RESEARCH COMMUNICATION

Psychosocial Factors and Health Behavior among Korean Adults: A Cross-sectional Study

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Abstract

Objective: This study was an attempt to identify associations between health behavior, such as smoking, alcohol consumption, healthy diet, and physical activity, and psychosocial factors. Methods: This cross-sectional study was conducted among 1,500 participants aged between 30 and 69 years, selected from a population-based database in October 2009 through multiple-stratified random sampling. Information was collected about the participants' smoking and drinking habits, dietary behavior, level of physical activity, stress, coping strategies, impulsiveness, personality, social support, sense of coherence, self-efficacy, health communication, and sociodemographics. Results: Agreeableness, as a personality trait, was negatively associated with smoking and a healthy diet, while extraversion was positively associated with drinking. The tendency to consume a healthy diet decreased in individuals with perceived higher stress, whereas it increased in individuals who had access to greater social support. Self-efficacy was found to be a strong predictor of all health behaviors. Provider-patient communication and physical environment were important factors in promoting positive healthy behavior, such as consumption of a healthy diet and taking regular exercise. Conclusions: Psychosocial factors influence individuals' smoking and drinking habits, dietary intake, and exercise patterns.

Key words: Smoking - alcohol consumption - healthy diet - physical activity - stress - personality - social support

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Introduction

Numerous media reports have been released across the world to alert people on the risk factors for diseases. Health professionals and related authorities have repeatedly emphasized the need for improvement in risk factors centered on the daily lifestyles of individuals, especially for the prevention of cancer and cardiovascular diseases. To achieve this end, health guidelines have been developed, and a number of health campaigns have been launched. However, it is well known that people at large do not follow these prescriptive guidelines, despite being aware of the consequences of noncompliance (UICC, 2009). Researchers have attempted to explain this confounding phenomenon by attributing to external factors. They reason that a variety of psychological, social, and environmental factors, even though regarded as distal determinants of health behaviors, contribute as much to the realization of health behaviors as proximal behavioral determinants such as knowledge, attitude, and intention (Dahlgren et al.,1991).

The importance of social and environmental influences, both direct and indirect, in shaping health behavior has been widely acknowledged after the release of the Lalonde report in 1974. However, while focusing on social and environmental factors, most studies in the field of healthcare continue to overemphasize individual responsibility and fail to recognize constraints on individual behavior, which is known as "victim-blaming." Psychosocial factors can be seen as mediating the effects of social structural factors on individual health outcomes; these factors are conditioned and modified by the social structures and contexts from which stem (Martikainen et al., 2002). A central constituent of a psychosocial explanation of health is that macro- and meso- level social processes generate perceptions and psychological processes at the individual level (Martikainen et al., 2002). Thus, an understanding of these psychosocial factors can help in identifying educational, behavioral, and environmental indicators for improving health. Psychosocial determinants of health include education, employment, personality, stress, adopting of health-promoting behaviors, and development of a social support network (National Health Strategy, 1992; WHO regional office for Europe, 2003).

Psychosocial factors are thought to affect human health through two general pathways (Adler et al., 1994). They are capable of influencing the psychophysiological

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responses that are implied in pathology and host vulnerability, reducing resistance to pathogens or stimulating disease mechanisms. These factors may also alter patterns of health-related behaviors such as smoking, alcohol consumption, dietary intake, and physical activity that directly are linked to health risks. A number of studies have reported on associations between personality and behaviors such as smoking (Hooten et al., 2005), alcohol consumption (Robins et al., 2001), and healthy diet (de Bruijn et al., 2005). Correlations have also been found between stress and smoking (Green et al., 1990) and stress and healthy diet (Steptoe, 1991). Researchers have investigated the associations between social support and the following health behaviors: smoking (Wagner et al., 2004; Lawhon et al., 2009), alcohol consumption (Steptoe et al., 1996; Hagihara et al., 2003), healthy diet (Pollard et al., 1995), and physical activity (Spanier et al, 2001; Anderson et al., 2006).

