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Smoking among Individuals with Schizophrenia in Korea: Gender Differences

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Abstract

Objective—This study examined gender differences in smoking and quitting among individuals diagnosed with schizophrenia in Korea. In addition, the study investigated differences in caffeine use by gender and smoking status.

Method—An anonymous self-report survey was conducted with psychiatric inpatients.

Results—Compared to males, females were less likely to be current smokers ($p < 0.001$) and more likely to be former smokers ($p < 0.01$). Females were also less likely to be daily caffeine users ($p < 0.001$). Having more years of education ($p < 0.05$) and higher nicotine dependence scores ($p < 0.05$) were associated with decreased odds of intending to quit smoking, whereas having more previous quit attempts ($p < 0.01$) was associated with increased odds. These findings were significant even after adjusting for gender. Smokers were more likely to be daily caffeine users ($p < 0.001$) than their non-smoking counterparts.

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Conclusion—Nurses in Korea should play an active role in tobacco control for patients with schizophrenia by providing cessation counseling and educating the effect of caffeine use on cigarette consumption, while tailoring the service to gender differences found in this study.

Keywords

schizophrenia; smoking; gender; Korea; caffeine use

INTRODUCTION

Smoking continues to be one of the major leading preventable causes of morbidity and premature mortality in the general population and among individuals with mental illness (Chang et al., 2011; Kelly et al., 2011; Kotov, Guey, Bromet, & Schwartz, 2010). Individuals with schizophrenia have higher rates of tobacco use, smoke more heavily, and have higher rates of tobacco-related morbidity and mortality than the general population (Cooper et al., 2012; de Leon & Diaz, 2005; Ziedonis et al., 2008). In the United States, individuals with schizophrenia die on average 25 years earlier than the general population (Parks, Svendsen, Singer, & Foti, 2006). This increased mortality rate is largely due to treatable medical conditions and smoking has long been recognized as one of the major causes (Parks et al., 2006). In 2011, 64% of individuals with schizophrenia were current smokers as compared to 19% of individuals without mental illness (Dickerson et al., 2013). A recent report indicated that a standardized mortality ratio for cardiovascular deaths was about 3 times greater in individuals with schizophrenia than in the general population (Kelly et al., 2011; Kelly et al., 2012). Furthermore, among individuals with schizophrenia, smokers had a 12-fold increase in the risk of cardiac-related mortality as compared to nonsmokers.

There are many biological and psychosocial factors contributing to the high rate of tobacco use among individuals with schizophrenia, including lower socioeconomic status and the effects of nicotine on neurocognition (American Psychiatric Association [APA], 2006; Ziedonis, Kosten, Glazer, & Frances, 1994). Some scholars explained the high association in light of “self-medication” theory to deal with psychiatric symptoms such as auditory verbal hallucinations (APA, 2006; Umbricht & Krljes, 2005). A laboratory study of individuals with schizophrenia revealed that acutely administered nicotine normalizes neural systems specific for processing intensity deviants by the activation of $\alpha 7$ nicotinic acetylcholine receptors (Dulude, Labelle, & Knott, 2010). This finding indicated that acute nicotine administration helps schizophrenia patients screen irrelevant stimuli (i.e., auditory verbal hallucinations) from awareness, which would free up auditory cortical resources normally usurped by the stimuli (Fisher et al., 2012).

Unlike the increased prevalence of smoking found in Western countries, however, no difference was found between individuals with schizophrenia and the general population in Asian countries such as China and Korea (Bahn & Cho, 1996; Kim, Yu, & Yang, 2007; Lee, Chun, Kim, Kim, & Cho, 2006; Ma et al., 2009; Moon et al., 1998; Qian et al., 2010; Wang et al., 2010; World Health Organization [WHO], 2011; Zhang et al., 2010). This finding seems to be related to the strong gender-based social prescription of smoking in these countries; smoking is a common thread in men’s social world and a prime component of men’s gender identity, whereas female smoking is strongly forbidden and women who smoke are viewed as unfit for marriage and motherhood (Kim, Son, & Nam, 2005; Ma, Chu, & Tsou, 2002). It is not unusual to see women being subjected to harsh treatment (i.e., being slapped in the face) even from a stranger when they smoke in public (Nam, 2003). Thus, men in China and Korea have one of the world’s highest smoking rates around 50–60%,

whereas their female counterparts have low smoking rates ranging from 2% to 14% (Jung-Choi, Khang, & Cho, 2012; WHO, 2011).

