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Factors Associated with Homosexual Adolescents in South Korea

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Purpose: The purpose of this study was to investigate factors related to homosexual adolescents in South Korea.
Methods: Using statistics from the 12th (2016) Korea Youth Risk Behavior Web-based Survey, hierarchical logistic regression analysis was conducted. The study sample comprised 65,528 middle and high school students aged 12 to 18 years.
Results: The significant predictors of homosexual intercourse were gender, attempted suicide, bullying at school experience, ever drinking, ever smoking, habitual or purposeful drug use, cohabitation with family, weekly allowance, and mother's education levels.
Conclusions: The results suggest that gender-related interventions should be considered in school health education programs and that sexual health interventions for high-risk groups may be needed, given the factors predicting homosexual intercourse.

Keywords: Adolescent; Education; Homosexuality

Introduction

Adolescence is a transitional stage in which important developmental growth tasks are performed, rapid body changes and emotional changes appear simultaneously, and sexual curiosity is very high [1-3]. When young people date, the degree of sexual acceptance is gradually increasing, and they can love each other and have sex if they want [3]. However, sexual intercourse, which means direct sexual intercourse, can negatively impact not only on the body but also mentally in adolescence, so healthy sexual behavior of current adolescents is very important for future adult health.

Sexual experiences in adolescence not only threaten genital health by increasing high-risk behaviors of developing teen's sexual experiences [4-6], deviating from adolescent developmental standards to other adolescent misconduct [7]. As such, adolescence is a critical time to form new social relationships, acquire interpersonal skills, form a sense of self-identity, values and beliefs, while simultaneously forming a gender identity that is not afraid of danger [8].

It has been reported that dangerous sexual attitudes and sexual behavior in adolescents with low health indicators increase the risk of disease and expose them to situations that can lead to STDs or to harm others' health through high-risk sexual activity [9,10]. In particular, younger homosexual and bisexual men showed more dangerous sexual infections than heterosexuals because this is associated with high-risk behaviors. [11-13]. Male adolescents who have homosexual relations lack self-esteem, and female adolescents are also associated with poor communication with parents [14], with regard to family background especially parental education level, higher educated parents were more accepting of homosexuality [15]. Furthermore, examining prior studies related to adolescents' homosexual experiences, adolescents with homosexual relationships are exposed to more violence in personal and social terms, and are more vulnerable to sexual self- management behaviors such as smoking, drinking,

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drugs, emotional depression and attempted suicide [16]. and the use of the health care system and economic level are also related to homosexual relations [17].

Korea Youth Risk Behavior Web-based Survey (KYRBWS) is the only national youth health statistics in Korea with national representation conducted under Article 19 of the National Health Promotion Act since 2005, as of 2016, it consists of 117 survey questions in 15 areas, such as smoking, drinking, obesity and weight control, physical activity, eating habits, damage prevention, sexual behavior, mental health, internet addiction, oral health, atopy and asthma, personal hygiene, drugs, health equity, violence. This statistical data including variables were used constantly for analysis of sexual behavior and explained in terms of various relationships with sexual behavior of adolescent in Korea [18-24]. However, there is currently no research on sexual behavior of homosexual adolescent in Korea with specific variables as considered above.

As such, adolescents' experiences of homosexual intercourse are thought to be variously affected at the levels of individual, family, school, and regional characteristics. However, few studies have examined adolescents' homosexual relationships, and most of these used limited samples and social and environmental factors. In addition, no studies have yet systematically analyzed the factors affecting the experience of homosexual intercourse among adolescents in Korea using a highly representative sample. Therefore, this study using the 12th Korea Youth Risk Behavior Web-based Survey (KYRBWS), which is highly representative, aimed to identify factors related to the homosexual intercourse of adolescents, to analyze the factors affecting homosexual intercourse at multiple levels, and to provide basic data for establishing a management strategy for the promotion of youth sexual health for prevention of high-risk behaviors such as drinking, suicide, depression, and drug use etc.

Methods

Study population and data collection

The Institutional Review Board (IRB) of the Centers for Disease Control and Prevention of Korea (KCDC) approved this study (2014-06EXP-02-p-A). Also, this article was confirmed that it was subject to IRB deliberation exemption from Korea national institute for bioethics policy (IRB No. P01-201712-22-006).

This cross-sectional study used data from the 12th Korea Youth Risk Behavior Web-based Survey (KYRBWS), an anonymous, internet-based and self-administered structured questionnaire. The KYRBWS was a nationwide survey on Korean adolescents aged 12-18 years conducted by the Korea Centers for Disease Control and Prevention; the Ministry of Health and Welfare. This survey was based on the Law for the Promotion of the Nation's Health, approved by the government since 2005, involved students from 400 middle schools and 400 high schools and evaluated the associations of smoking, drinking, obesity, eating habits, physical activity and sexual behavior with the health behavior in Korean adolescents. In particular, it can be said to be of great significance as the last and latest data that can confirm data on the experience of same-sex sexual intercourse in adolescents in Korea. The study was designed as a retrospective cohort study, conducted using a complex sample design, involving stratification, clustering, and multistage sampling. The data are described in detail at http://www.kdca.go.kr/yhs/home.jsp, including.

The 12th KYRBWS surveyed a total of 67,983 students in 2016, of whom 2,455 (4.6%) did not complete the questionnaire, and the remaining 65,528 (96.4%) formed the study participants.

