Suicide among Adolescents from Multicultural Families in South Korea

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Abstract

Despite the overall improvement of health and longevity in Korea, suicide rates among adolescents are the highest level among developed countries and are continuously on the rise. This study investigated suicide attempt focusing on the immigration status among adolescents – the population that has been dramatically increasing in the recent decades. Using data of a nationally representative sample of adolescents in Korea (*N*=414,907), we estimated the association between the immigration status and suicide attempt. Our results indicate that having a foreign-born parent(s) is associated with higher risks of experiencing suicide attempts. Although much of the disparity is attributed to family background, school characteristics, and health risky behaviors, the disadvantages of the immigrant youth still remain significant even after all the covariates accounted for. We also found that the association is greater for boys, and for those with foreign born parents or foreign born father. We discussed implications of the findings.

Introduction

Along with the rapid economic development in Korea over the recent decades, individual's health and longevity has significantly improved. For example, the life expectancy in Korea was 66 years in 1980, however, less than three decades later, it is now almost 20 years longer with 85.4 as of 2016 (The World Bank 2018; OECD 2018). The increased longevity reflects the facts that people no longer die from acute and communal diseases, and that survival rates for serious chronic diseases have also improved. Despite the overall enhanced death rate and the highest level of longevity, however, death rate has increased among those who are 10-19 in recent years and the main cause of death in this age group is suicide (Shin et al. 2016; Statistics Korea 2018). In fact, suicide rate among the teenagers (10-19) in Korea is the highest among the Organisation for Economic Co-operation and Development (OECD) countries, and according to the recent statistics, the suicide rate has been continuously on the rise (OECD 2018; Statistics Korea 2018).

A large body of literature identified several factors associated with suicide among adolescents in Korea, including conflicts within family, poor academic performance at school, and violence and bully by peers. However, a recently emerging group – the growing immigrant population has not been well considered in the literature. In this study, we examine suicide attempt among adolescents focusing on the immigration status, using data from survey data of a nationally representative sample of adolescents. We hope that our results here shed light on the importance of health of adolescents among immigrants in Korea where the influx of immigrants has only started in recent years.

Background

Immigration and Emerging Multicultural Families in Korea

Korea has historically been a homogenous society in terms of race and ethnicity as proportions of immigrants were relatively small. However, this demographic scenario has shifted over the last few decades. In 1990, the number of foreign born individuals residing in Korea was approximately 100,000, about 0.2% of a total population, but by 2017 foreign born individuals now comprising approximately 4% of the total population (Statistics Korea 2018). The influx of immigrants and increase of multicultural families in the recent decades have been mainly driven by two social phenomena: (1) a shortage of Korean native workers in manufacturing and agricultural sectors; and (2) a growing number of single Korean men, mostly in rural areas, viewed as not "marriageable" in the domestic marriage market. First, the shortage of workers in Korea stems primarily from rising educational attainment of Koreans starting the early 1980s when Korea expanded opportunities for higher education. In 1970, only about 10% of the young adults (25-34) received post-secondary education, yet by 2015, almost 70% of the young adults had tertiary education (OECD, 2017). This increase in educational attainment has led to over 200,000 low-skilled jobs unfilled, and as results, a number of business companies have created (with sponsor of the Korean government) various industrial training programs to bring foreign-born laborers mostly from other Asian countries (A.E. Kim 2009; N. Kim 2008).

Second, given a rising number of Korean bachelors, increased immigration of women, primarily from China and Southeast Asia to Korea has been occurring for the "non-marriageable" Korean men. While the immigration of foreign-born laborers is relatively temporary because of the work visa, immigration of foreign born brides is intended to be more permanent and the international marriages between Korean men and foreign born women are the major form of "multicultural family" – the term that the Korean government has used for official

documents in an effort to help the new comers adjust to the society. International marriage in modern Korea is not new, as it has been observed starting around the early 20th century until early 1990s. During this time, a majority of international marriages were between Korean *women* and Japanese men during the Japanese forced occupation period or between Korean *women* and American men in U.S. military bases in Korea (H.K. Lee 2008). However, since the early 1990s, more international marriages have been occurring between Korean *men* and foreign born women. Similar to the influx of immigrant workers due to the shortage of manual workers in Korea, the international marriages between Korean men and foreign born brides have been driven partly by the increase in the educational attainment since 1980s. Accompanied by urbanization, women left their rural home town to pursue a higher education or a job in a city. However, men with lower education and limited economic resources in rural areas stayed with their parents out of family obligation to continue the family farm work and support their older parents (M. Kim 2018). As results, there have been considerably more men than women among young adults in rural areas, and this gender imbalance has created a substantial shortage of brides for the rural bachelors. In response to the shortage of the brides, a number of government entities and commercial agencies started to find brides within the country, and soon after, these efforts have been expanded to China and other Asian countries, where a growing number of people would consider immigrating to Korea for an economic opportunity (M. Kim 2018). Therefore, while the overall number of international marriages has increased for both Korean women married to foreign born men and Korean men married to foreign born women, the growth of marriages between Korean men and foreign born women has been more dramatic. In recent years, almost 8% of the new marriages are international marriages in Korea and about 80% of the international

marriages primarily consist of foreign-born brides married to Korean men (Korean Statistical Information Service 2017).

