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What influences use of dental services by the Korean disabled people? The role of perceived barriers in dental care system

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Objective: To identify the perceived barriers to dental care for disabled people in South Korea using the revised Andersen's model of access to health care. ***Basic research design***: Cross-sectional analytic interview study. ***Participants***: Korean people with a disability residing in residential facilities, or those at home who attend vocational rehabilitation facilities, special schools, or welfare facilities, were sampled from Seoul and non-Seoul areas in 2016 and were interviewed face-to-face. In total, 456 disabled Koreans, or their primary caregivers participated. ***Results***: Household income, disability duration and perceived barriers in the dental care system were perceived to impact on dental care utilisation, while the need for dental care services did not significantly explain the use of dental care by disabled people in South Korea. Those with low household incomes were less likely to use dental care services, compared to people with moderate and high household incomes. As disability duration increased, disabled people were more likely to use dental services. Those who perceived the barriers to dental care as higher were less likely to use dental services. ***Conclusion***: These data suggest that policies are needed to support disabled people with low household incomes. Lowering barriers in the dental care system may encourage people with disabilities to access timely and adequate dental services.

Keywords: *Barriers, dental care, disability, Andersen model, enabling factors, South Korea*

Introduction

People with disabilities have difficulties in maintaining oral health behaviours and show a higher incidence of oral diseases, such as dental caries and periodontal disease (Kim, 2001). It is essential for people with disabilities to receive proper dental care (Anders and Davis, 2010; Griffin *et al.*, 2012). However, they have greater barriers to care than non-disabled people. The US General Accounting Office identified unmet dental care needs as the most common unmet need for health services among children with disabilities (Schultz *et al.*, 2001). Low accessibility to dental care for disabled people is also apparent in South Korea (Choi, 2000; Shim *et al.*, 2010). However, oral health care issues for those with disabilities are a much-neglected area.

The provision of dental care to people with disabilities is limited in South Korea. In 1999, only 1.4% of the nation's dentists treated disabled people (Choi, 2000). Care for disabled people has been provided through public health centres or by volunteers. However, many public health centres provide screening and primary care only, and lack medical services; thus, people with disabilities cannot receive adequate and timely dental treatment. Since 2009, the Ministry of Health & Welfare and local governments have attempted to improve access to dental care for people with disabilities by establishing 10 dedicated Dental Care Centers for the Disabled across the country. However, care is still in very short supply.

The unmet oral health care needs of disabled people are high in South Korea. According to the 2013 National Survey, among 375 disabled persons, about one-third experienced unmet dental treatment needs (Jin, 2015) and most children with disabilities did not receive the required treatment (National Human Rights Commission of Korea, 2014). In addition, among those who received treatment, many used public health centres or voluntary organisations, with the proportion visiting dental clinics between 39–59%, which much lower than the 79.8% of non-disabled people (Kim *et al.*, 2005).

The best-known barriers to dental care among people with disabilities are the cost, lack of available services, lack of facilities and devices for disabled people, difficulties in behavioural control and communication and mobility difficulties (National Human Rights Commission of Korea, 2014; Hah *et al.*, 2000; Kim *et al.*, 2005; Jang *et al.*, 2016; Kim *et al.*, 2017). Among those, cost is identified as the major burden leading to unmet need (Thompson *et al.*, 2014; National Human Rights Commission of Korea, 2014); in one previous study, about half of disabled patients said that there was no dentistry readily available (Kim *et al.*, 2005).

This study aimed to identify the factors perceived to influence disabled people's use of dental care services using the revised Andersen model of access to health care. Its purpose was to contribute to establishing an environment where disabled people can use dental services at the same level as non-disabled people, and to improving the oral health of disabled people. To this end, the present study focused on explaining how the barriers faced by people

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with disabilities are perceived with respect to the dental care system, and how they impact on their use of dental services. The implications from this study are important to policymakers and dental service providers as well as to disabled people, because the proportion of people with special-care needs will inevitably increase in South Korea (Lee *et al.*, 2013). Understanding the barriers to dental care for disabled people and identifying factors that prevent them from obtaining dental care, will contribute to their use of timely and adequate levels of dental services.

Method

Data were collected from June 8 to November 2, 2016, in South Korea. Consecutive samples of persons with disabilities residing in residential facilities, or those at home who attend vocational rehabilitation facilities, special schools, or welfare facilities, were sampled from Seoul and non-Seoul areas. In total, 1104 people with disabilities were registered in the institutions of whom 798 agreed to take part, of whom 456 people provided complete data.