The present study was conducted to examine gender differences in smoking and quitting among individuals with schizophrenia in Korea. It was assumed that male and female patients would manifest differences given the significant difference found in the general population. Identifying similarities and differences in smoking-related variables between the two may have clinical implications in tobacco dependence treatment for this vulnerable group. Women in psychiatric hospitals were often restricted from smoking and forced to quit without much assistance, whereas male patients could smoke freely on unit (Bahn, 1996). Most psychiatric hospitals in Korea still allow male patients to smoke in a designated area on unit; however, female patients are often forced to quit due to discrimination against female smokers (Chung, verbal communication on January 23, 2012).

Smoking is associated with higher daily caffeine consumption (Cooper et al., 2012; Rodenburg et al., 2012). In line with their high smoking rates, individuals with serious mental illness often consume more cups of coffee than the general population (Rihs, Muller, & Baumann, 1996; Strassnig, Brar, & Ganguli, 2006). Caffeine undergoes oxidative metabolism via the liver enzyme called cytochrome protein (CYP) 1A2 that is known to be induced by the polyaromatic hydrocarbons and halogenated hydrocarbons contained in cigarette smoke (Campbell, Spielberg, & Kalow, 1987; Caubet, Elbast, Dubuc, & Brazier, 2002). Thus, smokers require more caffeine than nonsmokers to obtain the desired effects of caffeine (de Leon et al., 2003). Furthermore, it was also found that caffeine enhances the stimulating and reinforcing effects of nicotine, which in turn facilitates cigarette consumption (Adolfo, AhnAllen, & Tidey, 2008; Shoaib, Swanner, Yasar, & Goldberg, 1999; Tanda & Goldberg, 2000). In brief, smoking and caffeine facilitate consumption of each other.

In a population-based survey in Korea, male smokers were more likely to consume caffeine daily than male nonsmokers; yet, no difference was found among women (Lee, Hyun, & Kwak, 2003). It was also found that men were more likely to be daily caffeine users than women in Korea (Kim, Lim, Song, Kang, & Lee, 2009). Findings from the two studies may be related to the low smoking prevalence among women as compared to men. Given this, there would also be a significant gender difference in caffeine use among individuals with schizophrenia. Taken all, the purpose of the current study was two-fold: (a) to examine differences in smoking and caffeine use by gender among individuals with schizophrenia in Korea and (b) to identify factors associated with an intention to quit smoking among individuals with schizophrenia in Korea.

METHOD

Sample

Participants were adult psychiatric inpatients diagnosed with schizophrenia defined by the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Text Revision (DSM-IV-TR) (APA, 2000). To participate in the study, they were required to be at least 18 years old and were able to understand the purpose and procedure of the study. Patients who were acutely psychotic, manic, or demented were excluded from the study.

Procedure and Measures

This is an anonymous study on smoking and the research protocol was approved by the Institutional Review Board of Jeonbuk National University Hospital in South Korea. We purposefully elected to collect data via self-administration because female patients were less likely to disclose their smoking status if we conducted face-to-face interviews. This is part

of a larger study conducted with all psychiatric inpatients who were receiving treatment in one of seven hospitals in South Korea. Four were general hospitals with psychiatric units and three were psychiatric hospitals. In all hospitals, smoking was allowed in designated areas on unit. Research staff visited each of the seven participating hospitals and explained the purpose of the study to staff and patients on unit. Patients were provided with a research questionnaire and asked to complete and return it in an envelope provided. Research staff visited the hospitals a second time to collect the envelopes. The following variables and their respective measures were chosen from a review of previous studies (Bahn & Cho, 1996; Kim et al., 2007; Moon et al., 1998; Lee et al., 2006) on tobacco use conducted with psychiatric patients in Korea.

Demographic—Gender, age, and years of education were assessed. Due to the small number of people being married, marital status was not assessed to ensure anonymity.