Given the increase of immigrant population in Korea, the proportion of children with at least one foreign born parent has also increased. Currently, the number of births from international couples comprises about 5% of the total births (Korean Statistical Information Service 2017), and while growing, these second generation immigrant children and adolescents (12-18) are about 1% of the youth in Korea (authors' calculation). Despite the growing importance of the immigrant youth, existing literature looking at the association between the immigration status and suicide is still limited, and to our knowledge, only one study examined factors contributing to suicidal ideation among the immigrant youth. For example, using survey data from a sample of the immigrant youth, Park and colleagues (2013) reported that unhealthy behaviors (e.g. under-age drinking, drug use, and violence experience), and experience of adverse health outcomes (e.g. unhappiness and depression) are associated with higher rates of developing suicidal ideation. While informative, this study also reveals limitations such that the analysis included neither a non-immigrant comparison group nor potential mechanisms that possibly explain any immigrant disadvantages, including parent's socioeconomic status, and school related characteristics. Thus, it still remains unclear if the immigrant youth have higher risks of experiencing suicide attempt compared to their non-immigrant youth, and if so, what possibly explains this disparity.

Additionally, when examining suicide associated with the immigration status in Korea, it is important to consider gender. While it is expected that the immigrant youth may have higher risks of experiencing suicide attempt, the adverse association between the immigration status and suicide attempt may be greater for boys. In general, parental and family scrutiny is greater for

daughters' compared to sons' lives, especially in immigrant families (Dion and Dion, 2001). Given the unique way that the majority of multicultural families in Korea have been formed between Korean men and foreign born women, it is reasonable to expect that the level of parental scrutiny may be salient especially for girls. While the traditional gendered expectation may cause tensions and conflicts with parents, it may prevent girls from engaging in health risky behaviors, such as smoking, drinking, and drug use, and violence experience with peers, leading boys from multicultural families more vulnerable to suicide attempt.

In addition to the gender variation, country origins of the foreign born parents should also be considered when looking at how the immigrant status is associated with health outcomes. As indicated above, the majority of the immigrant children and adolescents in Korea are children of international couples between Korean men (who are older, low educated, working in manufacturing/agricultural industries, and residing in rural areas) and foreign born marriage migrants. However, multicultural families are a very diverse group, in terms of country origins of the foreign born parents. In fact, even among the multicultural families, some of the immigration laws and existing resources at community and local government levels benefit only international couples who married through government sponsored marriage promotion programs. Thus, it would be meaningful to glance at possible variations by country origins of the foreign born parent(s).

This study is designed to address this gap in the literature on the immigration status among youth in Korea, focusing on suicide attempt, a critical health concern for children and adolescents. Using data from a nationally representative sample of adolescents, we address three research questions: (1) What is the association between the immigration status and suicide attempt?; (2) To what extent do family background, school characteristics, and health behaviors

explain the association?; (3) Does the association vary by gender of the respondent and the origin of the foreign born parent's country?

Data and Methods

Data

We used data from the Korea Youth Risk Behavior Survey (hereafter KYRBS), which has been conducted by the Korean Centers for Disease Control and Prevention. The KYRBS is a school-based survey designed to collect information from adolescents (7^{th}-12^{th} graders) about their health conditions, health behaviors, and family background. As a cross-sectional survey, the KYRBS has been conducted annually since 2005, with twelve rounds currently available, including the most recent round collected in 2016. The KYRBS offers several unique advantages given our research questions. First, starting in 2011, the KYRBS has collected information about parental immigrant status (i.e., whether the parents were born in Korea, and if not, in which country they were born). Although there are other national surveys containing similar information about immigrant status (e.g., Korean Children & Youth Panel Survey), the KYRBS provides more detailed information about immigrant status for both fathers and mothers of adolescent respondents compared to other existing surveys. Another advantage of the KYRBS is its inclusion of various other health outcomes, such as self-rated health, global happiness, stress level, depression, and body mass index (i.e. height and weight), allowing to examine suicide among adolescents in associations with other health conditions. Finally, the KYRBS contains a large number of adolescent respondents, with more than 60,000 adolescents surveyed at each round, allowing us to produce reliable estimates for second generation immigrant adolescents who have at least one foreign-born parent. For this study, we pooled six rounds of the KYRBS

(2011-2016) that include information on parental immigrant status. After excluding respondents who answered with abnormal values on age and height/weight (i.e. 12,925 cases, 3% of the entire pooled sample), the analytic sample included 414,970 respondents including 3,789 immigrant adolescents.

Measures

Suicide. Our dependent variable is suicide attempt. In the KYRBS, respondents were asked if they have attempted committing a suicide in the past 12 months (1=yes; 0-no).

Immigrant status. For our independent variable, we used information about whether either of the respondent's parents was foreign born. If either or both of the parents were foreign born, we identified the respondent as second generation and coded the immigrant status variable as 1 (i.e. immigrants); otherwise the immigrant status variable was coded as 0 (i.e. non-immigrants). In this categorization of the immigrant status, it should be noted that in our sample, first generation immigrant youth were included as either second generation immigrants or non-immigrants depending on country origins of the parents due to a lack of information on the respondent's own immigration status. The number of the first generation immigrants should be very small and we do not expect this group to critically affect our results. We will discuss this data limitation later in the paper.

