정적인 관계를 보였다. 교육후 변수들은 통계적으로 더욱더 높은 상관관계지수를 보였다. 그것은 구강건강교육에 의하여 상관관계가 더욱 강화되었음을 의미한다. 이는 입원한 알코올중독환자들의 구강건강을 향상시키기 위해서 구강건강교육을 체계적으로 해야 하는 근거를 제시한 것이다.

주제어 : 알코올중독, 구강건강행동, 계획된 행동이론변수, 구강건강교육, 융합적 상관관계

1. Introduction

Lately health has been considered as main element for human life and understood as a comprehensive concept, so that dental health which plays an important role in improving life quality has been regarded as important as part of health factors together with physical health maintenance through normal food

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intake[1]. Dental caries and periodontal disease, which are most commonly occurring chronic diseases, are not naturally cured and are major dental health breakers[2]. Among reasons of adult outpatient service are dental caries, ranking in the third, and other diseases including tooth and its support structure disorders coming in the 7th, which are taking the higher positions in the 10 major rankings[3].

In Korea, the National Health Promotion Act and the Dental Health Act regulated the implementation of education business of dental health to prevent national oral diseases and improve dental health[4]. However, the domestic ongoing dental health education has been partially carried out on schools, industry fields, disabled persons, and life cycle stages in priority, but the dental health education is restrictively implemented on hospitalized alcoholics patients or alcoholics outpatients visiting the alcohol treatment center[5]. But the education program for hospitalized alcoholics patients has the merit that provides intensive programs during treatment period and can improve oral rehabilitation through the program [6-8]. Relatively people who have poor dental health environment don't get the chance of regular dental education program. So we selected alcoholic patients as our study subjects. Therefore the dental health education program should be applied variously in association with the treatment program that is provided to alcoholic patients, considering living style, diet style and dental health management behavior.

Therefore this study has purpose to verify the dental health-related characteristics of inpatient alcoholics, investigate influencing factors on oral health behavior, and resultingly provide essential data to develop oral health promotion .

2. Methods

2.1 Subjects

In regard to the size of sample, the number of samples was 27 when it was calculated by effects (0.5), power (0.8) and significance level (0.05), using the G Power 3.14 analysis software. For expecting dropout persons, 70 subjects joined this study in the first time. At the end of study, the subjects were 62 male alcoholic patients in the two alcohol treatment clinics that allowed the study D area. They understood purpose of the study. And the subjects voluntarily agreed to participation in this study. The survey and test results were collected from 62 patients, who were divided into education group (32) and non-education group (30).

2.2 Method

2.2.1 Research Methods

The study protocol was examined and approved by Bioethics Committee of Graduate School of Medicine of Chungnam National University (No. 12-05). The survey was conducted by answering self-administered questionnaires in the structured questionnaires, after the purpose of this study was explained to subjects, informing them of anonymity and confidentiality, and receiving the informed consent from the subjects who agreed the study, and the survey was conducted 2 times before and after the oral health education respectively. The education group went through the dental health education and toothbrushing education four times at one-week interval at the appointed date.

2.2.2 Theory of Planned Behavior(TPB) variable measurement tools

This tool was composed of 5 articles, and was measured in the 5-point rating scale[9-11]. ①Attitude toward the behavior: It is made up of 6 questionnaires, which are classified to 'good-bad,' 'helpful - harmful,' 'unpleasant - pleasant,' 'important - unimportant,' 'necessary - unnecessary.' 'stupid - smart' ② Subjective norm: It consists of 4 questionnaires, classifying into the statements in which people 'think that I must brush my teeth,' 'expect that I will brush my tooth well,' 'think that I should have responsibility

for my toothbrushing,' 'hope that I will brush my teeth well.' ③ Perceived behavioral control: It is made up of 4 questionnaires, stating that 'I can do it always,' 'It is an easy-difficult thing,' 'It depends on me whether to do or not to do,' 'It is me who decides on it.' regarding toothbrushing. ④ Behavioral intention: It composed of 4 questionnaires, stating, 'I am planning,' ' 'I will try to,' 'I decided to,' 'I will do well on,' regarding toothbrushing. ⑤ Oral health behavior: It is the self-report result that the subject briefed of the number of toothbrushing periodically everyday for one week[12].

2.2.3 Oral Health Education Program

The oral health education program was produced to change interest, knowledge, attitude and behavior in oral health, so that oral health could be reasonably managed. The program for oral health education in the study was modified and complemented through the advice of two dental hygienic professors who had majored in education which was based on the oral health education contents that had been developed for adults, senior citizens and the general public by the Korean Dental Health Association, which was supported by National Health Promotion Fund Project of the Ministry of Health and Welfare, and on the feasibility-acknowledged contents in the study of actual condition and model development of the oral health education project[13].

2.2.4 Patient hygiene performance index, PHP

The dental plaque colorant was applied on the teeth, and after 30 seconds, the score was given according to the adhesion of the dental plaque colored on each part.

2.2.5 Oral health knowledge

The knowledge of the oral health education contents was presented in 10 questionnaires on a maximum of 10 points, by self-administered questionnaire systems.

2.3 Statistics

Mean(M) and standard deviation (SD) of every variable before and after oral health education program were estimated, and the correlations among variables were examined with correlation analysis. Statistical significance level is $p<0.05$.

