Background: The rate of cigarette smoking among female is relatively low in East Asian countries. This study was performed to determine the rate of cigarette smoking among cosmetics sales workers and to analyze the factors related to this behavior.

Methods: A self-reported questionnaire was administered to approximately 3,300 cosmetic sales workers employed by major department stores in South Korea. Of the 667 questionnaires returned, 507 were analyzed after excluding missing or inaccurate data. The rate of cigarette smoking and associated factors were analyzed via the chi-square test, t-test and multiple logistic regression analysis.

Results: The prevalence of cigarette smoking among female cosmetics sales workers was 40.6%. Workers were more likely to smoke cigarettes if they had a lower level of education than a higher level of education (odds ratio (OR), 1.91, 95% confidence interval (CI), 1.31-2.78), according to the results of a multivariable adjusted logistic regression analysis that accounted for age, marital status, mental health, alcohol use, care giving status and self-rated health. The ORs of smoking for unmarried workers, workers who were not caregivers, workers with poor self-rated health and poor mental health were > 1, but this finding was not significant. Compared to the general population, a greater proportion of people in the study population were “ever smoker” (22.9% vs. 55.4%).

Conclusion: The rate of cigarette smoking was much greater among female cosmetics sales workers in Korea than among the general population. Targeted tobacco control policy is urgently needed for this subgroup.

Key Words: Female; Smoking; Prevalence; Korea; East Asia

According to recent national surveys in China, Hong-Kong, Japan, and Taiwan, the prevalence of cigarette smoking among female ranges from 2.6% in China to 12.0% in Japan.
The rate of cigarette smoking in South Korea is thought to be very low among females and very high among males. (1) According to several national surveys of cigarette smoking behaviors in South Korea (Figure 1), the rate of female smoking is less than 8%. (7) Several Korean studies have examined female smoking rates by year, age, occupation, marital status, and socioeconomic position, (6,8–9) but have not detected rates greater than 20% after the year 2000. However, an unpublished case study found that the rate of cigarette smoking is approximately 40% among female sales workers at a department store (personal communication with Lee YJ, 2009).

Prompted by that report, we conducted a more extensive survey of smoking habits among cosmetics sales workers in several department stores and examined the factors associated with this group’s behavior. This cross-sectional survey is especially important, as it challenges the prevalent belief that East Asian women rarely smoke cigarettes. A better understanding of the causes of cigarette smoking among female workers can help South Korea and East Asian countries to develop more effective tobacco control policies that target the female population.

Methods

1. Study Subjects

We performed a cross-sectional study of female sales workers employed by department stores in Korea between February 2008 and July 2008. The study subjects were members of trade unions representing four cosmetic companies. We distributed and collected questionnaires through the trade union leaders of the cosmetics companies. Of approximately 3,300 female cosmetics sales workers, 920 questionnaires were distributed to members of trade unions. The trade union leaders have not noticed or reported differences in smoking behaviors between members of trade unions and non-members. Study subjects were told that they were participating in a survey on general health status. Of a total of 920 questionnaires, 667 were completed and collected (response rate: 72.5%). Of those 667 questionnaires, 596 female workers reported smoking behaviors and the smoking rate was 40.3% (240/596). Among these 596 workers, 507 were included in the analysis after excluding subjects from whom data were missing or inaccurate.

Smoking habits of the study subjects were compared with representative national data of Korean women by randomly selecting samples from the Korean National Health and Nutrition Examination Survey (KNHANES) performed in 2007, with a 1:1 frequency matching in 5 year age groups. The 2007 KNHANES consisted of 4,594 adults (2,097 men and 2,497 women) that were systematically sampled from the Korean population. (7) This study was approved by the Asan Medical Center Institutional Review Board, Seoul, Korea.