Smoking behavior—Information was gathered regarding age at smoking onset, years of smoking, and number of cigarettes smoked per day on average. Those who reported having smoked at least 100 cigarettes in lifetime were classified as lifetime (ever) smokers. Among lifetime smokers, those who had smoked daily for the past 30 days was classified as current smokers and those who had quit for more than 6 months as former smokers. Current smokers were further assessed on nicotine dependence, number of previous quit attempts, experience with tobacco dependence treatment, and an intention to quit smoking.

Nicotine dependence—The Fagerström Test for Nicotine Dependence ([FTND], Heatherton, Kozlowski, Frecker, & Fagerstrom, 1991) was used. This measure consists of six items: four dichotomous and two multi-response (0–3) items. The total score, which can range from “0” to “10,” is the sum of the scores of the six items. A higher score indicates more dependence on nicotine. The FTND was translated into a Korean-version FTND, which yielded a Cronbach’s alpha of .72 with Koreans in Korea (Park et al., 2004). The Korean version had a significant correlation with age at smoking onset, indoor-house smoking, and self-efficacy in quitting in an expected direction, indicating its construct validity (Kim, Fang, DiFranza, Ziedonis, & Ma, 2012). We also used the same version in this study and its Cronbach’s alpha was .53.

Intention to quit smoking—This variable was assessed using a dichotomous single-item question “*Do you intend to quit smoking sometime in future?*”

Caffeine use—Participants were asked to indicate the mean number of cups of caffeinated coffee they consumed each day if they were daily drinkers.

Data Analysis

Data were analyzed using the SPSS version 19.0. Descriptive statistics were used to assess demographics and smoking behavior. Listwise deletion was used to handle missing data. All variables were assessed for multicollinearity, skewness, and violation of normal distribution. First, chi-square tests for categorical variables and independent-sample *t*-tests for continuous variables were performed to examine gender differences in smoking status and other key study variables. Second, stepwise logistic regression analyses were performed to identify factors associated with an intention to quit smoking. We entered variables in the following order: demographics (e.g., age and gender), smoking-related variables (e.g., age of smoking onset and nicotine dependence), and quitting-related variables (e.g., past quit attempts).

RESULTS

Among eligible patients, 580 (63.3%) participated in the study. Data from four participants were excluded due to multiple answers to questions and the final sample was 576. Mean age was 45.6 (SD = 9.9) and about two thirds (67.2%) completed at least high school. Of the total sample, 299 (51.9%) were current smokers and nine (1.6%) were former smokers. The mean age of onset of smoking was 22.3 (SD = 8.1). Current smokers had more years of education than nonsmokers ($t_{422} = 3.0, p < 0.01$). However, this relationship became insignificant when controlled for gender.

The percent of former and current smokers differed significantly by gender (see Table 1). Males were far more likely to be current smokers and smoked more cigarettes per day than females. Males were less likely to be former smokers than females. Males initiated smoking earlier than females; however, no gender difference was found in nicotine dependence. Compared to males, females were more likely to have a quit attempt, to be advised for quitting by health care professionals, and currently receive tobacco dependence treatment. More females than males intended to quit smoking sometime in the future.

More than half (51.8%) of current smokers were daily caffeine users as compared to only 1.4% of nonsmokers ($\chi^2 [1, 576] = 182.74, p < 0.001$). Females were less likely to be daily coffee drinkers ($\chi^2 [1, 576] = 23.66, p < 0.001$) and consumed fewer cups of coffee per day (see Table 1). There was a gender interaction effect in the relationship between smoking status and caffeine use. Among smokers, females were more likely than males to consume caffeine daily (74.0% vs. 47.4%; $\chi^2 [1, 576] = 23.66, p < 0.001$), whereas no difference (1.6% vs. 1.1%) was found among nonsmokers.

Results of logistic regression analyses are presented in Table 2. Years of education, number of past quit attempts, and nicotine dependence showed a significant association with an intention to quit smoking ($\chi^2 [2, 161] = 22.97, p < 0.001$). Regardless of gender, smokers with more years of education ($p < 0.05$) and higher nicotine dependence scores ($p < 0.05$) had decreased odds of intending to quit smoking, whereas those with more previous quit attempts ($p < 0.01$) had increased odds of intending to quit smoking. Although the relationship was marginally significant ($p = 0.06$), male smokers had decreased odds of intending to quit smoking as compared to female smokers.