Sociodemographic Controls. We included age (i.e. 12-18, in years), gender (i.e. 0=male; 1=female), and respondent's living arrangement (i.e. living with both parents; living with a single mother; living with a single father; and living with none of the parents) as demographic controls. Related to parent's socioeconomic conditions, we included both father's and mother's educational attainment (i.e. less than high school; high school (ref.); and some college or higher),

and self-reported parent's financial resources (1=less wealthy to 5=wealthy). We also considered urbanity of respondent's residential area: big city (ref.); small/mid-size city; and rural area. Additionally, in order to account for the survey period from 2011 to 2016, we included a variable representing the survey year in our analysis.

School Related Information, Health Behaviors, and Health Conditions. We considered three mechanisms as potential mediators in explaining the association between the immigration status and suicide: school characteristics; health behaviors; and other health conditions. First, for school related information, we included academic performance and school type. Academic performance was measured by respondent's self-reported school performance (1=poor to 5=excellent). School type was categorized into 'middle school (ref.),' 'special vocational high school,' and 'general academic high school.' Second, for health behaviors, we included five variables, including body mass index (BMI), cigarette smoking, alcohol consumption, substance drug use, and serious violence experience. For BMI variable, we calculated the index based on values of weight and height (i.e. weight in kilograms / height in meters^2), and then categorized the values into three groups: underweight (<18.5); normal weight (18.5-23); and overweight (>23). For smoking, drinking, and drug use, we used three questions. For example, respondents were asked in the past 12 months if they have ever: smoked a cigarette, even a little; consumed more than one glass of alcohol; and used any substance drug. For those who said yes, we assigned 1, and 0 for otherwise. If they have done itin the past 12 months (1=yes; and 0=no). For serious violence experience, we used a question about if respondents have been treated at a hospital because of violence in the past 12 months (1=yes; and 0=no). Lastly, we included health conditions measured by five health outcomes: (1) self-rated health (1=poor to 5=excellent); (2) depression, measured by a question of whether a respondent was too sad or hopeless to live a daily life at

least for two weeks in the past 12 months (1=yes; 0=no); (3) global happiness (1=not at all happy to 5=very happy); (4) perceived stress level (1=not at all stressed to 5=very stressed); and (5) sleep satisfaction, measured by a question of how satisfied a respondent was with sleeping in the past 7 days (1=very satisfied to 5=not at all satisfied).

Other controls. In order to account for whether suicide was attempted out of impulsive decision or after suicidal thoughts, we also considered one variable indicating if respondents have thought about committing a suicide in the past 12 months (1=yes; and 0=no). Lastly, we created a set of subcategories for the country origins of the foreign born parent(s) for the purpose of examining potential variation in the association between the immigration status and suicide attempt. Considering the marriage immigration history in Korea, cultural similarities/differences across the countries, and statistical feasibility, we further specified the immigrant youth (i.e. those who have at least one foreign born parent) into five subgroups: (1) those whose both parents were or only father was foreign born; (2) those whose mothers are Chinese Korean or from North Korea; (3) those whose mothers were born in East Asian Countries (i.e. China, Japan, and Taiwan); (4) those whose mothers were born in Southeast Asia (i.e. Vietnam, the Philippines, Thailand, and Cambodia) or Mongolia; and (5) those whose mothers were born in Uzbekistan, Russia and others. See Appendix 1 for the frequencies of the subgroups.

Analytic Plan

We estimated logistic regression models to examine if suicide attempt was associated with the immigration status, and to what extent family background, school context, and other health conditions accounted for the association. Additionally, in order to explore if the

association varies by respondents' gender and country origins of the parent(s) among the immigrant youth. In particular, Model 1 estimates the bivariate association between the immigration status and the risk of suicide attempt. Model 2 adds respondent's demographic information (i.e. age, gender, and survey year) to Model 1 to account for potential compositional confounders. For Model 3, we introduced family background, measured by parent's educational attainment, parents' financial resources, and whether respondents reside in urban or rural area, to address our second research question of whether the health disadvantage of the immigrant adolescents reflects negative immigration selection. Model 4 further adds information on school related characteristics (i.e. school type, and overall academic performance). Respondent's health behaviors (i.e. BMI, cigarette smoking, alcohol consumption, drug use, and violence experience) and health conditions (i.e. self-rated health, depression, global happiness, stress level, sleep satisfaction) were included in Models 5 and 6, respectively. For Model 7, we added suicidal ideation variable to Model 6. Lastly, we estimated the full model (i.e. Model 7) to examine if the association varies by gender and country origins of the parent. All the results presented here were weighted to adjust for the complex sampling design using 'svy' command in STATA, unless otherwise indicated.

Results

Descriptive Statistics

We present the sample characteristics in Table 1.

(Table 1 about here)

In our sample, about 1% of the respondents are from multicultural families. They seem to have higher risks of suicide attempt compared to their non-immigrant counterpart. In Table 1, 15.7%

of the youth experienced suicide attempt in the past 12 months, this percentage is higher among the immigrant youth (i.e. 16.33%). As suspected, this difference may result from disadvantaged family background among the immigrant youth. While the majority of the respondents live with both parents, compared to the non-immigrant youth, the immigrant youth are more likely to live with a single parent (mother rather than father), and those who live with none of the parents are also more prevalent among the immigrant youth. Educational attainments of the parents are also lower among the immigrant youth, and they also tend to report a lower level of financial resources at home. Over 16% of the immigrant youth are more commonly found in rural areas, while only about 6% of the non-immigrant youth live in rural areas.

