



Korean Adolescents' Health Behavior and Psychological Status according to Their Mother's Nationality

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Objectives: This study was conducted to compare adolescents' health behaviors and psychological status according to whether or not their mother was born in Korea.

Methods: This secondary analysis used nationally representative data from the 2015 Korean Youth Risk Behavior Web-based Survey. The self-administered questionnaire included computer measured socio-demographic variables, 15 health behaviors, and psychological status. Data from 65,426 middle school and high school students were analyzed. Multiple logistic regression, adjusting for socio-demographic variables, was used to analyze differences in health behaviors and psychological status between adolescents with a foreign-born mother and those with a Korean mother.

Results: Adolescents who have foreign-born mothers had a lower level of current drinking and subjective happiness, but a higher stress level.

Conclusion: The stress levels of the adolescents with foreign-born mothers could be affected by their multicultural background. It is necessary to analyze stress-influencing factors of multicultural adolescents by comparing them to adolescents from Korean parents. Additionally, our society should pay more attention to the mental health of multicultural adolescents. Schools should also make various efforts to protect multicultural adolescents by adopting mental health management programs led by school nurses and counselors.

Key Words: adolescent, health behavior, drinking, ethnic groups, mothers

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INTRODUCTION

Recently, Korean society has experienced a rapid transition from a racially homogeneous nation to a multicultural society. Despite the continuous decline of its total population, foreign-born individuals accounted for 2.8% of the Korean population in 2013, which increased to 3.4% in 2015, and the percentage continues rising yearly [1,2]. In particular, the number of married immigrants and married-naturalized citizens has been growing steadily, reaching 281,295 in 2013 and 305,446 in 2015. Interestingly, 83.1% of these immigrants are women [1,2] and, accordingly, most multicultural families in Korea have foreign-born women. Consequently, the number of children in multicultural families is also increasing every year. While the number of total students is decreasing along with population decline, the number of adolescent secondary school students from multicultural families increased to 19,509 in 2014, 1.2% greater than that in the previous year [3].



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Adolescence is a very important period in the stages of growth and development. Adolescents experience both rapid physical growth and various changes in their psychological and emotional development [4]. Furthermore, as the developmental task of identity building takes place in this period, adolescents acquire health attitudes that may reinforce or threaten their health through this stage, thereby laying the foundation for their health in adulthood under the influence of health concepts from parents, friends, and society [4].

Scientific interest in multicultural families has thus far focused on international marriage among immigrant women but, recently, the increase in the number of students from multicultural families is drawing researchers' attention to multicultural family adolescents. It has been reported that stress, sleeping hours, and physical activities affect the subjective health status of adolescents in multicultural families [5]. Furthermore, there have been reports on relationships among subjective health status, subjective happiness [6], and suicide ideation [7,8] in adolescents from multicultural families. Because these studies were limited to adolescents in multicultural families, it is hard to compare these findings with adolescents in Korean parent families where both parents were born in Korea.

According to an international study on adolescents from multicultural or immigrant families, smoking is more frequent among adolescents from immigrant families in non-European countries than it is among those in European countries [9]. Further, the frequency of obesity was found to be higher in adolescents of Hispanic immigrant families as compared to American adolescents [10], and the recommended dietary intake rate is lower in adolescents from immigrant families than it is in Spanish adolescents [11]. A study [12] found that variables correlated with acute infection differed between adolescents with immigrant parents and adolescents with a non-immigrant background. These studies suggest that adolescents with multicultural or immigrant families may differ in health behavior from adolescents in other families.

As the number of multicultural families is increasing and adolescents from these families are occupying a larger part of Korean society [2], research from diverse perspectives should be conducted to support their growth as healthy members of Korean society. Recently, a few studies [13,14] have investigated adolescents' health risk behaviors such as drinking and smoking between multicultural and Korean parent families. However, little is known about general health behaviors in adolescents with multicultural families compared with adolescents in Korean parent families.