However, most of these studies have focused exclusively on one particular behavior. Given that health-related behaviors occur in clusters—individuals engaging in any one negative health behavior are more susceptible to others (Altekruse et al., 1995; Breslow et al., 2006)—an understanding of the psychosocial determinants of these health behavior patterns could lead to better models to explain the development of disease and better interventions to minimize health problems. Hence, the aim of the present study is to determine the relationships between health behaviors, for example, smoking, alcohol consumption, healthy diet, and physical activity, and psychosocial factors.

Materials and Methods

Design and Sample

The participants for this cross-sectional study were chosen from a population-based database through multiple-stratified random sampling. A total of 1,500 participants aged between 30 and 69 years with no history of cancer were engaged in face-to-face interviews by investigators from a professional research agency in October 2009. Information was collected about the participants' smoking and drinking habits, dietary behaviors, exercise patterns, stress levels, coping strategies, personality, impulsiveness, social support, sense of coherence, self-efficacy, health communication, and sociodemographics. The study was approved by the Institute of Review Board at the Korean National Cancer Center, and informed written consent was obtained from all study participants.

Measures

Participants who admitted to smoking during their face-to-face interviews were classified as "smokers." Those who had never smoked or had quit smoking were classified as "nonsmokers." To determine drinking habits, participants were asked to respond with a "yes" or "no" to the following question: "do you consume less than two drinks per day of any alcoholic beverage?" To assess dietary behavior, participants were asked to indicate whether they consumed a diverse, well-balanced diet that included sufficient quantities of fruits and vegetables. Participants who exercised more than five times a week and for 30 minutes a day were considered as regular exercisers.

Stress was assessed using the psychosocial well-being index—short form (PWI-SF), developed by Chang (2000) (Chang, 2000). The PWI-SF consists of 18 items, each scored on a four-point Likert scale ranging from "strongly disagree" (0) to "strongly agree" (3). The total score can range from 0 to 54. Respondents with scores of less than 9, 9 to 27, and more than 27 were classified as low, moderate, and high stress groups, respectively. The Cronbach alpha coefficient was 0.87.

Respondents' coping strategies were assessed using the Coping Strategy Indicator (CSI) developed by Amirkhan (Amirkhan, 1990). The CSI is a self-report measure containing 33 items that assess three coping strategies: social support seeking, problem solving, and avoidance. Each coping strategy is rated on three-point Likert scale ranging from "never" (1) to "much" (3), and the total score on the CSI can range from 33 to 99. The Cronbach alpha coefficients were 0.84, 0.86, and 0.76 for social support seeking, problem solving, and avoidance, respectively.

Impulsiveness was assessed using the Korean version of the Barratt Impulsiveness Scale, adapted by Chung (Chung et al., 1997). This instrument consists of 23 items rated on a four-point Likert scale ranging from "never" (1) to "always" (4). The total score can range from 23 to 92. The Cronbach alpha coefficient for this measure was 0.79.

Personality was assessed using the Ten-Item Personality Inventory developed by Gosling (Gosling et al., 2003). This self-reported questionnaire consists of 10 statements and is composed of two descriptors that assess the five basic dimensions of personality: extraversion, agreeableness, conscientiousness, emotional stability, and openness to experience. Each item is rated on a seven-point Likert scale ranging from "strongly disagree" (1) to "strongly agree" (7).

Social support was assessed using the Multidimensional Scale of Perceived Social Support (MSPSS), developed by Zimet et al (1988) (Zimet et al., 1988). The MSPSS consists of 12 perceived social support items and 3 subscales that assess support from "family," "friends," and "significant others." Participants were asked to rate each item on a five-point Likert scale ranging from "strongly disagree" (1) to "strongly agree" (5), and the total score could range from 12 to 60. The Cronbach alpha coefficient for this scale was 0.92.

Sense of coherence was assessed using the Sense of Coherence Scale (SOC-13) developed by Antonovsky (1993) (Antonovsky, 1993). This tool also uses a seven-point Likert scale ranging from "never" (1) to "very often" (7). The total score on the tool can range from 13

to 91. The Cronbach alpha coefficient for this scale was 0.77.

