

The Relations among Oral Health Literacy and Oral Health-Related Quality of Life of Elderly Living in a Community

¹Young-Sook Kwon and ²Kyung-Shin Paek

¹Department of Nursing, Joongbu University, Geumsan-Gun, 32713 Chungnam, Korea

²Department of Nursing, Semyung University, Jecheon-City, 27136 Chungbuk, Korea

Abstract: This study is to examine the oral health literacy and oral health-related quality of life in community elderly and to identify their relationship. Participants in this cross-sectional survey were 285 aged over 65 elderly. Data were collected from Aug. 4-29, 2015 using the self-report questionnaire. ANOVA and t-test were conducted to examine the oral health literacy by the characteristics of the participants. The relationship between oral health literacy and oral health-related quality of life was estimated by the Pearson correlation coefficients. The mean score of oral health literacy was 34.19(±14.54). The 57.9% of participants were at a 4-6th grade level of oral health literacy and 23.5% were at a 7-8th grade level of oral health literacy. The mean score of oral health-related quality of life was 14.27(±12.04). Oral health literacy was correlated negatively with oral health-related quality of life ($r = -0.347, p < 0.001$). All of the correlations between oral health literacy and seven domains of oral health-related quality of life were significant. These findings show the importance of establishing intervention programs to strengthen the oral health literacy of elderly to help them increase the oral health-related quality of life.

Key words: Oral health literacy, oral health-related quality of life, oral health status, community dwelling, elderly, Korea

INTRODUCTION

Follow an increase in elderly people, they are concerned about physical and mental health problems but seem to be little interested in oral health problems (Lee *et al.*, 2014). Korea national health and nutrition examination survey of 2014 announced the prevalence of periodontal disease was 49.8% of 60-69 years and 41.6% of aged over 70. The rate of restricted oral function such as chewing discomfort by oral problems, the difficulty of pronunciation was 42.5% of 60-69 years and 51.5% of aged over 70 (MHW, 2016). Many older adults had enough experience poor oral health.

Many aspects of general health are influenced by oral disease and it can have an effect on oral health (Susan *et al.*, 2012). Extensive tooth loss impairs chewing efficiency (Sarita *et al.*, 2003) and can limit food choices (Ervin and Dye, 2009) and lead to the imbalance of nutrients. Also, it has difficulty of speech which limits social life (Smith and Sheiham, 1979) and lower self-esteem (Starr and Hall, 2010). The elderly with poor oral health degrade their satisfaction with life and quality of life (Susan *et al.*, 2012; Jang *et al.*, 2015). Prevention of respiratory infection in elderly keeps a good oral health (Pace and McCullough, 2010). It is defined dental health literacy as “the degree to which individuals have the capacity to obtain, process and understand basic oral

health information and services needed to make appropriate health decisions”. As age increased, general and oral health often get worse simultaneously (John *et al.*, 2004; Kwon and Choi 2016). Elderly person with low health literacy have a difficulty controlling their dental health (Horowitz and Kleinman, 2008) and accessing the oral health care (Susan *et al.*, 2012) and some oral health disparities.

Oral health literacy is bound up with dental health status and oral health-related quality of life (Lee *et al.*, 2007). Low oral health literacy gives the elderly a hard time to get the information about oral health and lead a poor oral health (Davis *et al.*, 1998).

Despite importance of oral health, it pay less attention to oral health literacy in nursing until now (Lee *et al.*, 2014; Alexander, 2000). Thus, this study is to examine the oral health literacy and oral health-related quality of life of the elderly living in a community and to identify their relationship.

MATERIALS AND METHODS

The aged over 65 elderly in a community were used as a sample by a convenience sampling technique. Data were collected between Aug. 4 and 29, 2015. Questionnaires were distributed to 300 the elderly, of which 285 questionnaires were returned.

Oral health literacy was measured using the instrument by Richmond *et al.* (2007) modified by Ju *et al.* (2012). It consists of 66 words with a dichotomized scale (understanding = 1, not understanding = 0). The number of words the participant knows rightly is scored and the total score ranges from 0- 66. The higher the total score, the better the subject is indicated to have oral health literacy. The Cronbach's alpha reliability coefficient was 0.904. Total oral health literacy scores divided into 4 levels (Davis *et al.*, 1991). Scores from 0-18 represented "level of 3rd grade", 19-44 corresponded to "4-6th grade level", 45-60 represented "7-8th-grade level", 61-66 corresponded to "level of over 9th grade".

An Oral Health Impact Profile (OHIP-14) developed by Slade (1997) was used to evaluate an oral health-related quality of life. It has a total of 14 items which has two questions in each domain including seven domains: physical disability, psychological discomfort, physical pain, functional limitations, psychological disability, social disability and handicaps. It was applied with a 5 point scale with scored scores ranging from 0-4. The higher the total score, the more negative influence the subject is indicated to have oral health-related quality of life. Potential count scores range from 0-56. The cronbach's alpha reliability coefficient was 0.936.