Thus, using data from the population-based 2015 Korea Youth Risk Behavior Web-based Survey (KYRBWS), this study sought

to analyze differences in the comprehensive health behaviors and psychological status between multicultural and Korean parent families' adolescents. The outcomes of this study are expected to provide basic information for describing the health behavior and psychological status of adolescents from multicultural families.

MATERIALS AND METHODS

1. Data sources and study population

This is a secondary analysis using nationally representative data from the 2015 KYRBWS. The KYRBWS is a government-approved statistical survey (approval No. 11758). The KYRBWS, targeting middle and high school students, has been conducted annually since 2005 jointly by the Ministry of Education, Ministry of Health and Welfare, and Korea Centers for Disease Control and Prevention (KCDC) to examine the status and trends of Korean adolescents' health behaviors.

This study was a cross-sectional study to compare adolescents' health behaviors in multicultural families with Korean parent families. This survey was carried out from June to July 2015 using an anonymous, self-administered questionnaire on a computer. Eight hundred sample schools (400 middle schools, 400 high schools) were selected considering region (17 cities or states), city size (large cities, small cities, and counties), and school type (middle school, general high school, and technical high school). Among the selected schools, one class was randomly chosen from each grade and all students in the selected classes participated in the survey. The total number of respondents was 68,043. The survey consists of 125 questions concerning 14 areas, including smoking, drinking, physical activity, dietary habits, obesity and weight control, and mental health.

Teachers at the selected schools supported the survey. They led the sampled students to the computer room, seated the students randomly, and assigned one computer to each student. The teachers gave each student a copy of the survey guidelines and explained why the survey was needed and how to participate (using a video clip or a PowerPoint presentation). Each student was assigned a unique number and entered the number on his/her survey guidelines to sign in to the survey web page. The survey took 45 to 50 minutes. After finishing the survey, souvenirs were offered to the students.

Of the 68,043 responses, 2,617 responses indicating that they had no mother were excluded from the analysis. The adolescents were classified into two groups: those whose parents were born in South Korea (Korean parent family) and those whose father was born in South Korea, but whose mothers were not born in South Korea (multicultural family).

2. Measurements

Sociodemographic variables included sex, age, mother's nationality, type of school, father's education level, mother's education level, academic achievement, and socio-economic status. The types of schools were middle school, general high school, and technical high school. Parents' education was classified into four categories: middle school or less, high school, university or more, and not known. Academic achievement and socio-economic status were measured on a 5-point scale (high, middle high, middle, middle low, low).

Fifteen variables in terms of health behaviors and psychological status were assessed: current smoking, current drinking, sexual experience, sedentary life, physical activity, the number of times breakfast was eaten in last seven days, number of times teeth are brushed in a day, hand washing, wearing seatbelts, subjective health status, subjective happiness, body mass index (BMI), perceived stress level, depression, and suicidal ideation.

Regarding current smoking and current drinking, those who smoked at least one day in the previous 30 days and those who consumed alcohol at least one day in the previous 30 days were classified as "yes." In this study, "sexual experiences" refers not only to sexual intercourse with the other sex but also to sexual experiences with the same sex. The participants were asked whether they had sexual experiences, with response options of "yes" or "no."

To examine students' sedentary lifestyle, the survey asked whether they spent "two hours or more" or "less than two hours" a day on an average engaged in sedentary activities, except studying, such as watching television, playing games, surfing the web, or chatting. Physical activity was measured using a question asking how many days in the previous seven days participants had engaged in any sort of physical activity for more than 60 minutes with enough intensity to increase their heartbeat or lead them to become out of breath. The response options ranged from "none" (0 point) to "seven days" (7 points).

To check the number of breakfasts eaten, the survey asked the participants how many meals they had had in the morning over the previous seven days. Having only milk or juice was not considered as meals. The response options ranged from "none" (0 point) to "seven days" (7 points).

To check the number of times teeth were brushed per day, they were asked to answer from "none" (0 point) to "more than nine times per day" (9 points). The average value was used for the study.