Self-efficacy was assessed by asking participants to indicate if they were capable of avoiding smoking or drinking less than two drinks at a time or consuming a diverse, balanced diet with fruits and vegetables, or exercising more than five times a week and 30 minutes a day. Each item was rated on a seven-point Likert scale ranging from "not at all confident" (1) to "extremely confident" (7).

To assess the status of health communication, participants were asked to indicate how often they discussed matters related to cancer prevention with their neighbors, colleagues, health professionals, and family members and whether they obtained prevention-related information from television, newspapers, magazines, and the internet. Each item was rated on a five-point Likert scale ranging from "never" (1) to "much" (5).

To determine the influence of environmental factors on exercise, participants were asked if they had access to exercise facilities near their homes, that is, aerobics classes, basketball courts, riverside promenades, biking lanes, golf ranges, fitness clubs, playgrounds, parks, gymnasiums, ice rinks, swimming pools, mountain trails, and tennis courts.

Analysis

For the purpose of analysis, coping strategy, impulsiveness, personality, social support, sense of coherence, self-efficacy, and health communication were divided into three groups created based on tertile scores. The chi-square test was used to assess the relationships between demographics, stress, coping strategy, impulsiveness, personality, social support, sense of coherence, self-efficacy, and health communication and each of the health behaviors: smoking, drinking, healthy diet, and regular exercise. Logistic regression was subsequently performed, with each of the health behaviors acting as the dependent variables and all individual characteristics as independent variables. Variables significant at $p < 0.1$ in the bivariate analysis were used to determine multivariate relationships between a set of background characteristics, including stress, coping strategy, impulsiveness, personality, social support, knowledge, sense of coherence, self-efficacy, and health communication, and health behavior. Data were analyzed using SPSS 15.0 software.

Results

Table 1 lists the demographic and psychosociological characteristics of the study population. The mean age of the participants was 46.5 years, 87.0% had a partner, and 74.3% were employed. Nearly one third of the participants had completed university-level education, whereas 19.5% had not completed high school. The prevalence rates of smoking, drinking, healthy diet, and regular exercise were 24.4%, 34.3%, 63.1%, and 44.2%,

Table 1. Demographic and Psychosocial Characteristics of the Study Population (N = 1,500)

Variables		No. (%)/Mean (S.D.)
Age, yr	30-39	465 (31.0)
	40-49	477 (31.8)
	50-59	339 (22.6)
	60-69	219 (14.6)
Marital status	Single	139 (9.3)
	Married	1,305 (87.0)
	Divorced, separated	16 (1.0)
	Widowed	40 (2.7)
Education	No formal education	16 (1.0)
	Elementary school	114 (7.6)
	Middle school	164 (10.9)
	High school	731 (48.7)
	College	431 (28.7)
	Graduate school	37 (2.5)
Annual household income, $	0-20,000	299 (19.9)
	20,001-30,000	393 (26.2)
	30,001-40,000	446 (29.8)
	40,001-50,000	199 (13.8)
	50,001-70,000	106 (7.1)
	>70,001	37 (2.5)
Religious affiliation	None	630 (42.0)
	Buddhist	373 (24.9)
	Protestant	371 (24.7)
	Catholic	107 (7.1)
Type of job	None	56 (3.7)
	Outdoor (agriculture, etc)	42 (2.8)
	Self-employed small business	445 (29.8)
	Sales & marketing	190 (12.7)
	Engineering, technical	86 (5.7)
	Building, construction, manual	56 (3.7)
	Office & administrative	263 (17.5)
	Management & executive	8 (0.5)
	Professional	24 (1.6)
	Housewife	331 (22.0)
Psychosocial stress	Lower	113 (7.5)
	Middle	1,144 (76.2)
	Upper	243 (16.2)
Coping strategy	Seeking social support	22 (3.9)
	Problem solving	24 (4.1)
	Avoidance	18 (3.8)
Impulsiveness	Attention	14 (1.9)
	Motor	14 (3.7)
	Nonplanning	17 (3.3)
Personality	Extraversion	8.3 (2.3)
	Agreeableness	9.4 (1.9)
	Conscientiousness	9.9 (2.0)
	Emotional stability	9.2 (1.9)
	Openness to experience	8.3 (1.8)
Social support	Significant others	14.7 (2.9)
	Friends	14.3 (2.7)
	Family	15.3 (2.5)
Sense of coherence		58.8 (9.0)
Self-efficacy	Quitting smoke	4.2 (2.1)
	Limiting alcohol consumption	4.8 (2.1)
	Healthy diet	4.8 (1.4)
	Regular exercise	4.3 (1.8)
Health communication	With general people	3.0 (0.9)
	With health professionals	2.7 (1.0)
	With family members	3.2 (0.9)
	Information from television	3.2 (0.9)
	From newspapers or magazines	2.9 (1.0)
	Information from the internet	2.6 (1.1)

