Related Factors of Unmet Oral Health Requirements of Koreans: The 6th KNHANES (Korea National Health and Nutrition Examination Survey)

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Abstract : *Unmet oral health problems are reported to be serious in the world. This study was designed to identify the related factors of unmet oral health requirements in Koreans. 4404 subjects were chosen for the study of a cross sectional analysis. A comprehensive questionnaire and survey data were used and analyzed for the relevance of unmet oral health requirements by multi-level logistic regression with complex sampling methods. The most related factors of unmet oral health were limitation of activity (OR 1.93; 95% CI; 1.46-2.55; p<.001) and age, especially 35-64 year-old group (OR 1.76; 95% CI; 1.237-2.54; p=.002). And the other factor was lowest income (OR 1.37; 95% CI; 1.04-1.81; p=.027), lower education level (OR 1.27; 95% CI; 1.04-1.55; p=.021) and yes-spouse (OR 0.74; 95% CI; 0.59-0.93; p=.009). Strong unmet oral health requirements suggest that health care providers in the community must consider the presence of activity limitation, age, income, education levels and presence of spouse to develop various programs to improve oral health status in this growing population.*

Keywords : *age, limitations of activity, oral health, related factors, unmet requirements*

I. Introduction

Globally, unmet oral health requirements are rapidly growing. It is reported that physical activity, sedentary lifestyles and dietary patterns are determined by a combination of individual factors and environmental constraints and opportunities [1-3]. Also, ethnic differences of oral health and using dental services are reported that oral health inequality was more in non-white group who do not frequently use of dental services by recent UK 2009 Adult Dental Health Survey study [4]. And the Mexican elderly with BMI (25-<30) was less risk for disability and mortality [5]. In Europe, they have reported that high educational attainment controls the association of dental care utilization and supply [6]. And effective strategies in oral health care are needed and important to prevent or manage responsive behaviors of oral health care [7]. In Indian study, it is identified that high burden of unmet oral health needs and low utilization in dental care services is urgent necessity [8]. Therefore, this study was conducted to identify the related factors of unmet oral health requirements in Koreans.

II. Materials and Methods

2.1 The data
We analyzed the selected data from the 6th Korea National Health and Nutrition Examination Survey on website.

2.2 The subject
The missing variables were not included and used available questionnaire about the unmet oral health requirements and related factors.

1.3 Statistical methods
We analyzed a total of 4,407 subjects with 20 aged and over using complex sampling method to get demographic characteristics applied weighted frequencies and percentages. To know about the related factors on unmet oral health requirements, we analyzed using multi-level logistic regressions by SPSS (ver. 21.0).

III. Results

3.1 Test result
Table 1 shows the number and percentages of the subjects in each socio-economic and demographic group. 68.9% of the subjects were middle aged group (35-64). Mean age was 51. Over half of the subjects were female (54.1%). Most of the subjects (86.3%) were married and the lowest income group was only 16.8%. Almost all subjects were covered by public insurance and private insurance (77.9%). Around third-fourths

(79.6%) were living in urban area. Limitation of activity was reported by only 8.2% of the full subjects.

3.2 Test result

Table 2 shows the unadjusted OR of the subjects in each socio-economic and demographic group. Unadjusted analyses showed significant associations between the unmet oral health factors and limitation of activity(OR 1.94; 95% CI; 1.53-2.46; p<.001), no-spouse (OR 1.52; 95% CI; 1.23-1.88; p<.001), lowest income(OR 1.50; 95% CI; 1.21-1.86; p<.001), lower education level(elementary)(OR 1.45; 95% CI; 1.17-1.79; p<.001), female (OR 1.21; 95% CI; 1.06-1.37; p=.004), and not having private insurance(OR 1.16; 95% CI; 0.98-1.37; p=.008)

3.3 Test result

Table 3 shows the strong related factors of unmet oral health were limitation of activity(OR 1.93; 95% CI; 1.46-2.55; p<.001), middle aged group(OR 1.76; 95% CI; 1.24-2.54; p=.002), lowest income(OR 1.37; 95% CI; 1.04-1.81; p=.027), lower education level(OR 1.27; 95% CI; 1.04-1.55; p=.021), and yes-spouse(OR 0.74; 95% CI; 0.59-0.93; p=.009), than those of the other groups after adjusting. And the case of income, they had linear association of unmet oral health, as lowest income (OR 1.37; 95% CI; 1.04-1.81; p=.027), middle-low (OR 1.32; 95% CI; 1.08-1.61; p=.008), and middle-high (OR 1.25; 95% CI; 1.03-1.52; p=.023) than one of the highest income group.