Further, the survey asked participants how often they washed their hands using soap over the previous seven days. We consider soap as a positive material. The question covered five situations:

before having lunch at school, after using the toilet at school, before having meals at home, after using the bathroom at home, and after coming home from school. The response options were "always" (3 points), "usually" (2 points), "seldom" (1 point), and "never" (0 point). The scores were used to calculate the sum of the answers to the five questions. Thus, score range was 0 to 15.

In terms of wearing seatbelts, the participants were asked whether they wore seatbelts when sitting in the passenger seat of a car (including taxis), when sitting in the backseat of a car (including taxis), and when riding on an express bus. The response options were "always wear" (3 points), "usually wear" (2 points), "seldom wear" (1 point), and "never wear" (0 points). The scores were used to calculate the sum of the answers to the three questions. The score range was 0 to 9.

Subjective health status, subjective happiness, and perceived stress level were measured on a 5-point scale. For subjective health status, the scale ranged from very unhealthy (1 point) to very healthy (5 points). BMI was calculated as kg/m^2 based on self-reported heights and weights.

To assess experiences of depression, participants were asked, "Over the past 12 months, have you experienced sadness or despair to the extent of such feelings interrupting your everyday life, for two consecutive weeks?" Suicidal ideation was assessed using the question, "Have you ever seriously thought about suicide during the past 12 months?"

3. Data analysis

The KCDC, which organized the survey, provided the data file in the form of an SPSS data file, along with a PDF file explaining the outline of the survey and the survey items. The analysis was performed using SPSS Statistics version 21.0 (IBM Co., Armonk, NY, USA). The KYRBWS data were weighted to generate appropriate population estimates. For statistical analysis, we took the complex sampling design of the KYRBWS into consideration. Thus, weighted means or percentages were used to describe the results in this study. The chi-square test and general linear regression for complex sample was conducted to determine whether the socioeconomic and health behavior and psychological status characteristics of adolescents from multicultural background differed from those of adolescents from Korean parent families. Further, multiple logistic regression analyses were carried out to examine whether there were health behavioral and psychological differences between the two groups according to the mother's birthplace after controlling for socioeconomic and health behavior and psychological status characteristics.

RESULTS

1. General characteristics according to mother's nationality

The average age of the adolescents with Korean mothers (15.08) was higher than the average age of the adolescents with foreign mothers (14.84; $p = 0.004$).

The two groups showed significant differences in type of school, father's education level, mother's education level, academic achievement, and socio-economic status. Compared with adolescents whose mothers were Korean, students who had a non-Korean mother were more likely to attend a technical high

school ($p < 0.001$), have parents with a low education level ($p < 0.001$), and have lower socio-economic status ($p < 0.001$). Furthermore, the academic achievement of adolescents with a non-Korean mother was lower than was that of their counterparts ($p < 0.001$; Table 1).

2. Health behavioral and psychological characteristics according to mother's nationality

The bivariate analysis determined that a significantly greater number of adolescent with a non-Korean mother were currently smoking ($p = 0.001$), sexual experiences ($p < 0.001$), and a sedentary life style ($p = 0.003$) compared to their Korean parented

Table 1. Differences in general characteristics according to mother's nationality (n = 65,426)