2. Outcome and dependent variables

Current cigarette smoking was assessed by the question “Do you smoke cigarettes now?” (possible responses included, “Yes, I smoke”; “I smoked before, but I quit smoking”; and “I have never smoked”). Subjects who responded, “Yes, I smoke,” were considered current smokers.
Dependent variables included socio-demographic characteristics, alcohol drinking, self-rated health, and mental health as measured by the mental health section of the SF–36.(10) Educational attainment was classified as \( \leq 12 \) years and \( > 12 \) years. Marital status was grouped into married and unmarried (i.e., unmarried, divorced or widowed). Alcohol use and caregiving status (to a child or elderly) were assessed as ‘yes’ or ‘no’ responses. Self-rated health was measured by the question, “How is your current health state?” with five answer categories ranging from “very good” to “very poor”. The categories “fair”, “poor”, and “very poor” were combined to yield a new category of ‘less than good health’. Mental health was evaluated according to the SF–36 Mental Health section and divided into ‘poor’ (i.e., less than 50 points) and ‘good’ (i.e., equal or greater than 50 points) mental health.

### 3. Statistical analysis

Chi square tests and t-tests were used to compare the characteristics of the study subjects. Multiple logistic regression analysis was performed with smoking status as a dependent variable, while adjusting for education level, marital status, age, alcohol use, care giving status, self-rated health, and mental health. The smoking habits of the study subjects and an age–matched sample from KNHANES were compared using chi square tests for categorical outcome variables and t-tests for numeric outcome variables. All statistical analyses were performed using SPSS version 18.

### Results

The mean age of the study subjects was 26.9 years (range 19 to 39 years), approximately 50% of the subjects graduated from high school, and more than 75% of the subjects were married (Table 1). More than 80% of the study population considered themselves to have ‘poor’ health and approximately 40% received less than 50 points (i.e., with complete mental health indicated by 100 points) on the mental health section of the SF–36. The prevalence of cigarette smoking among female cosmetic sales workers in department stores was 40.6% and did not differ according to age (Table 2). Univariate analysis revealed that the rate of cigarette smoking was higher among workers with lower levels of education (\( \leq 12 \) years) compared with workers who had attained a higher level of education (\( > 13 \) years) (47.4% vs. 32.8%, respectively). Workers who had poor self-rated health and poor mental health had a marginally higher rate of smoking compared with subjects who had good self-rated health and good mental health. Female workers who were married, drank alcohol, and were not caregivers had higher rates of cigarette smoking than did other subjects, although these differences were not statistically significant.

### Table 1. General characteristics of the study subjects (N=507).

| Variables                  | No. (%) |
|----------------------------|---------|
| Age (years) mean ± SD (range) | 26.8±4.0 (19-39) |
| <30                        | 390 (78.9) |
| ≥30                        | 117 (23.1) |
| Education (years)          |         |
| >12                        | 235 (46.4) |
| ≤12                        | 272 (53.6) |
| Marital status             |         |
| Married                    | 113 (22.3) |
| Not married*               | 394 (77.7) |
| Care giving to children or elderly |     |
| No                         | 418 (82.4) |
| Yes                        | 89 (17.6)  |
| Self-rated health          |         |
| Good                       | 78 (15.4)  |
| Poor                       | 429 (84.6) |
| SF-36 MH †                 |         |
| <50 (poor)                 | 300 (59.2) |
| ≥50 (good)                 | 207 (40.8) |
| Alcohol use                |         |
| No                         | 103 (20.3) |
| Yes                        | 404 (79.7) |
| Total                      | 507 (100.0) |

*Not married* includes never married, divorced and widowed. †SF-36 MH refers to the SF-36 mental health section.
The OR for smoking among subjects with lower levels of education was 1.91, which was statistically significant when we performed multi-variable adjusted logistic regression analysis adjusted for age, marital status, alcohol use, caregiving status, self-rated health, and mental health (Table 2). The ORs for smoking among workers who were not married, not caregivers, had poor self-rated health, and poor mental health were >1, but this finding was not statistically significant (Table 2).

Table 3 compares the smoking behaviors of the study subjects with an age-matched sample from the 2007 KNHANES. 'Ever' smokers (i.e., including current smokers and ex-smokers) were more prevalent among the study population than among the general population (55.4% vs. 22.9%, respectively), mainly due to differences in current smoking rates. The number of cigarettes consumed per day was lower among study subjects than among the national sample (7.4 vs. 10.1, respectively). However, there was no difference among study subjects and the general population with regards to age at initiation of cigarette smoking (18.4 years old vs. 18.7 years old, respectively), attempts to quit smoking (66.2% vs. 61.4%, respectively), and intending to quit smoking within 1 month (15.1% vs. 17.5%, respectively).