In terms of school related characteristics, the average age of the immigrant youth is younger (and thus more are in middle school). However, among the high school students, the immigrant youth are more likely to attend specialized vocational school, rather than general academic school. It is not surprising given that in Korea, children from less affluent families are more encouraged to attend specialized vocational school, instead of general academic school. Students in specialized vocational school are expected to find a paid work after graduation, so they become financially independent enough to help out their parents. The immigrant youth are less academically achieving, and more likely to engage in cigarette smoking, drug use, and violence experience as a victim. However, the lower percentage of immigrant youth had consumed alcohol. Turning to other health conditions, overall, the immigrant youth seem disadvantaged as well, with an exception of perceived stress level. They tend to report lower levels of self-rated health and overall happiness, and more likely to experience depressive symptoms. Additionally, the immigrant youth are more likely to develop suicidal ideation compared to the non-immigrant youth.

The disadvantages of the immigrant youth, in terms of the negative selection of the immigrant parent(s), seem varying by which parent is foreign born and the country origins of the foreign born parent(s). See Appendix 2 for more detailed information about the sample characteristics of the subgroups. While we refrained from describing the different characteristics in the text, we used this categorization when examining variations in the association between the immigration status and suicide attempt later.

Regression Results

Results of the regression models are presented in Tables 2 and 3. First, Table 2 shows how the immigration status is associated with suicide attempt.

(Table 2 about here)

According to the results in the table, the immigrant youth are more likely to experience suicide attempt, compared to their non-immigrant youth. As expected, this disparity is substantially mediated by our proposed mechanisms, such as family background, school characteristics, and health risky behaviors. However, the negative association still remains significant even after the mediators. When we introduced other health conditions, such as self-rated health, global happiness, depression, perceived stress and sleep satisfaction, the coefficient of our independent variable increased, implying that the health conditions are confounding factors. Additionally, in Model 7, having suicidal ideation also leads to higher risks of suicide attempt, indicating that suicide attempt among adolescents is not necessary impulsive. Finally, the negative coefficient of the interaction term shows that although girls tend to have higher risks of experiencing suicide attempt than boys, the adverse association between the immigration status and suicide attempt is

greater for boys. We further examined variations in the association by the country origins of the parents.

(Table 3 about here)

We only presented the coefficients of the independent variables because the directions and magnitudes of the coefficients of other covariates are consistent with the ones in Table 2. According to the results in Table 3, the higher risks of experiencing suicide attempt is greater among the immigrant youth whose both parents are foreign born, whose fathers are foreign born, whose mothers are Chinese Korean or North Korean, or whose mothers were born in Uzbekistan, Russia or other countries. Most of the disparity among these groups seem mediated by the disadvantageous family background, school related characteristics, and health risky behaviors. However, the ones with foreign born fathers, especially those whose both parents were foreign born seem particularly vulnerable, as the coefficients of these groups remain statistically significant with all the covariates accounted for.

Discussion

The health, especially among children and youth, is critical, as it leads to a successful transition into adulthood, and subsequently health and wellbeing over the life course (Palloni 2006). This study contributes to the literature by focusing on suicide attempt for adolescents from the multicultural families in Korea, using survey data based on a nationally representative sample of youth (i.e. the Korea Youth Risk Behavior Survey). Our results indicate that having a foreign-born parent(s) is associated with higher risks of experiencing suicide attempts. Although much of the disparity is attributed to family background, school characteristics, and health risky behaviors, the disadvantages of the immigrant youth still remain significant even after all the

covariates accounted for. We also found that the association is greater for boys, and for those with foreign born parents or foreign born father. These findings imply that policy makers and community organizers should target these groups when designing and implementing public assistant programs for the immigrant youth to help remove health disparities during childhood.

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Table 1. Sample Characteristics (*N*=414,970)