Data were analyzed descriptively to examine the characteristics of the participants, oral health literacy and oral health-related quality of life. ANOVA and t-test were conducted in order to examine the oral health literacy based on the characteristics of the participants. The relation of oral health literacy and oral health-related quality of life was estimated by the pearson correlation coefficients.

RESULTS AND DISCUSSION

General characteristics and difference in oral health literacy: As shown in Table 1, of 285 elderly persons, 52.6% of participants were males. Mean age was 76.00 years (± 6.72). 37.9% were the elderly living alone. The 40.7% graduated from elementary school 0.45.3% have an artificial tooth 0.33.3% represented "poor" subjective oral health status. A result of examining the differences in oral health literacy by general characteristics, there were significant differences by gender ($t = 4.08, p < 0.001$), age ($F = 7.35, p < 0.001$), spouse ($t = 3.80, p < 0.001$), cohabitant ($t = 2.13, p < 0.05$), education level ($F = 37.15, p < 0.001$), monthly income ($t = 2.64, p < 0.01$), job ($t = 3.86, p < 0.001$), use of artificial tooth ($t = -3.84, p < 0.001$) and subjective oral health status ($F = 8.73, p < 0.001$).

Oral health literacy and oral health-related quality of life: As shown in Table 2, the average of oral health literacy was 34.19 (4.54). Those of male and female were 37.44 (5.05) and female 30.58 (3.08), respectively. According to the classification of oral health literacy by REALM (Rapid Estimate of Adult Literacy in Medicine) (Davis *et al.*, 1991), 15.8% of participants were at a level of below 3rd grade, 57.9% were at a 4-6th grade level, 23.5% were at a 7th or 8th grade level, 2.8% were at a level of over 9th grade.

As shown in Table 3, the average of oral health-related quality of life was 14.27(2.04). Regarding the mean score of each domain, those of physical disability, psychological discomfort and physical pain were 2.14(± 2.24), 2.11(± 2.03) and 2.91(± 2.19), respectively. Those of functional limitations, psychological disability, social disability and handicaps were 2.51(± 2.43), 2.14(± 2.02), 1.36(± 1.79) and 1.60(± 1.97), respectively.

Correlation between oral health literacy and oral health related quality of life: As shown in Table 4, oral health literacy was correlated negatively with oral health-related quality of life ($r = -0.347, p < 0.001$). Oral health literacy and seven domains of oral health-related quality of life showed significant relationships. Negative correlations were found between oral health literacy and physical disability ($r = -0.263, p < 0.001$), psychological discomfort ($r = -0.324, p < 0.001$), physical pain ($r = -0.242, p < 0.001$), functional limitations ($r = -0.318, p < 0.001$), psychological disability ($r = -0.236, p < 0.001$), social disability ($r = -0.298, p < 0.001$) and handicaps ($r = -0.314, p < 0.001$).

This study was to examine the oral health literacy and oral health-related quality of life in community elderly and to identify their relationship. According to the classification of health literacy by Hwang (2010), health literacy scores from 0-44 represented a low health literacy level, 45-60 represented a marginal health literacy level, 61-66 represented a sufficient health literacy level. In the present study, 73.7% of participants appeared to have low oral health literacy, 23.5% have marginal oral health literacy, only 2.8% showed sufficient oral health literacy. This means that 3 of 10 elderly persons had a low oral health literacy level and most of the others correspond to the marginal level of oral health literacy. This result was consistent with the domestic research by Lee *et al.* (2014) reporting oral health literacy of elderly but this was at a much lower oral health literacy level compared to findings of research conducted oral health literacy of adults (Ju *et al.*, 2012; Jones *et al.*, 2007). The result of current study showed a very low oral health literacy of elderly. This shows that they have a problem with understanding

Table 1: General characteristics and difference in oral health literacy (N = 285)