Face-to-face interviews were conducted with disabled people. Primary caregivers were surveyed if the person with a disability was not able to answer the questions. After removing missing values, data for 456 people were used for the final analysis. This study was approved by the Research Ethics Committee of Seoul National University College of Dentistry (IRB approval No. S-D20160014).

This study employed Andersen's behavioural model of health service utilisation to examine the perceived determinants of disabled people's use of dental care services. The initial model suggested that people's use of health services is a function of their predisposition to use those services, factors that enable or impede use, and their need for care (Andersen, 1995). In South Korea, people with disabilities may experience many obstacles in accessing or using dental care services under the current dental care system, which is primarily designed for non-disabled people. Thus, it is essential to understand how the health care system affects dental access for disabled people. Therefore, we employed the revised Andersen's model, which explicitly includes the health care system as an environmental enabling factor, giving recognition to the importance of health policy and the health care system in determining an individual's use of health care services (Andersen, 1995; Andersen, 2008). The empirical model of this study is described in Figure 1.

1. The predisposing factors are those that reflect 'a propensity toward use health care services which exists prior to the onset of illness' (Afilao *et al.*, 2004) include demographic, social structural and attitudinal-belief variables. In this study, age, gender, disability type, and disability duration were measured. Gender was measured as a nominal variable and age was measured as an interval variable. Disability type was measured based on the 15 classifications in the Welfare for the Disabled Act in South Korea, categorised into seven groups: people with physical disabilities affecting mobility (PHYSICAL), brain lesions (BRAIN), psychiatric disorders (PSYCHIATRIC), intellectual disabilities (INTELLECTUAL), autism disorders (AUTISM), multiple disabilities (MULTIPLE) and other types of disabilities (OTHER). The OTHER group included people with other physical disabilities, such as auditory/visual disabilities, facial nerve disorders and disabilities of the internal organs. The MULTIPLE group included people with more than two types of disabilities. Disability duration was measured as the years of having such a disability.
2. In the initial Andersen's model, enabling factors encompass variables related to an individual's resources that enable or impede their utilisation of health care. This study incorporated household income and the type of national medical support programme as the enabling factors. There are two types of national medical support programme in South Korea; the National Health Insurance programme and the Medical Aid programme. All Korean citizens are covered by one or the other.

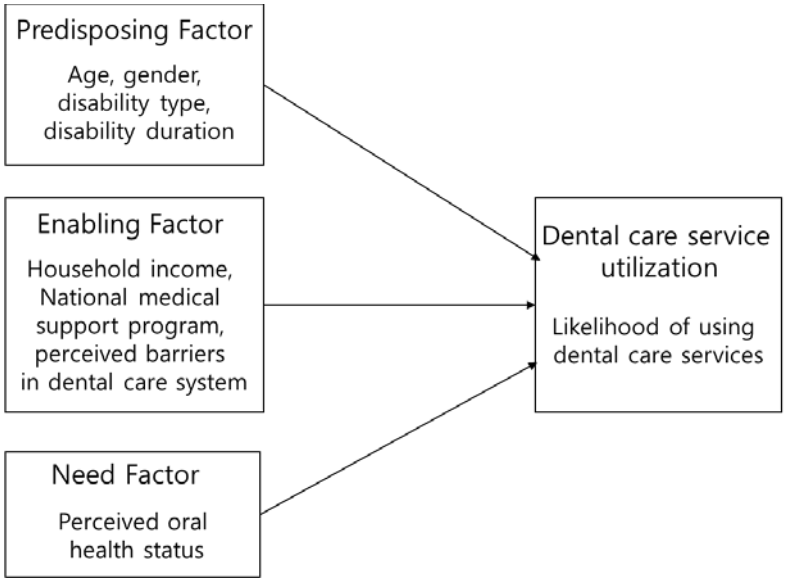

Figure 1. Empirical model derived from Andersen (2008).

The dental care coverage of the National Health Insurance programme is limited and the high out-of-pocket expenses for dental care services is one of the major obstacles that discourages people's use of necessary dental care services. However, households whose income and assets are below the poverty line qualify for the means-tested Medical Aid programme. Medical Aid beneficiaries must pay expenses for non-payroll items but, in the case of payroll items, there is almost no co-payment. This means that having the Medical Aid benefit can reduce the financial burden of using dental services. Thus, being supported the Medical Aid programme was included as an enabling factor in this study. Household income was measured in three categories: Low (household income of less than KRW 2,000,000), Middle (KRW 2,000,000 to KRW 4,000,000) and High (over KRW 4,000,000) (where £1≈KRW 1,500).