DISCUSSION

This is the first study to examine gender differences in smoking and quitting and factors associated with an intention to quit smoking among individuals with schizophrenia in Korea. Females were less likely to smoke and smoked fewer cigarettes per day than their male counterparts and these findings are similar to those found in the general Korean population (Choi & Kim, 2008; Jung-Choi et al., 2012; Myung et al., 2012). In addition, females were more likely to be former smokers and to have previous quit attempts than their male counterparts. Although none of the seven participating hospitals forbade females from smoking on unit, they might be reluctant to smoke because of the strong taboo against smoking by women in Korean culture. For the same reason, females might be more likely to quit and receive tobacco dependence treatment than males.

Both men (73.7%) and women (21.0%) in this study were approximately 1.5 times more likely to be smokers than men (50%) and women (14%) in the general population in Korea (Jung-Choi et al., 2012). The ratio of smokers with schizophrenia to smokers in the general population is not as large as the pooled ratio 5.3 estimated from a meta-analysis of 42 studies in Western countries (de Leon & Diaz, 2005). The pooled ratio differed by gender: 7.2 for men and 3.3 for women (de Leon & Diaz, 2005), whereas we did not find such a

gender difference in the present study. This discrepancy may be related to different stages of tobacco epidemic between Korea and Western countries. Most Western countries have a steady decline in smoking rates for both men and women (Centers for Disease Control and Prevention, 2011; Dickerson et al., 2013), whereas the rates remain high at 50% for men and have been on a rise for women in Korea (Jung-Choi et al., 2012). Nevertheless, our findings may indicate an emerging gap in tobacco use between individuals with schizophrenia and the general population in Korea.

Approximately 60% of the participants in this study had no intention to quit smoking anytime in the future. This rate is slightly higher than 53% found in patients with schizophrenia by Kim et al. (2007). In contrast, only 25% of smokers in the general Korean population had no intention to quit smoking anytime in the future (Myung et al., 2012). As expected, having more previous quit attempts and lower nicotine dependence scores had increased odds of intending to quit smoking among individuals with schizophrenia. However, contrary to expectations, having more years of education had decreased odds of intending to quit smoking. No previous study exists to compare findings regarding factors associated with an intention to quit smoking among individuals with schizophrenia in Korea. Findings regarding the relationship between education level and quitting are not consistent among studies conducted with the general population in Korea; some (Myung et al., 2012) found that a higher education level was associated with an intention to quit smoking, whereas others (Kim, Ko, Yoon, Lee, & Sung, 2012) found that a higher education level was associated with a lower quit rate.

Both male and female smokers in this study were far more likely to be daily caffeine users than nonsmokers. In addition, the percent of men who consumed five or more cups of coffee daily is almost twice (6% versus 3%) as much as that in the general male population (Kim et al., 2009). This may be related to the relatively high rate of smoking among men in this study compared to men in the other study (74% vs. 49%, Kim et al., 2009). The significant association between caffeine use and smoking may support the notion that they facilitate consumption of each other (Shoaib et al., 1999; Tanda & Goldberg, 2000).

Limitations

Some limitations of the present study should be noted. The study was conducted with patients who were hospitalized and hence, the study sample may not represent the whole population of people with schizophrenia in Korea. In addition, only daily smokers were included in the studies. Thus, findings from the study may not be relevant to individuals with schizophrenia who smoke non-daily. Second, the study is a self-report survey and some, particularly females, might have underreported their current and past use of tobacco, which was found among the general Korean population (Jung-Choi et al., 2012). Third, the measure of nicotine dependence (the FTND) yielded a low reliability score. Violation of tau-equivalence (equal weights among question items) that is assumed in the measurement of Cronbach's alpha is viewed as a possible cause for the low internal reliability (Raykov, 1997). In addition, some researchers (Steingberg, Williams, Steinberg, Krejci, & Ziedonis, 2005) suggested that the FTND be not appropriate as a measure of nicotine dependence for individuals with schizophrenia. The FTND is an indirect measure of nicotine dependence by assessing its impact on smoking patterns (i.e., time to first cigarette after waking). Future studies should identify a measure that fits better individuals with schizophrenia, using the DSM-IV-TR (APA, 2000) as a criterion measure. Of note, Hooked on Nicotine Checklist (DiFranza et al., 2002; Wellman et al., 2006) is one of direct measures of nicotine dependence by assessing the symptoms that motivate smoking.