	Total			Non-multicultural family			Multicultural family		
Variables	mean	*n*	%	mean	*n*	%	mean	*n*	%
Health characteristics									
Suicidal ideation (1=yes; 0=no)									
Yes		62,486	15.07		61,901	15.06		585	16.33
No		352,484	84.93		349,280	84.94		3,204	83.67
Suicide attempt (1=yes; 0=no)									
Yes		13,324	3.18		13,141	3.16		183	5.09
No		401,646	96.82		398,040	96.84		3,606	94.91
BMI									
Underweight		102,976	24.67		101,839	24.64		1,137	28.86
Normal		223,417	53.95		221,592	53.99		1,825	48.82
Overweight		88,577	21.38		87,750	21.37		827	22.32
Self-rated health (1=poor; 5=excellent)	3.86			3.86			3.80		
Global happiness (1=very unhappy; 5=very l	3.72			3.72			3.70		
Stress level (1=very stressed; 5=not at all st	3.28			3.28			3.29		
Depression (1=yes; 0=no)									
Yes		117,411	28.28		116,329	28.27		1,082	29.60
No		297,559	71.72		294,852	71.73		2,707	70.40
Covariates									
Age	15.03			15.04			14.68		
Female		203,416	47.68		201,531	47.68		1,885	48.00
Living arrangement									
Living with both parents (ref.)		345,616	84.07		342,633	84.13		2,983	76.93
Living with a single mother		38,427	9.19		37,985	9.16		442	12.55
Living with a single father		18,965	4.22		18,773	4.22		192	5.34
Living with none of the parents		11,962	2.51		11,790	2.49		172	5.19
Survey year									
2011 (ref.)		73,474	17.98		73,014	18.02		460	12.54
2012		72,229	17.61		71,703	17.64		526	13.95
2013		70,354	17.24		69,637	17.24		717	17.93
2014		69,959	16.55		69,318	16.54		641	17.47
2015		65,669	15.68		64,963	15.66		706	18.21
2016		63,285	14.93		62,546	14.89		739	19.91
Mother's education									
Less than high school		13,337	2.97		13,077	2.94		260	6.92
High school (ref.)		166,458	39.96		165,278	40.03		1,180	30.95
Some college or higher		158,621	39.71		157,351	39.76		1,270	33.98
Don't Know		76,554	17.35		75,475	17.27		1,079	28.15
Father's education									
Less than high school		14,217	3.10		13,610	3.01		607	15.11
High school (ref.)		131,026	30.78		129,823	30.78		1,203	30.50
Some college or higher		190,126	47.94		189,286	48.12		840	24.85
Don't Know		79,601	18.18		78,462	18.09		1,139	29.54
Family economic status (1=less wealthy; 5=	3.18			3.18			2.92		

(Continued on the next page)

Residential area									
Rural area		41,950	6.29		41,031	6.21		919	16.34
Middle/small city		186,991	49.66		185,354	49.67		1,637	47.88
Big city (ref.)		186,029	44.05		184,796	44.12		1,233	35.78
Overal academic performance (1=poor; 5=e	3.01			3.01			2.77		
School type									
Middle school (ref.)		209,343	48.24		206,944	48.15		2,399	59.77
High school									
Specialized vocational school		42,011	9.91		41,595	9.89		416	12.09
General academic school		163,616	41.85		162,642	41.96		974	28.14
Tobacco Experience (1=yes; 0=no)		84,858	20.69		84,096	20.68		762	21.93
Alcohol Experience (1=yes; 0=no)		181,498	44.04		180,171	44.10		1,327	36.76
Drug Experience									
Yes		2,991	0.73		2,905	0.71		86	2.89
No		346,310	83.59		343,313	83.63		2,997	78.89
DK		65,669	15.68		64,963	15.66		706	18.21
Sleep Satisfaction	3.17			3.17			3.09		
School Violence									
Yes		8,339	2.00		8,171	1.98		168	4.77
No		333,157	80.02		329,996	80.00		3,161	82.69
DK		73,474	17.98		73,014	18.02		460	12.54
Total (*N*)		414,970			411,181			3,789	

Note: The means and percentages are weighted to account for the complex survey design, while the frequencies are unweighted.

Table 2. Immigration Status and Suicide by Gender (*N*=414,970)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Immigration status (ref: no)								
Yes	0.4958***	0.5085***	0.3729***	0.3382***	0.1876*	0.2401*	0.2939**	0.6528***
	(0.0892)	(0.0899)	(0.0862)	(0.0857)	(0.0912)	(0.0903)	(0.0863)	(0.1237)
Female		0.6287***	0.6247***	0.6343***	0.9324***	0.4957***	0.3497***	0.3574***
		(0.0238)	(0.0233)	(0.0236)	(0.0241)	(0.0212)	(0.0198)	(0.0199)
Age (centered on 12)		-0.1022***	-0.1251***	-0.0405***	-0.1142***	-0.1399***	-0.0993***	-0.0994***
		(0.0067)	(0.0072)	(0.0089)	(0.0094)	(0.0096)	(0.0102)	(0.0102)
Survey year (ref: 2011)								
2012		-0.0809**	-0.0842**	-0.0701*	1.4650***	1.0777***	0.9016***	0.9028***
		(0.0269)	(0.0269)	(0.0268)	(0.0426)	(0.0449)	(0.0438)	(0.0439)
2013		-0.0683*	-0.0606*	-0.0327	1.5730***	1.1769***	1.0476***	1.0488***
		(0.0295)	(0.0298)	(0.0300)	(0.0429)	(0.0463)	(0.0418)	(0.0419)
2014		-0.4403***	-0.4246***	-0.3872***	1.2516***	0.9826***	0.9200***	0.9210***
		(0.0361)	(0.0354)	(0.0353)	(0.0415)	(0.0427)	(0.0397)	(0.0397)
2015		-0.6505***	-0.6201***	-0.5872***	-0.2450**	-0.2479**	-0.0765	-0.0739
		(0.0392)	(0.0391)	(0.0388)	(0.0737)	(0.0827)	(0.0789)	(0.0790)
2016		-0.6550***	-0.6195***	-0.5807***	1.1423***	0.8888***	0.8130***	0.8145***
		(0.0438)	(0.0424)	(0.0423)	(0.0550)	(0.0568)	(0.0503)	(0.0503)
Living Arrangement (ref: living with both parents)								
only mother			0.2828***	0.2710***	0.1861***	0.1186**	0.1136**	0.1144**
			(0.0403)	(0.0399)	(0.0403)	(0.0384)	(0.0386)	(0.0386)
only father			0.4673***	0.4056***	0.2551***	0.1299**	0.0897+	0.0883+
			(0.0343)	(0.0343)	(0.0358)	(0.0409)	(0.0454)	(0.0452)
neither parents			0.7849***	0.7580***	0.4390***	0.3248***	0.2462***	0.2440***
			(0.0334)	(0.0334)	(0.0366)	(0.0353)	(0.0395)	(0.0398)
Mother 's education (ref: high school)								
Less than middle school			0.0874	0.0666	0.0385	0.0131	-0.0531	-0.0552
			(0.0700)	(0.0703)	(0.0721)	(0.0734)	(0.0765)	(0.0762)
Somc college			0.1171***	0.1601***	0.1649***	0.1208***	0.0881**	0.0888**
			(0.0298)	(0.0297)	(0.0285)	(0.0273)	(0.0278)	(0.0278)
DK			0.0970**	0.0432	0.0750*	0.1060**	0.1186***	0.1190***
			(0.0327)	(0.0335)	(0.0339)	(0.0348)	(0.0332)	(0.0330)
Father's education (ref: high school)								
Less than middle school			0.2321***	0.2183***	0.1980**	0.1654**	0.1400*	0.1403*
			(0.0597)	(0.0602)	(0.0607)	(0.0599)	(0.0613)	(0.0614)
Some college			0.0183	0.0742*	0.1018**	0.0494	0.0184	0.0177
			(0.0313)	(0.0312)	(0.0301)	(0.0305)	(0.0319)	(0.0318)
DK			-0.0187	-0.0614	-0.0481	-0.0242	-0.0064	-0.0066
			(0.0383)	(0.0390)	(0.0383)	(0.0412)	(0.0410)	(0.0410)
Family socioeconomic status (1=less wealthy; 5=wealthy)			-0.1951***	-0.1206***	-0.1143***	0.0330*	0.0483***	0.0482***
			(0.0161)	(0.0165)	(0.0157)	(0.0134)	(0.0132)	(0.0132)
City type (ref: big city)								
Middle/small city			0.0010	-0.0091	-0.0178	-0.0200	0.0073	0.0071
			(0.0516)	(0.0502)	(0.0460)	(0.0359)	(0.0317)	(0.0317)
Rural area			0.0236	0.0169	-0.0122	-0.0041	0.0580	0.0578
			(0.0652)	(0.0621)	(0.0571)	(0.0482)	(0.0467)	(0.0466)