3. We measured disabled people's perceived barriers to the dental care system as an environmental enabling factor using the measure developed by Scheer *et al.* (2003); this comprises three subcategories: 1) barriers of organisation and resources, 2) barriers related to welfare and finance policies, and 3) barriers related to empathy and the accommodation of medical staff. These perceived barriers were assessed with 16 items using a 5-point Likert scale, with 1 representing the lowest levels of perceived barrier and 5 representing the highest.
4. Need refers to an individual's perceived and evaluated need for health care services in the Andersen's model. An individual's perceived oral health status was measured as a proxy for treatment need on a 5-point Likert scale, with 1 indicating very poor and 5 indicating very good health.
5. Health behaviour was measured as the dental care utilisation of disabled people. Participants were asked the likelihood of using dental care services when they perceived a dental care need, using a 5-Likert scale questionnaire.

Descriptive analyses were conducted to understand the levels of perceived barriers in the dental care system for people with disabilities. Multiple regression analysis examined the perceived predisposing, enabling and need predictors of dental care use of disabled people.

Results

The mean age of the 456 participants was 32.56 (SD=17.59) years, and almost 65% were male. About 65% of the participants had a household income below KRW 2,000,000 and 49.6% received Medical Aid programme benefits. Participants' other characteristics are presented in Table 1.

The level of the perceived barriers of the dental care system are presented in Table 2. The average level of the overall perceived barriers in the dental care system for disabled people was 3.51 (SD=0.87) on a 5-point Likert scale. Among the three subcategories, the perceived barriers relating to welfare and finance policies in dental care sector for disabled people scored the highest followed by barriers with the organisation and resources, and barriers with staff empathy and accommodation. Participants perceived that there were not sufficient dental staff specialising in treatment for disabled people and that there were too few facilities providing dental care for disabled people . People with disabilities also reported that it was difficult to join private health insurance and that the government's financial support for disabled people was not sufficient.

Multiple regression analysis was performed to identify the predisposing, enabling, and need factors perceived to determine dental care use (Table 3). The multiple regression models showed no problems with multicollinearity, autocorrelation, or normality.

Table 1. Characteristics of 456 participants with a disability

Variable	*Category*		*Frequency (n, %)*
Predisposing	Gender	Male	295 (64.7%)
		Female	161 (35.3%)
	Age (years)		Mean = 32.56 (SD=17.59)
	Disability duration (years)		Mean = 18.15 (SD=12.69)
	Disability type	Physical	36 (7.9%)
		Brain lesions	45 (9.9%)
		Intellectual	152 (33.3%)
		Autism	48 (10.5%)
		Psychiatric	87 (19.1%)
		Other	30 (6.6%)
		Multiple	58 (12.7%)
Enabling	Household income	Low	298 (65.4%)
		Middle	103 (22.6%)
		High	55 (12.1%)
	Medical support program	Receive Medical Aid	226 (49.6%)
		Receive NHI	230 (50.4%)
Need	Perceived oral health status		Mean=2.93 (SD=.97)

Table 2. Perceived barriers to dental care (N=456)

Categories	*Items*	*Mean (SD)*
Barriers on organisation and resources	Insufficiency of support services accessible to disabled people when visiting dental care facilities	3.50 (1.03)
	Insufficiency of medical facilities providing dental care services	3.66 (1.10)
	Inappropriateness of the operating hours of dental care facilities	3.19 (0.99)
	Inadequacy of convenience and safety features within dental care facilities for disabled people	3.48 (1.05)
	Inadequacy of diagnostic and treatment equipment in dental care facilities	3.48 (1.08)
	Insufficiency of dental medical staff specialising in treatment of disabled people	3.83 (1.06)
	Overall	3.52 (0.92)
Barriers on welfare and financial policy	Inadequacy of the National Health Insurance coverage for the dental care of disabled people	3.51 (1.07)
	Inadequacy of additional support for medical fees of disabled people by dental care providers	3.57 (1.09)
	Inappropriateness of dental care cost relative to income levels of disabled people in Korea	3.62 (1.01)
	Difficulties of enrolment in private medical insurance for disabled people	3.78 (1.02)
	Inadequacy of financial support for disabled patients by the government	3.79 (1.05)
	Overall	3.65 (0.92)
Barriers on empathy and accommodation of the staff	Inadequacy of effort by dental care providers to accommodate disabled people	3.33 (1.09)
	Inadequacy of specialised knowledge about treating disabled people in dental care providers	3.41 (1.04)
	Lack of favourable attitudes of dental care providers towards disabled people	3.29 (1.02)
	Lack of proficiency of dental care providers in treating disabled people	3.40 (1.03)
	Low level of communication between dental care providers and disabled people	3.40 (1.04)
	Overall	3.37 (0.93)
Overall perceived barriers in the dental care system for disabled people		3.51 (0.87)