Table 2. Results of Multivariate Analysis Using Proportional Odds Model for Factors Associated with Non-smoking*

Variables		Odds ratio for nonsmoking	Confidence interval
Age (yr)	30-39	1	
	40-49	1.55	1.00-2.42
	50-59	1.59	0.96-2.62
	60-69	3.05	1.68-5.52
Gender	Men	1	
	Women	24.74	14.9-41.0
Marital status	Never married	1	
	Married	1.46	0.84-2.53
	Divorced/seperated	0.43	0.08-2.23
	Widowed	0.27	0.07-1.07
Religion	None	1	
	Buddhist	0.91	0.60-1.39
	Protestant	1.82	1.16-2.83
	Catholic	0.81	0.39-1.69
Personality			
Agreeableness	Lower	1	
	Middle	1.41	0.96-2.09
	Upper	1.95	1.26-3.04
Self-efficacy	Lower	1	
	Middle	4.12	2.85-5.97
	Upper	35.81	19.8-64.9

*Data were adjusted for age, gender, marital status, education, religion, job, impulsiveness-motor, impulsiveness-non-planning, agreeableness, social support-significant others, self-efficacy, health communication-with neighbors, health communication-with health professionals, health communication-with family, and health information-from television.

Table 3. Results of multivariate analysis using proportional odds model for factors associated with limited alcohol consumption*

Variables		Odds ratio for alcohol	Confidence interval
Age (yr)	30-39	1	
	40-49	1.23	0.87-1.74
	50-59	1.23	0.84-1.80
	60-69	1.94	1.22-3.08
Gender	Men	1	
	Women	4.03	3.01-5.38
Religion	None	1	
	Buddhist	1.03	0.73-1.46
	Protestant	2.49	1.72-3.62
	Catholic	1.83	1.03-3.25
Personality			
Extraversion	Lower	1	
	Middle	0.73	0.52-1.02
	Upper	0.54	0.38-0.78
Self-efficacy	Lower	1	
	Middle	6.46	4.70-8.89
	Upper	31.09	19.84-48.74

*Data were adjusted for age, gender, education, income, coping strategy-seeking social support, impulsiveness-non-planning, extraversion, openness, social support-significant others, social support-family, self-efficacy, health communication-with neighbors, health communication-with health professionals, and health communication-with family.

Table 4. Results of Multivariate Analysis Using Proportional Odds Model for Factors Associated with Healthy Diet*