3. Results

3.1 Correlation coefficients among variables before oral health education

The education group showed a significant positive correlation with behavior intention and attitude toward behavior, and the non-education group showed a significant positive correlation with oral health behavior and behavior intention before the oral health education. The education group showed a significant positive correlation with attitude toward behavior, perceived behavior control and subjective norm, and the non-education group showed a significant positive correlation with behavior intention, perceived behavior control and oral health knowledge before the education. The education group presented a significant positive correlation with subjective norm and perceived behavior control, and the non-education presented a significant positive correlation with attitude toward behavior and subjective norm before the education. The education group showed a significant positive correlation with subjective norm and perceived behavior control before the education. The education group showed stronger correlation with variables than the non-education group before the oral health education in Table 1.

3.2 Correlation coefficients among variables after oral health education

The education group showed a significant positive correlation with behavior intention, attitude toward behavior, subjective norm and perceive behavior control, and the non-education group showed no

correlation with oral health behavior and variables after the oral health education. After the education, the education group showed a significant positive correlation with attitude toward behavior, subjective norm and perceived behavior control, but showed a significant negative correlation with dental health knowledge, and the behavior intention in the non-education group showed a significant positive correlation with perceived behavior control. After the education, education group showed a significant positive correlation with subjective norm significant positive correlation with subjective norm. After the education, subjective norm in the education group showed a significant positive correlation with perceive behavior control. After the education, and perceived behavior control, and attitude toward behavior in the non-education group showed a the modified patient hygiene performance in the non-education group showed a significant negative correlation with oral health-relation knowledge. The relevant variables 'after the oral health education' displayed a higher correlation coefficient and relation in the education group than the non-education group compared to 'before the oral health education,' and presented stronger significance statistically in Table 2.

4. Discussions

This study aimed to measure oral health behavior, modified patient hygiene performance index (PHP), oral health knowledge, and variables of the theory of

Table 1. Correlation coefficients among variables before oral health education

	Variables	Oral health behavior	Behavioral intention	Attitude toward behavior	Subjective norm	Perceived behavioral control	PHP
Education group	Behavioral intention	0.659**					
	Attitude toward behavior	0.357*	0.487**				
	Subjective norm	0.332	0.557**	0.767**			
	Perceived behavioral control	0.204	0.547**	0.370*	0.398*		
	PHP	-0.119	0.023	-0.146	0.006	0.061	
	Oral health knowledge	-0.013	0.062	0.021	0.212	0.307	0.279
Non-education group	Behavioral intention	0.617**					
	Attitude toward behavior	0.315	0.279				
	Subjective norm	0.271	0.301	0.379*			
	Perceived behavioral control	0.161	0.546**	0.092	0.151		
	PHP	-0.195	-0.228	-0.208	-0.131	0.125	
	Oral health knowledge	0.225	0.420*	0.200	0.220	0.123	-0.306

*: p<0.05, **: p<0.01

Table 2. Correlation coefficients among variables after oral health education

	Variables	Oral health behavior	Behavioral intention	Attitude toward behavior	Subjective norm	Perceived behavioral control	PHP
Education group	Behavioral intention	0.955**					
	Attitude toward behavior	0.735**	0.770**				
	Subjective norm	0.694**	0.637**	0.698**			
	Perceived behavioral control	0.950**	0.951**	0.795**	0.736**		
	PHP	-0.267	-0.309	-0.212	-0.280	-0.298	
	Oral health knowledge	-0.330	-0.352*	-0.302	-0.176	-0.344	-0.082
Non-education group	Behavioral intention	-0.063					
	Attitude toward behavior	0.105	0.014				
	Subjective norm	-0.023	0.263	0.372*			
	Perceived behavioral control	0.333	0.443*	0.054	0.269		
	PHP	-0.012	0.081	-0.222	0.194	0.055	
	Oral health knowledge	0.095	0.152	0.324	0.087	0.076	-0.387*

*: p<0.05, **: p<0.01

planned behavioral on hospitalized alcoholics patients, understand influence on the oral health behavior before and after oral health education, and investigate the correlations of variables before and after the education.

Checking for the effect of planned behavior theory variables, comparisons between the groups did not make much difference before the education, but higher scores in the oral health education group than the non-education group were shown after the education. These increases showed that oral health education had certainly positive effect on the ability and fulfillment of oral health behavior by changing all TPB variables measured[14,15,16]. In this study, the reduction of 1.57 points was done by 4 times of the repeated education and conducting private lessons for toothbrushing. A few reductions were reported by researchers. Jeon made a reduction of 1.31 points by 4 times of the repeated education[17], Ryu, 1.7 points by 2 times of the repeated education[16], Lee, 0.88 points by 2 times of the repeated education[10], and Jo, 0.3 points by one-time education[18]. In another study by Kim, who used the dental plague examination, after four times of the education for toothbrushing, dental plaque removal improved as the number of educations for toothbrushing increased[15]. It was considered that as repeated educations increased, modified patient hygiene performance management improved[19,20]. Also, education group showed a significant positive correlation with behavior intention, attitude toward behavior, subjective norm and perceive behavior control, and the non-education group showed no correlation with oral health behavior and variables after the oral health education. The relevant variables 'after the oral health education' displayed a higher correlation coefficient and relation in the oral health education group than the non-education group compared to 'before the oral health education,' and presented stronger significance statistically[9,12,14]. The Oral health education for inpatient alcoholics had affirmative effects on oral health behavior. So, there is a need to systematically apply the oral health education programs for improving oral health.

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