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#### Research Paper

### Smoking behaviors among people with disabilities in Korea

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#### Abstract

**Background:** Most reports concerning smoking behaviors in people with disabilities have been from Western societies; knowledge of smoking behaviors in Asian countries, including Korea, is insufficient.

**Objectives:** This study investigates the smoking behaviors of people with a disability compared to the general population in Korea. **Methods:** We compared the smoking behaviors of people with a disability with the general population by using datasets from the 2011 National Survey of Disabled People and an age- and sex-matched random sample from the 5th Korean National Health and Nutrition Examination Survey. Random samples of people 18 years of age and older with disabilities (n = 5636) and of the general population were used (n = 5636). The main outcome measures include smoking behaviors by type, severity, and age at disability onset.

**Results:** People with a mental or physical impairment have higher current smoking rates (38.1% and 26.3%, respectively) than the general population (23.3%). In particular, current smokers with psychiatric impairment were more likely to smoke more than 20 cigarettes a day (61.2%). People with a disability, regardless of severity or age at onset, were less likely than the general population to have attempted to quit smoking.

**Conclusions:** Smoking behaviors differed according to the type of disability. These results suggest that interventions for smoking prevention and cessation need to be tailored according to disability characteristics. © 2014 Elsevier Inc. All rights reserved.

Keywords: Disabled persons; smoking; Health care disparity

Cigarette smoking is associated with chronic morbidity and mortality, and is recognized as the single largest preventable cause of diseases such as lung cancer, chronic obstructive pulmonary disease, and cardiovascular disease. 1,2 People with disabilities who smoke increase their risk of developing secondary conditions that might adversely interact with their primary disability. 3,4 Smoking can exacerbate the severity of existing disabling conditions while creating new conditions. For example, smoking is associated with a loss of muscle strength and endurance in people with impaired mobility. 6,7

However, many studies have reported higher smoking rates in people with disabilities than in the general population.<sup>3,4,8-12</sup> In addition, people with disabilities are less likely to be targeted by smoking cessation policies. Due

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to lack of information and problems with physical access, people with disabilities have limited exposure to smoking cessation services or programs. <sup>7,8,12</sup>

Most reports concerning smoking behaviors of people with disabilities come from Western societies, and there is a lack of knowledge of smoking behaviors in Asian countries, including Korea. The purpose of this study was to investigate smoking behaviors in Korea among people with a disability compared to those in the general population. The results of this study could be used to establish targeted strategies for smoking cessation in people with disabilities.

#### Methods

#### Data sources and study sample

The sample population was drawn from the 2011 National Survey of Disabled People (NSDP 2011), a nationwide cross-sectional survey conducted every three years by the Korean Ministry of Health and Welfare. It evaluates

the prevalence of disabilities and documents fundamental data relating to the health care and welfare status of people with a disability.

Using a stratified probability sampling approach, the NSDP 2011 survey conducted household visit interviews with non-institutionalized persons with and without disabilities. Weight variable was provided by the NSDP to adjust the sample data to reflect age and sex distribution of all Korean populations with disabilities. The NSDP questionnaire consisted of two parts: (1) a set of basic household information and disability items to determine members with disabilities in the household, and (2) a set of in-depth interview questions to collect detailed information on health, welfare, education, work, and daily life experiences, as well as sociodemographic information from family members with disabilities. A total of 38,232 households completed the basic interview, and the final sample size that completed the indepth interview included 5628 households and 6010 persons with disabilities. A total of 5636 registered people with a disability aged 18 years and older were included in this study.

The study population of 5636 people with a disability was compared to an age- and sex-matched sample randomly selected from data from the 2010 and 2011 5th Korean National Health and Nutrition Examination Survey (KNHANES V). KNHANES V is a nationwide representative survey of the general population with a stratified, multistage-clustered probability sampling design. This survey has been conducted by the Korean Ministry of Health and Welfare and the Center for Disease Control to evaluate the health and nutritional status of Koreans since 1998. The surveys included a general health interview questionnaire, nutrition survey, and health examination survey. The general health interview survey comprised self-administered questionnaires administered to all family members across selected households; the total number of respondents was 8473 in 2010 and 8518 in 2011. There are differences in the distribution of demographic characteristics, such as sex and age, between the 2011 NSDP and the KNHANES V. For one, the disability group had more men and seniors. In order to compare smoking prevalence between groups with similar characteristics, we matched two data using the sex and age variables as categories (18-44, 45-64, 65 years and older). This study selected 5636 people (3216 men and 2420 women) from a total sample of 8473 people aged 18 years and older.

#### Measurement

#### Disability characteristics

The types and severities of disabilities used in this survey are according to the guidelines of the National Disability Registration System, which has been administered by the Korean Ministry of Health and Welfare since 1988, and is based on the Korean Disability Act (KDA) to establish a welfare delivery system for disabled persons. According to the

National Disability Registration System, disabilities are divided into 15 types and 6 grades from very severe (1) to mild (6). The disability types include mobility, brain, visual, auditory, and linguistic impairment; facial deformity, and renal, heart, liver, respiratory, intestinal and urinary tract dysfunction; epilepsy, mental retardation, developmental disability, and psychiatric impairment. If people diagnosed with a disability voluntarily apply for disability registration, they are registered into the system after passing the disability grade examination. Disabilities that get a grade 1 to 2 are generally classified as severe. In 2010, 2,520,000 people with a disability were registered under this system, which represented more than 5% of the national population.

We used three disability-related questions from the NSDP 2011 to determine: (1) the type of disability, (2) the severity of disability, and (3) the age at disability onset. The survey asked respondents the type and grade of disability they had as it was mentioned on the record of the registration system. For this study, we classified the 15 types of disabilities into seven categories: mobility, brain, visual, auditory, intellectual (mental retardation, developmental disability, and linguistic impairment), psychiatric, and chronic. People with psychiatric conditions such as mood disorders and schizophrenia were included in the psychiatric impairment group. Chronic conditions include impairment of renal, heart, respiratory, liver function, etc. The severity of the disability was based on the grade and reclassified as severe (grades 1 and 2) or moderate (grades 3-6).<sup>13</sup> People were grouped by age at disability onset (before or after 14 years of age).

#### Smoking behaviors

We used three questions from the 2011 NSDP and the KNHANES V to assess smoking behaviors. Respondents were asked if they currently smoke cigarettes daily, occasionally, are former smokers, or have never smoked. Those who answered that they smoke at least some days were classified as current smokers. Respondents who indicated that they smoke every day or occasionally were then asked two additional questions. One was related to cigarette amount: "How many cigarettes do you smoke a day"? The other question was about smoking cessation attempts: "During the past 12 months, have you stopped smoking for at least one day because you were trying to quit"? Respondents who answered "yes" were considered to have attempted to quit in the past year.

#### Socio-demographic characteristics

The identical socio-demographic survey characteristics from the 2011 NSDP and the KNHANES V were used. Demographic factors included sex, age (18–44, 45–64, 65 years and older), marital status (married, unmarried, divorced/separated/widowed), educational level (less than elementary school, middle-school graduate, high-school

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