| Characteristic | Adolescents with | | Total (n = 65,426) | χ^2 or t (p) |
|-----------------------|--|-------------------------------|-----------------------|-------------------|
| | Foreign mother ^a (n = 698) | Korean mother (n = 64,728) | | |
| Age (y) | 14.84 ± 0.80 | 15.08 ± 1.74 | 15.08 ± 0.02 | 2.913 (0.004) |
| Sex | Male | 355 (52.2) | 33,296 (51.8) | 0.041 (0.847) |
| | Female | 343 (47.8) | 31,432 (48.2) | |
| Type of school | Middle school | 406 (53.3) | 32,644 (47.1) | 28.641 (< 0.001) |
| | General high school | 213 (33.7) | 26,028 (43.9) | |
| | Technical high school | 77 (12.9) | 5,676 (8.9) | |
| Father's education | ≤ Middle school | 134 (21.6) | 1,472 (2.2) | 992.194 (< 0.001) |
| | High school | 219 (33.0) | 18,256 (28.4) | |
| | ≥ College | 132 (20.6) | 32,047 (53.1) | |
| | Unknown | 175 (24.8) | 10,941 (16.3) | |
| Mother's education | ≤ Middle school | 63 (10.5) | 1,411 (2.1) | 276.728 (< 0.001) |
| | High school | 191 (27.4) | 23,770 (36.6) | |
| | ≥ College | 240 (33.7) | 28,544 (45.4) | |
| | Unknown | 204 (28.4) | 11,003 (15.9) | |
| Socio-economic status | Low | 57 (9.3) | 1,847 (2.8) | 136.179 (< 0.001) |
| | Middle low | 147 (19.7) | 8,533 (13.2) | |
| | Middle | 344 (48.1) | 30,595 (47.1) | |
| | Middle high | 109 (16.1) | 17,852 (27.8) | |
| | High | 41 (6.8) | 5,901 (9.1) | |
| Academic achievement | Low | 110 (17.3) | 6,735 (10.4) | 33.728 (< 0.001) |
| | Middle low | 185 (25.0) | 15,058 (23.4) | |
| | Middle | 176 (25.0) | 18,225 (28.2) | |
| | Middle high | 157 (22.3) | 16,476 (25.4) | |
| | High | 70 (10.4) | 8,234 (12.6) | |

Values are presented as mean ± standard deviation or number (weighted %).

^aForeign mother's nationalities: Korean-Chinese, 24.9%; Japanese, 24.4%; Philippine, 16.8%; Chinese, 14.8%; others (North Korea, Vietnam, etc), 19.2%.

counterparts. In addition, adolescents with a non-Korean mother showed significantly lower scores in hand washing ($p = 0.001$), wearing seatbelts ($p = 0.001$), subjective health ($p = 0.003$), and subjective happiness ($p = 0.008$), and showed significantly higher scores in perceived stress level ($p = 0.007$; Table 2).

3. Predictors of adolescents' health behavior and psychological status according to mother's nationality

Table 3 shows the results of the multiple logistic regression

analyzing the effect of maternal birthplace on adolescents' health behavior and psychological status after controlling for general characteristics and health behavior characteristics. Adolescents with foreign-born mothers had lower current drinking (95% confidence interval [CI], 0.530–0.991) and lower subjective happiness (95% CI, 0.767–0.982), but higher stress levels (95% CI, 1.014–1.307).

Table 2. Differences in health behaviors and psychological status according to mother's nationality (n = 65,426)