Tables

Table 1. General characteristic of the subjects		
Variable		N(%)
age	20-34	412(12.52)
	35-64	2847(68.97)
	more than 65	1145(18.51)
Gender	male	1792(45.94)
	Female	2612(54.06)
income	lowest	914(16.77)
	middle-lowest	1145(25.76)
	middle-highest	1141(28.37)
	highest	1204(29.10)
education	elementary	1199(21.93)
	middle	516(11.19)
	high	1430(35.42)
	university	1259(31.47)
marital status	spouse	3702(86.26)
	no-spouse	702(13.74)
living area	urban	3479(79.59)
	rural	925(20.41)
insurance	Area	1430(32.76)
	Company	2819(64.16)
	Medicaid 1	111(2.09)
	Medicaid 2	42(0.96)
	Non	2(0.03)
Private insurance	yes	3225(77.86)
	no	1179(22.14)
limitation of activity	yes	431(8.18)
	no	3973(91.82)
	Total	4404(100.00)

Table 2. Related factors of unmet oral health			
	variable	OR(95%CI)	p
age	20-34	reference	
	35-64	1.13(0.93-1.37)	0.183
	more than 65	1.19(0.92-1.53)	0.580
Gender	male	reference	
	Female	1.21(1.06-1.37)	0.004
income	lowest	1.50(1.21-1.86)	<0.001
	middle-lowest	1.44(1.19-1.75)	<0.001
	middle-highest	1.28(1.05-1.56)	0.013
	highest	reference	
education	elementary	1.45(1.17-1.79)	<0.001
	middle	1.1400.88-1.48)	0.326
	high	1.19(0.99-1.44)	0.064
	university	reference	
marital	no-spouse	1.52(1.23-1.88)	<0.001

status			
	spouse	reference	
insurance	non		
	area	1.20(1.03-1.40)	0.380
	company	1.41(0.90-2.22)	0.315
	medicaid1	2.59(1.31-5.13)	0.439
	medicaid2	4.17(.26-68.06)	0.716
Private insurance	yes	reference	
	no	1.16(0.98-1.37)	0.08
Living area	urban	reference	
	rural	1.10(0.89-1.36)	0.367
Limitation of activity	no	reference	
	yes	1.94(1.53-2.46)	<0.001

Table3. Related factors of unmet oral health by Multiple-logistic regression		
Variable	OR(95%CI)	p
Age		
20-34	reference	
35-64	1.76(1.23-2.54)	.002
more than 65	1.35(1.09-1.67)	.006
Gender		
male	reference	
Female	0.99(0.86-1.14)	.919
Income		
lowest	1.37(1.04-1.81)	.027
middle-lowest	1.32(1.08-1.61)	.008
middle-highest	1.25(1.03-1.52)	.023
highest	reference	
Education		
elementary	1.30(0.99-1.706)	.061
middle	1.12(0.85-1.47)	.437
high	1.27(1.04-1.55)	.021
university	reference	
Marital status		
spouse	0.74(0.59-0.93)	.009
no-spouse	reference	
Insurance		
area	0.30(0.02-5.76)	.422
company	0.26(0.01-5.02)	.368
medicaid1	0.21(0.01-3.85)	.290
medicaid2	0.38(0.03-6.00)	.493
Private insurance		
yes	reference	
no	1.02(0.83-1.26)	.872
Living area		
urban	reference	
rural	0.99(0.81-1.22)	.947
Limitation activity		
no	reference	
yes	1.93(1.46-2.55)	<.001

IV.   Conclusion

Despite the diverse related factors affecting unmet oral health requirement, it is not known well about the concrete related factors on them in Korea.

In this study, we have identified that the strong related factors of unmet oral health requirements were limitation of activity, aging, income, education levels and presence of spouse. The most related factor of the unmet oral health requirements was limitation of activity, and this physical inactivity problem was explained as various aspects through the previous studies [9-11]. According to recent Korean study [12], parental and own education and income were significantly associated with the oral health and these were supporting our results.
By Canada and the United States study [13], the structural determinants of oral health were explained as age, education and income and these also have in common with our results.
Also, living in the area with rich social capital was associated with good oral health in Japan's study [14], and these showed the importance of the community environments though it was not significant in our study. And it was reported that lower income, especially less rich elderly was in the poor oral health status and identified not

to use dental services by recent study of the United States [15] and these results of income variable were in consensus with the result of ours. Furthermore, the need for unmet oral health were related with quality of life [16], and this findings means that for successful aging, it is need to assess the related factors of the unmet oral health requirements. And also, it may be considered and provided insights of policy perspective, as considering the characteristics of the individual and community levels for good oral health and fulfilling the unmet oral health requirements.

To improve and develop related factors for unmet oral health requirements in the community, it should be considered the socio-economic factors through our findings as well as including political and structural aspects in Korea.

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