Table 3. Predictors of dental care utilisation (N=456)

B *SE*			*95% CI*			
Predisposing	Age		-0.00	0.00	-0.01.	0.01
	Gender	Female	-0.02	0.11	-0.24	0.20
	Disability type	Physical	-0.10	0.29	-0.67	0.48
		Brain	-0.12	0.27	-0.40	0.65
		Intellectual	-0.04	0.23	-0.50	0.42
		Autism	-0.20	0.27	-0.72	0.33
		Psychiatric	-0.54	0.26	-1.04	-0.04
		Multiple	0.31	0.26	-0.24	0.83
	Disability duration		0.01	0.01	-0.00	0.02
Enabling	Household income	Low	-0.32	0.15	-0.62	-0.02
		High	-0.25	0.19	-0.13	0.63
	Medical support programme	Medical Aid programme	0.00	0.13	-0.25	0.24
	Perceived barriers		-0.62	0.07	-0.75	-0.49
Need	Perceived oral health status		0.04	0.06	-.07	.0.15
Adj.R^2, F			0.22, 8.87 (p=0.000)			

According to the model, the predisposing, enabling, and need factors explained about 22% of the variance of individuals' dental care utilisation. Among the predisposing factors, disability duration and having a psychiatric disability were significant predictors of dental service use, such that disabled people who had experienced disabilities for longer and who had a psychiatric disability were more likely to use services. Among the enabling factors, those with low household income were less likely to use dental care services compared to disabled people with a moderate or high levels of household income, while no differences were found between the middle- and high-income groups. Participants who perceived the barriers as higher for disabled people, were less likely to use dental services. The need for dental care, which was measured using perceived oral health status, did not predict dental care utilisation.

Discussion

This study aimed to identify the factors perceived to influence disabled people's use of dental care services among South Koreans. Disabled people who had experienced disabilities for longer, had a psychiatric disability, had higher household income or who did not perceive the barriers as higher for disabled people were more likely to use dental services.

The results suggest that those with low household income and people with a shorter period of disability may be giving up dental care and have unmet need services. Therefore, education and policy support may be needed to enable them to use an appropriate level of dental care.

It is possible that those who have been disabled for a short duration are adapting to their disability and may have difficulties in getting dental care services due to the lack of information and networks for social support for disabled people. Thus, information, promotion of services and social policies may be needed, not only for people who have a long-term disability, but also for recently disabled people and their families, who are relatively inexperienced or unable to adapt to their disability.

While this study found that low household income predicted lower dental care utilisation, receipt of Medical Aid benefit was unrelated to dental care use. In South Korea, households with income below the poverty line receive benefits from the Medical Aid programme. Receipt of Medical Aid benefit has frequently been employed frequently to evidence moral hazards in health care utilisation. A moral hazard is said to occur when people adopt a behaviour (in this case greater use of healthcare) because they will not carry the cost. However, this study did not find a significant moral hazard in dental care utilisation among disabled people due to the Medical Aid programme.

The finding that the need for dental care did not predict disabled people's use of dental health care services suggest that people with disabilities did not fully utilise dental services, despite their need for dental care. Also, the negative relationship between perceived barriers in the dental care system and dental care utilisation implies that the barriers in the dental care system significantly prevent disabled people from using adequate dental care services in South Korea. Thus, it is necessary to establish a dental care system that is favourable to people with disabilities in order to encourage them to use dental care services and to avoid unmet needs for dental treatments.

Like all research the present study had some limitations. We were not able to sample people with various types of disabilities proportional to the population. In addition, we were not able to examine the influences of dental care utilisation on outcome variables, such as objective oral health status and consumer satisfaction.

Conclusions

This study aimed to identify the factors perceived to influence disabled people's use of dental care services using the revised Andersen model of health care utilisation to explain perceived barriers affect the dental care utilisation among Korean disabled people. Perceived barriers in the dental care system appeared to inhibit dental care utilisation.

These data have policy-based and practical implications for establishing an equitable dental service for people with disabilities in South Korea, so that they can use dental care services whenever they need treatment. Establishing an environment in which disabled people can access dental services easily will contribute to promoting their oral health. Continued research is demanded for the better understanding of disabled people's behaviours to obtain dental care.

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