Variables/Categories	Number	Percentage (%)	Mean (±SD)	t or F	Scheffe
Gender					
Male	150	52.6	37.44(±15.05)	4.08***	
Female	135	47.4	30.58(±13.08)		
Age					
65-69 ^a	64	22.5	40.53(±13.28)	7.35***	a>c, d
70-74 ^b	48	16.8	35.18(±14.65)		
75-79 ^c	77	27.0	33.61(±13.38)		
≥80 ^d	96	33.7	29.94(±14.81)		
Spouse					
Have	157	55.1	37.08(±14.06)	3.80***	
Not have	128	44.9	30.64(±14.37)		
Cohabitant					
Yes	177	62.1	35.62(±14.18)	2.13*	
No	108	37.9	31.85(±14.87)		
Education level					
No formal education ^a	30	10.5	23.26(±11.44)	37.15***	e>a, b, c, d
Elementary school ^b	116	40.7	28.33(±11.30)		
Middle school ^c	57	20.0	34.80(±12.20)		
High school ^d	58	20.4	43.13(±13.76)		
≥ Colleg ^e	24	8.4	53.12(± 8.35)		
Monthly income					
Yes	177	62.1	35.95(±14.23)	2.64**	
No	108	37.9	31.31(±14.64)		
Current job					
Yes	46	16.1	41.60(±14.19)	3.86***	
No	239	83.9	32.76(±14.19)		
Use of artificial tooth					
Yes	129	45.3	30.64(±14.18)	-3.84***	
No	156	54.7	37.13(±14.21)		
Subjective oral health status					
Bad ^a	95	33.3	30.12(±13.57)	8.73***	a<c
Moderate ^b	119	41.8	34.33(±14.63)		
Good ^c	71	24.9	39.40(±14.11)		

*p<0.05, **p<0.01, ***p<0.001; a-b Scheffe

Table 2: Oral health literacy levels by REALM (N = 285)

Score	Categories	Number	Percentage (%)	Mean (±SD)
0-18	0-3 (3rd grade in elementary school)	45	15.8	34.19 (±14.54)
19-44	4-6 (4th-6th grades in elementary school)	165	57.9	
45-60	7-8 (1st-2nd grades in middle school)	67	23.5	
61-66	≥ 9 (above 3rd grade in middle school)	8	2.8	

REALM = Rapid Estimate of Adult Literacy in Medicine

Table 3: Oral health-related quality of life (N = 285)

Domain	Mean (±SD)
Physical disability	2.14(±2.24)
Psychological discomfort	2.11(±2.03)
Physical pain	2.91(±2.19)
Functional limitations	2.51(±2.43)
Psychological disability	2.14(±2.02)
Social disability	1.36(±1.79)
Handicaps	1.60(±1.97)
Total	14.27(±12.04)

Table 4: Correlation between oral health literacy and oral health-related quality of life (N = 285)

Domain	Oral health literacy
Oral health-related quality of life	-0.347***
Physical disability	-0.263***
Psychological discomfort	-0.324***
Physical pain	-0.242***
Functional limitations	-0.318***
Psychological disability	-0.236***
Social disability	-0.298***
Handicaps	-0.314***

***p<0.001

of written health care information because persons with oral health literacy of level beyond the 12th grade (Hoc Committee on Health Literacy for the Council on Scientific Affairs, American Medical Association in 1999) can understand a lot of dental reading materials. Oral Health Impact Profile (OHIP) is one of the instruments which are evaluating an awareness of people of the physical, psychological, social effect of oral health (Slade, 1997). In this research, the average score of the oral health-related quality of life was 14.27. The findings of previous studies were lower (Zini and Coben, 2008; Lee and Kim, 2012) (10.43-10.45) or higher (Back, 2012) (26.2) scores compared to our finding. The mean scores of each domain in this study ranged from 1.36-2.91, social disability was the lowest score and physical pain scored the highest on seven domains. It is not consistent with the result of Back (2012) which reported that the mean scores of each domain ranged from 2.08-2.69, the mean scores of all domains except physical pain were higher than our study

and handicaps was the lowest score and functional limitation scored the highest on seven domains (Zini and Coben, 2008) demonstrated that this difference may include methodological issues such as data collection, sampling, reliability and validity of scale and cultural and socio-economical factors related to different participants. There has been little research focusing on the oral health-related quality of life of elderly in nursing (Lee and Kim, 2012). Thus, repeated studies are necessary to consider the oral health-related quality of life among the elderly.

Oral health literacy of this study had a significantly negative correlation with oral health-related quality of life. Oral health literacy was significantly correlated with seven domains of oral health-related quality of life. It indicates that elderly who had lower oral health literacy tend to have more difficulty of oral health and their oral health-related quality of life is lower in comparison with elderly who had higher oral health literacy. It is consistent with the result by Lee *et al.* (2007) which reported that oral health literacy was significantly related to the oral health-related quality of life. Poor oral health literacy may result in poor dental outcomes (Jones *et al.*, 2007). This result implies that oral health literacy is an important relationship with oral health-related quality of life and has an effect on well-being of elderly.

CONCLUSION

This study has tried to provide a basic data for developing effective intervention to improve the oral health literacy of elderly by figuring out the relation of oral health literacy and oral health-related quality of life.

In our research, a great number of elderly persons have low oral health literacy and oral health literacy has a correlation with oral health-related quality of life. Results of this study indicate that many elderly people have the difficulty of oral health and may hinder them from management and maintenance oral health because of low oral health literacy. Therefore, health care providers help elderly understand information related to oral health and identify them with low oral health literacy and. Also, it requires programs to improve the oral health literacy to manage effectively oral health of elderly.

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