Variables	Odds ratio for healthy diet	Confidence interval
Age (yr)		
30-39	1	
40-49	0.93	0.68-1.27
50-59	1.57	1.09-2.26
60-69	1.88	1.20-2.96
Religion		
None	1	
Buddhist	1.27	0.93-1.75
Protestant	1.64	1.19-2.26
Catholic	1.16	0.70-1.93
Annual household income, $		
0-20,000	1	
20,001-30,000	0.99	0.68-1.45
30,001-40,000	1.36	0.93-2.00
40,001-50,000	1.84	1.16-2.93
50,001-70,000	2.07	1.14-3.77
>70,001	4.09	1.54-10.82
Type of job		
None	1	
Outdoor	0.99	0.38-2.59
Self-employed small business	1.3	0.65-2.62
Sales & marketing	0.82	0.39-1.73
Enginerring, technical, s	1.2	0.52-2.74
Building, construction & manual	3.62	1.40-9.38
Office & administrative	1.57	0.75-3.27
Management & executive	1.05	0.20-5.56
Professional	0.93	0.28-3.07
Housewife	1.69	0.83-3.42
Psychosocial stress		
Lower	1	
Middle	0.82	0.59-1.13
Upper	0.63	0.45-0.88
Personality Agreeableness		
Lower	1	
Middle	0.64	0.47-0.87
Upper	0.54	0.39-0.75
Social support		
Lower	1	
Middle	1.86	1.34-2.57
Upper	1.52	1.12-2.06

*Data were adjusted for age, gender, marital status, education, income, religion, job, stress, coping strategy-seeking social support, coping strategy-problem solving, impulsiveness-non-planning, extraversion, agreeableness, social support-significant others, social support-family, social support-friends, sense of coherence, self-efficacy, health communication-with neighbors, health communication-with health professionals, health communication-with family, health information-from television, and health information

respectively. Approximately 16.2% of the population reported experiencing high levels of stress. The most commonly used coping method was problem solving and the least used coping strategy was avoidance. The most prominent personality trait was conscientiousness, while the least prominent traits were extraversion and openness.

Tables 2 through 5 show the odds ratios (OR) and

Table 5. Results of Multivariate Analysis using Proportional Odds model for factors associated with regular exercise*

Variables	Odds ratio for regular exercise	Confidence interval
Age (yr)		
30-39	1	
40-49	1.04	0.70-1.56
50-59	1.25	0.79-1.98
60-69	2.38	1.38-4.10
Type of job		
None	1	
Outdoor	0.88	0.02-0.32
Self-employed small business	0.28	0.10-0.77
Sales & marketing	0.25	0.09-0.73
Enginerring, technical,	0.08	0.02-0.25
Building, construction & manual	0.14	0.04-0.50
Office & administrative	0.28	0.10-0.79
Management & executive	0.36	0.03-4.09
Professional	0.41	0.09-1.94
Housewife	0.3	0.11-0.82
Self-efficacy		
Lower	1	
Middle	5.19	3.37-7.99
Upper	39.23	24.41-63.02
Communicating about prevention with health professionals		
Lower	1	
Middle	1.85	1.24-2.69
Upper	1.71	1.14-2.57
Environment for exercise Mountain trails near my house		
Do not exist	1	
Exist	1.6	1.12-2.28
Self-efficacy		
Lower	1	
Middle	3.71	2.68-5.12
Upper	8.37	6.15-11.39
Communicating about cancer prevention with health professionals		
Lower	1	
Middle	1.33	0.99-1.78
Upper	1.84	1.34-2.54

*Data were adjusted for age, stress, coping strategy-seeking social support, coping strategy-avoiding, impulsiveness-attention, impulsiveness-non-planning, extraversion, social support-friends, sense of coherence, exercise environment-basketball court, golf range, ice rink, swimming pool, mountain trail, health communication-with neighbors, health communication-with health professionals, health communication-with family, health information-from television, and health information-from newspaper.

95% confidence intervals (CI) for the logistic regression models after adjusting for all the covariates that were significant at $p < 0.1$ in the bivariate analysis. Older age was generally associated with greater likelihood of engaging in healthy behaviors, that is, consuming healthy diet and exercising regularly. Fewer women engaged in smoking and drinking than men. Compared to members of other religions, fewer protestants smoked and drank; they also tended to consume a more healthy diet. Higher income was associated with greater consumption of vegetables and fruits. Having a job, even if it involved being a housewife, was usually associated with less exercise. With regard to personality traits, respondents with greater agreeableness were less likely than other respondents to smoke and consume a healthy diet. High extraversion was associated with greater frequency of drinking. High self-efficacy exhibited a positive correlation with all the four health behaviors examined in this study. Lower stress levels and high social support were the two psychosocial characteristics associated with a healthy diet. Participants who obtained information on cancer prevention information from health professionals were more inclined to consume a healthy diet and exercise regularly. Individuals whose houses were located close to mountain trails were more likely to exercise regularly.