(Continued on next page)

School type (ref: Middle School)								
general academic high school				-0.0933+	-0.2679***	-0.2019***	-0.0709	-0.0714
				(0.0516)	(0.0486)	(0.0469)	(0.0484)	(0.0484)
vocational high school				-0.4426***	-0.4109***	-0.4047***	-0.3573***	-0.3580***
				(0.0384)	(0.0380)	(0.0393)	(0.0425)	(0.0425)
Academic grade (1=poor; 5=excellent)				-0.2406***	-0.1530***	-0.0501***	-0.0710***	-0.0710***
				(0.0072)	(0.0078)	(0.0074)	(0.0086)	(0.0087)
BMI (ref: normal weight)								
Underweight					0.0367	0.0420	0.0433	0.0426
					(0.0252)	(0.0269)	(0.0276)	(0.0276)
Overweight					0.0801**	0.0469	-0.0001	-0.0001
					(0.0274)	(0.0306)	(0.0317)	(0.0317)
Smoking Experience					0.7965***	0.5981***	0.5015***	0.5020***
					(0.0291)	(0.0308)	(0.0328)	(0.0329)
Alcohol Experience					0.5608***	0.3107***	0.1840***	0.1842***
					(0.0223)	(0.0233)	(0.0251)	(0.0251)
Drug experience (ref: yes)								
No					-1.3817***	-1.1860***	-0.9397***	-0.9380***
					(0.0601)	(0.0672)	(0.0688)	(0.0683)
School violence experience (ref: no)								
Yes					1.6260***	1.2250***	0.9977***	0.9982***
					(0.0334)	(0.0379)	(0.0324)	(0.0325)
Subjective health (1=poor; 5=excllent)						-0.1087***	-0.0846***	-0.0845***
						(0.0139)	(0.0129)	(0.0129)
Depression experience (ref: no)								
Yes						1.5833***	0.6544***	0.6545***
						(0.0308)	(0.0297)	(0.0297)
Global happiness (1=unhappy; 5=very happy)						-0.3717***	-0.1584***	-0.1588***
						(0.0136)	(0.0132)	(0.0132)
Stress level (1=very stressed; 5=not at all stressed)						0.3590***	0.0897***	0.0896***
						(0.0166)	(0.0144)	(0.0144)
Sleep satisfaction (1=satisfied; 5=not statisfied)						0.0387**	0.0230*	0.0228*
						(0.0120)	(0.0111)	(0.0111)
Serious suicidal thought (ref: no)								
Yes							3.2074***	3.2070***
							(0.0362)	(0.0363)
Interaction Term								
Immigrant X Female								-0.6686***
								(0.1703)
Constant	-3.4212***	-3.2076***	-2.7115***	-2.3723***	-1.8391***	-2.9436***	-4.1016***	-4.1062***
	(0.0238)	(0.0247)	(0.0577)	(0.0570)	(0.0840)	(0.1356)	(0.1318)	(0.1318)

Note: All the estimates are weighted to account for the complex survey design. †p< .10; *p<.05; **p< .01; and ***p< .001 (two-tailed).