**Discussion**

This study found an unexpectedly high rate (greater than 40%) of cigarette smoking rate among South Korean female cosmetics sales workers. Such a high prevalence of female smoking has not been observed previously in East Asian countries.(1,2)
Table 3. Comparison of the smoking behaviors of study subjects and an age-matched sample from the KNHANES III (N=507 from each source). % (N)

|                                      | Subject of this study (N=507) | Sample from KNHANES* (N=507) | P-value |
|--------------------------------------|------------------------------|-------------------------------|---------|
| Current smoker                       | 40.6% (206)                  | 11.4% (58)                    | <0.0001† |
| Ex-smoker                            | 14.8% (75)                   | 10.5% (63)                    |         |
| Never smoker                         | 44.6% (226)                  | 78.1% (396)                   |         |
| Age of initiation of cigarette smoking (years), mean (SD) |                          |                               |         |
| Before entering department store     | 18.4 (3.1)                   | 18.7 (3.7)                    | 0.493†  |
| After entering department store      | 87.3% (180)                  |                               |         |
| Number of cigarettes smoked per day [mean (SD)] | 7.4 (4.4)                   | 10.1 (7.2)                    | 0.001†  |
| Percent of smokers who attempted to quit smoking in the previous year | 66.2% | 61.4% | 0.504‡ |
| Percent of smokers who planned to quit smoking |                           |                               | 0.320‡  |
| In 1 month                           | 15.1% | 17.5% |         |
| In 6 months                          | 21.0% | 29.8% |         |
| After 6 months                       | 44.4% | 31.6% |         |
| No plan                              | 19.5% | 21.1% |         |

*KNHANES: Korean National Health and Nutrition Examination Survey (2007). †t-test. ‡Chi square test.

The high prevalence of cigarette smoking among female cosmetics sales workers is unlikely to reflect sample selection bias due to the following reasons. First, the study subjects were representative of female cosmetics sales workers in major department stores in Korea. About 20% of the female cosmetics sales workers employed by major department stores participated in this survey, and there was no bias according to area or department store. As we intended to survey the general health status of these cosmetics workers, we believe that our sampling process was not influenced by smoking status. The survey questionnaires were delivered to each worker by fellow workers who might know each worker’s smoking status, so the possibility of underreporting is low. Second, an unofficial case report by an independent researcher (personal communication by Lee YJ, 2009) that 40% of the female sales workers of a single department store may support validity of this study. However, considering the still-existing social stigma toward female cigarette smoking in Korea, we do not believe the high smoking rate is due to over-reporting. Therefore, the high prevalence of cigarette smoking among female cosmetics sales workers in Korea seems authentic.

The challenge, then, is to explain why these workers have such a high prevalence of this behavior. There are three possible, not mutually exclusive, explanations—namely, delayed diffusion, social repression, and under-reporting—for the low prevalence of smoking among Korean women, which may also explain the high smoking rate among female cosmetics sales workers. According to the tobacco epidemic transition theory, female smoking in Western countries has followed male smoking and peak tobacco consumption levels among females have been lower than those of males. Same pattern can be applied to Korean women.(11) In East Asian countries, where the influence of Confucianism remains strong, female smoking is not considered socially acceptable.(12) When female smoking was considered socially undesirable, Korean women tended to underreport their smoking habits.(13) Because cosmetics workers are perceived as exemplifying women’s power and rebellion,(14) it is conceivable that cosmetics sales workers can respond to these values more sensitively and this may contribute rate of cigarette smoking to increase in this group.