Discussion

Our findings reveal significant associations between psychosocial factors and health behaviors, such as smoking, drinking, adopting a healthy diet, and regular exercise. We found that agreeableness, as a personality trait, was negatively associated with smoking and a healthy diet whereas extraversion was positively related to drinking. Higher levels of stress were associated with a decline in the quality of diet. In contrast, individuals with greater social support tended to consume a healthy diet. Self-efficacy was a strong predictor of all health behaviors. Provider–patient communication and physical environment were found to influence health-promoting behaviors, such as healthy diet and regular exercise.

Health behaviors varied according to sociodemographic factors. Smoking and drinking rates were higher among men than among women and declined with increasing age. Lower prevalence of smoking and drinking among older individuals and women has been reported in earlier studies (Helasoja et al., 2007; Silveira et al, 2007; Marinho et al., 2008). Older respondents were more likely than younger respondents to follow a healthy diet and exercise regularly. Ishii (2009) reported that younger ages were significantly associated with strong perceptions of discomfort, lack of motivation, and lack of time for exercising (Ishii et al., 2009). Our findings showed that religion was linked to smoking, healthy diet, and drinking, which is consistent with previous studies (Gilmore et al., 2001; Williams et al., 2001; Marinho et al., 2008). People reporting greater participation in religious activities were less likely to be smokers; for instance, Protestants typically encouraged weekly participation in religious activities and advocated abstinence from many substances, including tobacco and alcohol. Analysis of the responses showed that individuals with jobs did not engage in regular exercise activities. Lack of time has been reported to be a strong perceived barrier for exercise, and this trend is particularly significant among employed individuals (Welch et al., 2009).

We noted a statistically significant inverse relationship between agreeableness and smoking: individuals who are

less friendly, trusting, generous, and tolerant are more often in the "smokers" category. This observation is in line with the finding that people with low agreeableness have greater difficulty maintaining abstinence than those with a higher level of agreeableness (Hooten et al., 2005). Surprisingly, in this study, higher agreeableness predicted a poor or unhealthy diet pattern, which is inconsistent with previous findings that more agreeable individuals have a more positive approach toward health diets and vegetable consumption (de Bruijn et al., 2005; Thornton et al., 2006). This discrepancy may be attributed to the spontaneity and independence of the individuals interviewed in this study. Previous studies focused only on adolescents who are mainly influenced by their parents. Dietary habits of adolescents, that is, consumption of fruit and vegetables, are often governed by the eating rules within the family. As agreeableness encompasses traits such as compliance, it can be said that more agreeable adolescents are more likely to obey these rules and thus, follow a healthy diet. Extending this hypothesis, it can also be argued that individuals who are agreeable are more likely to attend social events and gatherings, which force them to follow unhealthy eating practices. Extraversion, as a personality trait, exhibited positive association with alcohol consumption, which is in line with previous research findings (Robins et al., 2001). Individuals who are energetic, talkative, and sociable are more likely to engage in interactions over a few drinks.

High perceived social support was associated with greater likelihood to consume a healthy diet. Several studies have examined the association between social support and diet. A qualitative study revealed that significant others were primary sources of emotional, instrumental, and diet-related informational support for pregnant women (Thornton et al., 2006). Another study suggested that social support moderates the influence of stress on eating behavior. Participants who experienced stress and had a low level of social support showed significantly greater levels of total energy and fat intake (Pollard et al., 1995). Interpersonal exchanges within a social network help and support individuals in adopting preventive health behaviors. Several studies have shown that social support is associated with health behaviors such as smoking cessation (Wagner et al., 2004; Lawhon et al., 2009), cessation of alcohol consumption (Hagihara et al., 2003; Steptoe et al., 1996), physical activity (Anderson et al., 2006; Spanier et al., 2001), and cancer screening (Seow et al., 2000; Katapodi et al., 2002), which have not been corroborated by this study. These studies suggest that people with a high level of social support are more likely to quit risky health behaviors and engage in health-promoting behaviors. However, some research reports indicate that social support is not associated with health status or behaviors (Schaefer et al., 1981; Steptoe et al., 1996; MeMahon et al., 2000). For example, researchers studying the role of social support among patients in a primary care medical practice found that social support was a poor predictor of behavioral change (Kelly et al., 1991).