Nursing Implications

The striking gender differences found in this study may underscore the importance of sociocultural understanding of smoking behavior in addition to the biological explanation of high nicotine dependence among individuals with schizophrenia. The study also sheds light on emerging smoking-related health disparity in individuals with schizophrenia in Korea. Unlike the substantial decline in smoking prevalence found among men in the general population (Jung-Choi et al., 2012; WHO, 2011), it remains high among men with schizophrenia. Furthermore, smoking uptake appears to be higher among women with schizophrenia than among women in the general population.

Nurses in Korea should play an active role in tobacco control for patients with schizophrenia by providing cessation counseling and educating the facilitating effect of caffeine use on cigarette consumption, while paying heed to gender differences found in this study. Recent studies (e.g., Bernard et al., 2013; Gelkopf et al., 2012) conducted in Western countries indicated that nursing interventions are feasible and effective for smoking reduction among patients with schizophrenia. Smoking reduction often increases the probability of future cessation. In addition, psychiatric nurses should keep in mind that smoking interacts with some antipsychotic medications such as clozapine and olanzapine, and patients who quit smoking or substantially have reduced the amount of smoking are more likely to experience side effects of any of these medications if they continue to take the same dose of the medication as that before the change (Carrillo et al., 2003; Haslemo, Eikeseth, Tanum, Molden, & Refsum, 2006; Lowe & Ackman, 2010).

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Table 1

Key study variables by gender

Variable	Male (N = 338)	Female (N = 238)	Test	p-value
	Mean \pm SD/f (%)	Mean \pm SD/f (%)	t-test χ^2	
Age	45.7 \pm 10.0	45.5 \pm 9.7	0.30	$p = .77$
Years of schooling	13.6 \pm 4.9	12.4 \pm 5.3	3.00	$p < 0.01$
Former smoker	3 (1.2%)	6 (10.7%)	14.6	$p < 0.01$
Current smokers	249 (73.7%)	50 (21.0%)	155.1	$p < 0.001$
Age at smoking onset	21.3 \pm 7.7	26.9 \pm 8.4	-4.82	$p < 0.001$
Years of smoking	23.2 \pm 10.5	15.7 \pm 9.2	4.78	$p < 0.001$
Number of cigarettes smoked per day	14.9 \pm 9.3	10.6 \pm 10.0	2.56	$p < 0.05$
Nicotine Dependence (FTND scores)	5.3 \pm 2.2	5.5 \pm 2.0	0.27	$p = 0.79$
Number of past quit attempts	2.7 \pm 2.1	3.6 \pm 2.5	-3.01	$p < 0.01$
Quit advice from health professionals				$p < 0.05$
Yes	77 (31.0%)	26 (52.0%)	5.8	
No	172 (69.0%)	24 (48.0%)		
Current tobacco dependence treatment				$p < 0.01$
Yes	30 (18.2%)	17 (41.5%)	10.1	
No	135 (81.8%)	24 (58.5%)		
Intention to quit smoking				$p < 0.05$
Yes	56 (36.1%)	21 (55.3%)	4.7	
No	99 (63.1%)	17 (44.7%)		
Number of coffee cups per day				$p < 0.001$
0	220 (65.1%)	198 (83.2%)	24.9	
1-4	97 (28.7%)	37 (15.5%)		
5	21 (6.2%)	3 (1.3%)		

Note. Sample size varied from 159 (daily coffee drinkers) to 576 (the total sample), SD = standard deviation, f = frequency and FTND = the Fagerström Test for Nicotine Dependence

Table 2

Regression of intention to quit smoking on predictors (N = 161)

Variable	B	SE	Wald	DF	p-value	Odds Ratio (95% CI)
Gender (Ref. Female)	−0.899	0.481	3.496	1	0.062	0.407 (0.159–1.044)
Years of education	−0.108	0.045	5.722	1	0.017	0.897 (0.812–0.981)
Number of quit attempts	0.295	0.103	8.150	1	0.004	1.343 (1.097–1.645)
Nicotine dependence	−0.212	0.093	5.247	1	0.022	0.809 (0.675–0.970)

Note. B = unstandardized coefficient, SE = standard error, DF = degree of freedom, and CI = confidence interval