Table 3. Suicide Attempt Regressed on Immigration Status by Country Origin of Parents (*N*=414,970)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Parents' nationality (Ref: Both Kroean Parents)							
both foreign parents	1.3599***	1.5152***	1.3508***	1.3073***	0.7199**	0.7930**	0.8025**
	(0.2327)	(0.2317)	(0.2312)	(0.2370)	(0.2568)	(0.2878)	(0.2701)
ONLY father foreign-born	1.0806***	1.1567***	0.9567***	0.8811***	0.5029+	0.4990*	0.5830+
	(0.2096)	(0.2155)	(0.2144)	(0.2195)	(0.2648)	(0.2490)	(0.2934)
Only mother foreign-born							
Chinese Korean/North Korean	0.3568*	0.3130+	0.1764	0.1574	0.0073	0.0900	0.1601
	(0.1617)	(0.1637)	(0.1600)	(0.1602)	(0.1755)	(0.1894)	(0.1859)
China/Japan/Taiwan	-0.1695	-0.1784	-0.2731	-0.2882	-0.1312	-0.0738	-0.0138
	(0.2042)	(0.2059)	(0.2091)	(0.2100)	(0.2029)	(0.2193)	(0.2239)
Vietnam/the Philippines/Mongolia/Thailand/Cambodia	0.0465	0.0537	-0.1071	-0.1559	-0.1212	-0.1503	-0.1352
	(0.2355)	(0.2370)	(0.2408)	(0.2427)	(0.2463)	(0.2489)	(0.2693)
Uzbekistan/Russia/others	1.2670***	1.2996***	1.1450**	1.0520**	0.6475	0.8286	0.9154
	(0.3369)	(0.3450)	(0.3475)	(0.3506)	(0.5170)	(0.5555)	(0.6968)
Constant	-3.4212***	-3.2068***	-2.7044***	-2.3658***	-1.8430***	-2.9491***	-4.1047***
	(0.0238)	(0.0246)	(0.0577)	(0.0572)	(0.0844)	(0.1354)	(0.1318)

Note: Model 2 adds demographic information (gender, age, and survey year); Model 3 adds family background (living arrangement, parents' education, family financial resources, and residential area); Model 4 adds school related information (academic performance and school type); Model 5 adds health risky behaviors (BMI, smoking, drinking, drug use, and violence experience); Model 6 adds health conditions; and Model 6 adds suicidal ideation.

All the estimates are weighted to account for the complex survey design. †p< .10; *p<.05; **p< .01; and ***p< .001 (two-tailed).

Appendix 1. Country Origin of Foreign Born Parents

	Country Origin of Father		Country Origin of Mother	
Country Origin	n	%	n	%
China(Korean Chinese)	123	17.15	948	27.84
China(Han, or other ethnic groups)	58	8.09	422	12.39
North Korea	86	11.99	116	3.41
Vietnam	23	3.21	140	4.11
Philippines	26	3.63	438	12.86
Japan	159	22.18	998	29.31
Taiwan	20	2.79	26	0.76
Mongolia	24	3.35	45	1.32
Thailand	3	0.42	62	1.82
Cambodia	14	1.95	25	0.73
Uzbekistan	30	4.18	34	1
Russia	13	1.81	32	0.94
Other	138	19.25	119	3.49
Total	717	100	3,405	100

Source: Korea Youth Risk Behavior Survey (KYRBS) (2011-2016)