Stress influences health not only through direct psychophysiological processes but also by modifying behaviors that affect health, such as smoking, alcohol consumption, physical activity, or food choices (Steptoe, 1991). High stress was associated with increased smoking and alcohol consumption, less frequent exercise, and a high fat diet (Ng et al., 2003; Harling et al., 2009; Fox et al., 2010). In this study, we found a negative association only between dietary habits and perceived stress, consistent with previous findings (Oliver et al., 1999). Stress appears to alter overall food intake and eating patterns and leads to either undereating or overeating, which may be influenced by stressor severity (Grunberg et al., 1992). When an acute stress is experienced, there is an instant physiologic response, which results in the suppression of appetite (Charmandari et al., 2005). For many, the typical response to chronic stressful situations is not to avoid food but to seek and consume energy-rich foods, which leads to obesity (Laitinen et al., 2002; Ng et al., 2003).

Self-efficacy was associated with all the health behaviors. Self-efficacy is known to be an important variable in health care research (Bandura, 2004). Individuals with belief in their ability to exert control over a behavior showed a stronger tendency to avoid smoking, drink less, consume a healthy diet, and exercise regularly. Research has shown that there is a statistically significant positive relationship between self-efficacy and health behaviors, including smoking cessation (Leung et al., 2008), reduction in alcohol consumption (Oei et al., 2007), fruit and vegetable intake (Anderson et al., 2007), and physical activity (Morris et al., 2008; Dutton et al., 2009).

Individuals who communicated with health professionals about cancer prevention were more likely to consume a healthy diet and exercise regularly. Interpersonal communication such as between physicians and patients is one of the key sources of social influence, a process critical to inducing change in health behavior. Good communication is often associated with improved physical health, more effective chronic disease management, and better health-related behavior long after the encounter (Arora, 2003; Politi et al., 2008; Carcaise-Edinboro et al., 2008; Bundesmann et al., 2011). Physician–patient communication can affect motivational and cognitive processes, and these processes might enhance the patient's decision-making and problem-solving skill for adopting a healthier lifestyle.

Individuals living near mountain trails were more likely to exercise regularly. Previous studies have indicated that a facility-rich environment could possibly encourage physical activity (Gordon-Larsen et al., 2006, Kerr et al., 2006; Rundle et al., 2007). Exercise facilities serve as visual stimuli that could cue exercise behavior. Facilities close to one's home will be seen often and may serve as repeated reminders to exercise. Facilities

located close to one's home also reduce some of the barriers associated with exercise. Individuals frequently cite perceived inconvenience and travel problems as reasons for dropping out of exercise programs (Andrew et al., 1981). Thus, physical proximity may reduce the psychological and physical barriers to exercise.

Some of the limitations of this study are described in this section. First, it is difficult to demonstrate causality based on the cross-sectional data in this study. Therefore, causal associations should be confirmed by additional longitudinal investigations. Second, the outcomes measured in this study were limited to self-reported perceptions of healthy behaviors. Smoking, drinking, and regular exercise status were measured by self-reporting and actual food intake was not measured. Diet variables were determined through a single question on the respondent's intake of a diverse, balanced diet with sufficient amounts of fruits and vegetables. Future studies should assess the actual frequency and volume of the consumption of fruits and vegetables. However, despite these limitations, we have identified a comprehensive set of psychosocial factors that affect the health behaviors of the Korean public: smoking, drinking, consumption of a healthy diet, and regular exercise. These results will pave the way for future efforts aimed at minimizing the barriers faced by the Korean public in acquiring healthy behaviors.

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