Cosmetics sales worker are relatively free from the social stigma against smoking because they mostly work and
take breaks with female co-workers in department stores. Underreporting may underestimate the prevalence of smoking in this group, but the extent of underreporting may be lower compared with the general public for the reasons mentioned above. In addition, the harsh working circumstances of the cosmetics sales workers may be an important factors involved in the high smoking rate.\(^{(15)}\) The smoking rate among Korean females is higher among sales workers, and among service workers compared with clerks.\(^{(9)}\) Many workers suffer from the stress associated with encountering difficult customers.\(^{(15)}\) These workers are not only under the supervision of the managers in the workplaces, but are also within sight of the customer.\(^{(16)}\) In this situation, a stress-relieving measure may involve smoking a cigarette during break time with fellow workers. Unfavorable working conditions may contribute to the high smoking rate by preventing female workers from quitting smoking rather than by preventing the initiation of smoking. Considering that approximately 90% of the smokers began smoking before they began their current job, these findings suggest that teens who smoke cigarettes may choose cosmetics workers as their careers more frequently.

The smoking rate among lower educational achievement was higher than higher educational group, which is similar to the findings of Korean\(^{(6)}\) and Western studies.\(^{(17-18)}\) In addition, the smoking rates of unmarried workers, noncaregivers, and those with poor self-rated health and poor mental health were greater than the smoking rates of others, which is consistent with previous studies.\(^{(8,19-21)}\)

Considering the similar previous quit attempts and planning of quitting between cosmetic workers and general population, stronger support to overcome barriers to quit smoking may help to quit smoking in these subjects.

This study has several limitations. Because we could not study a representative sample of the cosmetics sales workers, generalization of the results can be limited. However, we do not believe that our point estimate for smoking rate is overestimated considering the reasons mentioned above. Information about smoking status was self-reported, which may have resulted in an underestimation of smoking rates. Moreover, definition of smoker in this study was not same with KNHANES, however, this may not materially bias the results.

Conclusions

In conclusion, the rate of cigarette smoking among female cosmetics workers in South Korea was unexpectedly high (>40%). Although cosmetic workers only comprise a small proportion of Korean females, it shows that very high smoking rate may be possible in Korea. Therefore, there is an urgent need for more targeted tobacco control policies. Considering the generally low rates of female smoking and the cultural attitudes toward this behavior, similar surveys of the smoking habits of cosmetics sales workers are needed in East Asian countries.

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HJC and YHK conceived and designed the study. HJC, KHJC, and KEY performed the survey and analyzed the data. HJC drafted the manuscript and all authors contributed to critical interpretation of the manuscript.

요 약

연구배경: 동아시아 여성에서 흡연율은 매우 낮게 나타난다. 이 연구는 여성 화장품 판매직 여성의 흡연율과 흡연에 영향을 주는 요인을 알아보기 위한 것이다.

방법: 한국의 주요 백화점의 화장품 판매직 여성 3,300 명에 대해 자가보고 설문조사를 시행하였다. 667명이 설문에 응답하였고, 응답이 불충분한 설문을 제외한 507개의 설문을 분석하였다. 흡연율과 이에 영향을 주는 요인은 카이제곱 검정, t 검정, 다변량 로짓 회귀분석을 이용하여 분석하였다.

결과: 여성 화장품 판매 직원의 흡연율은 40.6% 이었다. 다
변량 로짓 회귀분석에서 연령, 결혼상태, 정신건강, 알코올 사용, 케어제공 여부를 보정하였을 때 학력이 낮은 경우가 높은 경우에 비해 흡연율이 높았다(교차비, 1.91, 95% 신뢰 구간, 1.31-2.78). 결혼을 하지 않은 경우, 케어제공을 하지 않는 경우, 자기보고 건강상태가 나쁜 경우, 정신건강이 나쁜 경우에 그렇지 않은 경우에 비해 교차비가 1 이상이었으나, 통계적으로 유의하지는 않았다. 일반 인구와 비교하였을 때, 이 연구에서는 흡연경험이 있는 사람의 인구가 더 늘었다(55.4% 대 22.9%).

결론: 한국에서 화장품 판매직 여성의 흡연은 일반 인구에 비해 매우 높았으며, 이 하위집단을 목표로 한 담배규제정책이 필요하다.

중심단어: 여성; 흡연; 유병률; 한국; 동아시아

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