Appendix 2. Sample Characteristics by Country Origins of the Parents

										w/ only foreign born mother												
	Multicultural family (Total)			Both Foreign born parents			w/ only foreign born father			Chinese Korean, North Korean			China/Japan/Taiwan			Vietnam, Philippines, Mongolia, Thailand, Cambodia			Uzbekistan, Russia, Others		
Variables	mean	*n*	%	mean	*n*	%	mean	*n*	%	mean	*n*	%	mean	*n*	%	mean	*n*	%	mean	*n*	%
Female		1,885	48.00		130	36.92		178	43.81		505	54.78		672	46.10		342	52.16		58	49.35
Health characteristics																					
Suicidal ideation (1=yes; 0=no)																					
Yes		585	16.33		75	15.07		77	21.56		154	16.68		167	12.23		92	15.68		20	20.91
No		3,204	83.67		258	84.93		307	78.44		768	83.32		1,219	87.77		549	84.32		103	79.09
Suicide attempt (1=yes; 0=no)																					
Yes		183	5.09		35	11.29		34	8.78		40	4.46		39	2.68		24	3.31		11	10.39
No		3,606	94.91		298	88.71		350	91.22		882	95.54		1,347	97.32		617	96.69		112	89.61
BMI																					
Underweight		1,137	28.86		84	25.45		95	24.57		206	21.72		469	33.64		247	35.09		36	29.44
Normal		1,825	48.82		175	51.50		219	57.11		439	49.44		666	47.13		271	43.82		55	46.18
Overweight		827	22.32		74	23.05		70	18.32		277	28.84		251	19.23		123	21.09		32	24.38
Self-rated health (1=poor; 5=excellent)	3.80			3.94			3.79			3.72			3.79			3.89			3.88		
Global happiness (1=very unhappy; 5=very happy)	3.70			3.74			3.57			3.64			3.74			3.77			3.75		
Stress level (1=very stressed; 5=not at all stressed)	3.29			3.33			3.33			3.35			3.24			3.26			3.30		
Depression (1=yes; 0=no)																					
Yes		1,082	29.60		121	36.79		145	39.33		250	28.45		340	24.66		192	30.15		34	31.04
No		2,707	70.40		212	63.21		239	60.67		672	71.55		1,046	75.34		449	69.85		89	68.96
Covariates																					
Age	14.68			15.27			15.10			14.63			14.59			14.29			14.36		
Living arrangement																					
Living with both parents (ref.)		2,983	76.93		230	68.63		215	56.41		717	74.62		1,210	86.40		529	82.58		82	68.13
Living with a single mother		442	12.55		37	11.22		87	21.10		129	16.74		111	8.48		56	8.63		22	15.47
Living with a single father		192	5.34		12	2.84		43	11.78		48	5.66		39	3.21		37	5.13		13	10.98
Living with none of the parents		172	5.19		54	17.31		39	10.71		28	2.98		26	1.92		19	3.67		6	5.42
Survey year																					
2011 (ref.)		460	12.54		53	18.41		56	15.62		123	12.11		168	12.34		49	7.55		11	10.33
2012		526	13.95		44	12.84		55	15.93		146	14.85		206	14.88		61	9.46		14	13.21
2013		717	17.93		59	14.22		66	15.43		189	18.46		268	20.38		117	16.97		18	12.77
2014		641	17.47		65	19.87		68	17.24		141	17.87		238	16.43		105	16.68		24	22.04
2015		706	18.21		45	14.23		71	17.98		158	17.80		253	17.57		156	23.96		23	16.41
2016		739	19.91		67	20.43		68	17.79		165	18.92		253	18.40		153	25.37		33	25.25
Mother's education																					
Less than high school		260	6.92		64	20.64		16	4.62		100	10.55		43	2.44		31	4.63		6	3.55
High school (ref.)		1,180	30.95		79	23.60		96	24.99		368	39.75		453	31.80		154	25.51		30	24.93
Some college or higher		1,270	33.98		98	29.94		151	39.18		162	18.41		565	42.06		239	36.17		55	46.80
Don't Know		1,079	28.15		92	25.82		121	31.21		292	31.29		325	23.70		217	33.68		32	24.72
Father's education																					
Less than high school		607	15.11		59	19.14		30	7.52		161	16.93		209	13.95		139	19.87		9	8.33
High school (ref.)		1,203	30.50		69	19.53		59	14.85		358	37.85		484	33.48		201	31.96		32	28.32
Some college or higher		840	24.85		106	33.29		211	56.57		79	10.18		328	25.90		73	12.56		43	35.33
Don't Know		1,139	29.54		99	28.03		84	21.06		324	35.04		365	26.68		228	35.61		39	28.01
Family economic status (1=less wealthy; 5=wealthy)	2.92			3.24			3.08			2.82			2.85			2.84			3.09		
Residential area																					
Rural area		919	16.34		27	5.74		35	4.80		221	16.02		413	20.30		207	26.50		16	7.07
Middle/small city		1,637	47.88		143	44.56		166	48.17		423	51.84		561	45.98		295	48.02		49	47.59
Big city (ref.)		1,233	35.78		163	49.70		183	47.03		278	32.14		412	33.72		139	25.48		58	45.34
Overal academic performance (1=poor; 5=excellent)	2.77			3.01			2.84			2.70			2.82			2.60			2.62		
School type																					
Middle school (ref.)		2,399	59.77		187	55.80		214	55.39		581	60.17		864	58.45		472	67.75		81	63.85
High school																					
Specialized vocational school		416	12.09		49	13.23		38	10.73		109	12.86		140	11.83		68	12.84		12	7.49
General academic school		974	28.14		97	30.97		132	33.88		232	26.97		382	29.72		101	19.41		30	28.66
Tobacco Experience (1=yes; 0=no)		762	21.93		112	35.46		105	27.58		209	24.78		198	14.73		99	16.70		39	37.41
Alcohol Experience (1=yes; 0=no)		1,327	36.76		148	44.04		150	38.42		394	43.88		394	30.13		190	31.56		51	48.21
Drug Experience																					
Yes		86	2.89		30	10.79		26	7.89		11	1.32		8	0.49		6	1.21		5	4.88
No		2,997	78.89		258	74.98		287	74.13		753	80.88		1,125	81.95		479	74.82		95	78.71
DK		706	18.21		45	14.23		71	17.98		158	17.80		253	17.57		156	23.96		23	16.41
Sleep Satisfaction	3.09			3.05			3.17			3.12			3.13			2.89			3.04		
School Violence																					
Yes		168	4.77		49	14.71		37	9.83		33	3.77		28	1.65		14	2.40		7	6.63
No		3,161	82.69		231	66.88		291	74.55		766	84.12		1,190	86.01		578	90.05		105	83.04
DK		460	12.54		53	18.41		56	15.62		123	12.11		168	12.34		49	7.55		11	10.33
Total (*N*)		3,789			333			384			922			1,386			641			123	

Source: Korea Youth Risk Behavior Survey (KYRBS) (2011-2016)