| Characteristic | Adolescents with | | Total (n = 65,426) | χ^2 or t (p) |
|--------------------------------|---------------------------------------|----------------------------|--------------------|-------------------|
| | Foreign mother ^a (n = 698) | Korean mother (n = 64,728) | | |
| Current smoking | | | | |
| No | 634 (88.6) | 60,121 (92.7) | 60,755 (92.7) | 14.493 (< 0.001) |
| Yes | 64 (11.4) | 4,607 (7.3) | 4,671 (7.3) | |
| Current drinking | | | | |
| No | 599 (84.9) | 54,465 (83.7) | 55,064 (83.7) | 0.682 (0.387) |
| Yes | 99 (15.1) | 10,263 (16.3) | 10,362 (16.3) | |
| Sexual experience | | | | |
| No | 630 (89.4) | 61,902 (95.6) | 62,532 (95.6) | 53.085 (< 0.001) |
| Yes | 66 (10.6) | 2,753 (4.4) | 2,819 (4.4) | |
| Depression | | | | |
| No | 522 (74.6) | 49,806 (76.8) | 50,328 (76.7) | 1.442 (0.208) |
| Yes | 176 (25.4) | 14,922 (23.2) | 15,098 (23.3) | |
| Suicidal ideation | | | | |
| No | 605 (86.2) | 57,417 (88.6) | 58,022 (88.6) | 3.275 (0.076) |
| Yes | 93 (13.8) | 7,311 (11.4) | 7,404 (11.4) | |
| Sedentary life (h/day) | | | | |
| < 2 | 508 (76.4) | 50,850 (81.2) | 51,358 (81.1) | 8.112 (0.003) |
| ≥ 2 | 158 (23.6) | 11,767 (18.8) | 11,925 (18.9) | |
| BMI (kg/m ²) | 20.70 ± 0.14 | 20.88 ± 0.02 | 20.88 ± 0.02 | 1.266 (0.206) |
| Physical activity (0–7) | 1.98 ± 0.08 | 1.94 ± 0.02 | 1.94 ± 0.02 | -0.508 (0.611) |
| Breakfast in last 7 days (0–7) | 4.32 ± 0.11 | 4.51 ± 0.02 | 4.51 ± 0.02 | 1.830 (0.068) |
| Teeth brushing in a day (0–9) | 2.62 ± 0.06 | 2.68 ± 0.01 | 2.68 ± 0.01 | 0.899 (0.369) |
| Hand washing (0–15) | 10.14 ± 0.15 | 10.64 ± 0.02 | 10.64 ± 0.02 | 3.406 (0.001) |
| Wearing seatbelt (0–9) | 4.54 ± 0.12 | 4.95 ± 0.02 | 4.94 ± 0.02 | 3.364 (0.001) |
| Subjective health (1–5) | 3.83 ± 0.03 | 3.93 ± 0.01 | 3.93 ± 0.01 | 3.009 (0.003) |
| Subjective happiness (1–5) | 3.73 ± 0.04 | 3.83 ± 0.01 | 3.83 ± 0.00 | 2.642 (0.008) |
| Perceived stress level (1–5) | 3.30 ± 0.04 | 3.20 ± 0.01 | 3.20 ± 0.01 | -2.683 (0.007) |

Values are presented as mean ± standard deviation or number (weighted %).

^aForeign mother's nationalities: Korean-Chinese, 24.9%; Japanese, 24.4%; Philippine, 16.8%; Chinese, 14.8%; others (North Korea, Vietnam, etc), 19.2%.

Table 3. A multiple logistic regression analysis that predicts health behaviors and psychological status of adolescent with a foreign mother (n = 65, 426)

| Characteristic | B | OR (95% CI) |
|----------------------------------|--------|---------------------|
| Current smoking (yes) | 0.021 | 1.021 (0.667–1.564) |
| Current drinking (yes) | –0.322 | 0.725 (0.530–0.991) |
| Sexual experience (yes) | 0.122 | 1.130 (0.729–1.753) |
| Depression (yes) | 0.062 | 1.064 (0.847–1.335) |
| Suicidal ideation (yes) | –0.264 | 0.768 (0.542–1.088) |
| Sedentary life (≥ 2 h/day) | –0.044 | 0.957 (0.764–1.198) |
| Body mass index | –0.021 | 0.979 (0.947–1.012) |
| Physical activity | –0.010 | 0.990 (0.946–1.036) |
| Breakfast in past 7 days | 0.034 | 1.035 (0.996–1.076) |
| Teeth brushing in a day | –0.073 | 0.929 (0.840–1.028) |
| Hand washing | –0.024 | 0.976 (0.945–1.008) |
| Wearing seatbelt | –0.033 | 0.968 (0.930–1.007) |
| Subjective health | 0.096 | 1.101 (0.981–1.235) |
| Subjective happiness | –0.141 | 0.868 (0.767–0.982) |
| Perceived stress level | 0.141 | 1.151 (1.014–1.307) |

OR, odd ratios adjusted for age, sex, type of school, father's education, mother's education, socio-economic status, academic achievement; CI, confidence interval.

DISCUSSION

Korean society has become multiracial and multicultural with the steady inflow of married immigrants and married and naturalized citizens. Because many of these new society members are married immigrant women, their multicultural families are settling down as Korean society members and citizen's neighbors. However, as married immigrant women's spouses are usually older men of low economic standing with low academic qualifications, they often find themselves in a poor socioeconomic environment [15]. In the results of this study, secondary school graduates were more frequent than were university graduates among the fathers of adolescents with a foreign-born mother compared to those with a Korean mother, and in the same context, family socioeconomic status was lower in the families with a foreign-born mother than it was in other families.

In Korea, the rising number of multicultural families has also resulted in continuous growth in the number of children. Despite the conspicuously low birthrate and resultant population decline in the country, the number of students from multicultural families is increasing steadily, and according to data from 2014, it has exceeded 1.1% of the entire student population [3]. However, previous studies [13,14] with multicultural families' adolescents

in Korea have focused on their health risk behaviors such as smoking, drinking, and sexual behaviors.

Accordingly, this study aimed to test differences in comprehensive health behavior and psychological status between adolescents from multicultural families and those from Korean parent families. The findings showed that the adolescents with a foreign-born mother had lower subjective happiness and a higher perceived stress level after controlling for general characteristics, including socioeconomic status. It is known from previous studies [7–9] that multicultural adolescents have higher levels of depression, a higher rate of suicidal attempts, and a higher level of perceived stress. However, there are no previous studies regarding the difference in subjective happiness. It is assumed that government welfare policies for multicultural families and school health education might affect their psychological status.

Meanwhile, the adolescents with a foreign-born mother were more likely to perceive stress than those from Korean parent families. Adolescents from multicultural families may have higher stress recognition rates as they perceive themselves as a minority in the group. In parents and adolescents with different cultural backgrounds, adolescents often serve as linguistic and cultural mediators to non-Korean proficient mothers, which may be an added source of stress [14,16]. In particular, Korea has been a racially homogeneous nation for over 5,000 years. Therefore, adolescents from multicultural families might feel stress recognizing racial discrimination. We could find more efficient methods if we compare and analyze stress factors of adolescents from multicultural families and ones from Korean parent families.

Among the factors that were significant among the adolescents with a foreign-born mother in the univariate analysis—high smoking rate, high rate of sexual experience, long sedentary lifestyle, low rate of hand washing, low rate of wearing seatbelts, low subjective health, low subjective happiness, high perceived stress level—the rate of current drinking was rather low after adjusting for general characteristics, which was distinct from other factors. According to a study by Ko and Sohn [17], the rate of problem drinking among adolescents from multicultural families is reported to be lower than that of the overall adolescent population. However, this only means that the alcohol consumption of adolescents with a foreign-born mother is lower compared to their peers with a Korean mother and does not say that the rate of alcohol consumption itself is low. The rate of current alcohol consumption (drinking at least once in the previous 30 days) of middle and high school students was very high at 15.1% in adolescents with a foreign-born mother and 16.3% in adolescents with a Korean mother. In particular, referring to a study that claimed that stress is a strong risk factor in adolescent drinking

[18], we can predict that the perceived stress level of adolescents with a foreign-born mother will lead to adolescent drinking.

As this study is a secondary data analysis, it could not include variables other than those used to compare the health behaviors and psychological status of the adolescents with foreign-born mothers and those with Korean mothers. This limits the study's ability to control for all confounding variables that could influence the health behaviors and psychological status of the adolescents. However, future study findings would provide new insights into adolescents' health behaviors and psychological status between multicultural families and other families.

The fact that multicultural adolescents, compared to their peers with a Korean mother, have lower subjective happiness and

higher stress levels has important implications. The high percentage of multicultural adolescents not moving up to high school might be highly related to this psychological phenomenon. Thus, our society should pay more attention to the mental health of multicultural adolescents. Schools should also make efforts to protect multicultural adolescents by adopting mental health management programs led by school nurses and counselors.

CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

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