Variables

Variables of homosexual experience were defined as the case of answering "sexual intercourse with the same sex" to the question "Choose everything you have experienced so far", the rest of them were defined as having no same sexual experience. Also, individual characteristics included gender, grade, academic achievement, attempted suicide, bullying at school experience, ever drinking, ever smoking, habitual or purposeful drug use. Family characteristics included cohabitation with family, perceived socioeconomic status, weekly allowance, father and mother's education levels, school characteristics included type of school and regional characteristics included dwelling location.

Statistics

The distribution of the characteristics among the study participants was analyzed according to gender, grade, academic achievement, attempted suicide, bullying at school experience, ever drinking, ever smoking, habitual or purposeful drug use and sex education by homosexual intercourse in adolescence. To confirm family, school, and regional status by homosexual experience, cohabitation with family, perceived socioeconomic status, weekly allowance, parent's education levels, type of school and location were analyzed using the chi-square test.

To illustrate the hierarchical study model, we conducted hierarchical logistic regression analysis to analyze the risk factors influencing adolescents' homosexual intercourse. Hierarchical regression analysis is used to show if the risk factors (individual

characteristics, family, school and regional characteristics) explain a statistically significant amount of variance in adolescents' homosexual intercourse according to Models I, II, III and IV. The first model (Model I) typically includes individual characteristics such as gender, grade, academic achievement, attempted suicide, bullying at school experience, ever drinking, ever smoking, habitual or purposeful drug use. All statistical tests were conducted using SPSS version 20 (SPSS Inc, Chicago,IL,USA). Statistical significance was set at the 5% level.

Results

General characteristics

The gender of the subjects was 51.6% male, and 48.4% female, and 50.8% high school students and 49.2% middle school students. Academic grades were 38.5% in the top, 33.1% in the bottom, and 28.4% in the order. Suicide attempts were 2.3%, bullying 2.3%, drinking experience rate 37.9%, smoking experience rate 14.5%, and habitual or purposeful drug use rate 0.8%. The percentage not living with their family was 5.0%, and the economic status was in the order of 47.4% for the middle, 37.0% for the top, and 15.6% for the bottom. The average annual allowance was less than 100,000 won for 95.9%, while those receiving more than 100,000 won were 4.1%. The level of education for fathers was 62% for university graduates, 35.2% for high school graduates, and 2.8% for middle school graduates. The mother education level was 55.1% for college graduates, 42.5% for high school graduates, and 2.3% for middle school graduates. The types of schools were 63.2% for coed school, 18.4% for male schools, and 18.4% for female schools. The residences for small and medium-sized cities were in the order of 48.3%, metropolitan city 44.3%, and provinces 7.4% (Tables 1, 2).

Homosexual experiences according to individual characteristics

Table 1 shows the results of analyzing the relationships between the experience of homosexual intercourse according to the individual characteristics of the subjects. All items of personal characteristics showed statistically significant differences with the homosexual intercourse. The rate of experience of homosexual intercourse was 1.2% for males and 0.6% for females, and 1.2% for high school students and 0.7% for middle school students. In academic performance, the upper and lower ranks were equal to 1.1%, and the middle rank was 0.7%. In the past 12 months, the

Table 1. Individual characteristics by homosexual experience in adolescence (N=65,528)

Contents		Homosexual intercourse in adolescence						χ^{2a}	p-value
		No		Yes		Total			
		n	%	n	%	n	%		
Total		64,939	99.1	589	0.9	65,528	100.0	-	-
Gender	Girl	31,539	99.4	186	0.6	31,725	48.4	67.51	< .001
	Boy	33,400	98.8	403	1.2	33,803	51.6		
Grade	7-9th	31,987	99.3	232	0.7	32,219	49.2	22.72	< .001
	10-12th	32,952	98.8	357	1.2	33,309	50.8		
Academic achievement	Excellent	24,967	98.9	272	1.1	25,239	38.5	22.62	< .001
	Average	18,506	99.3	120	0.7	18,626	28.4		
	Poor	21,466	99.0	197	1.0	21,663	33.1		
Attempted suicide	No	63,519	99.2	479	0.8	63,998	97.7	696.01	< .001
	Yes	1,420	92.8	110	7.2	1,530	2.3		
Bullying at school experience	No	63,633	99.3	387	0.7	64,020	97.7	2,705.93	< .001
	Yes	1,306	86.6	202	13.4	1,508	2.3		
Ever drinking	No	40,497	99.4	227	0.6	40,724	62.1	140.82	< .001
	Yes	24,442	98.5	362	1.5	24,804	37.9		
Ever smoking	No	55,691	99.4	326	0.6	56,017	85.5	435.14	< .001
	Yes	9,248	97.2	263	2.8	9,511	14.5		
Habitual or purposeful drug use	No	64,538	99.3	437	0.7	64,975	99.2	4,425.8	< .001
	Yes	401	72.5	152	27.5	553	0.8		

[a]Using a chi-square test.

Table 2. Family, School and Location characteristics by homosexual intercourse in adolescence (*N*=65,528)

Contents		Homosexual intercourse in adolescence						χ^{2a}	*p*-value
		No		Yes		Total			
		n	%	n	%	n	%		
Cohabitation with family	Yes	61,847	99.3	416	0.7	62,263	95.0	746.71	<.001
	No	3,092	94.7	173	5.3	3,265	5.0		
Perceived socioeconomic status	Affluent	23,968	98.8	276	1.2	24,244	37.0	107.92	<.001
	Average	30,896	99.4	160	0.6	31,056	47.4		
	Poor	10,075	98.5	153	1.5	10,228	15.6		
Weekly allowance ([b]KRW)	None-99,999	62,416	99.3	404	0.7	62,820	95.9	1116.22	<.001
	100,000 ≤	2,523	93.1	185	6.9	2,708	4.1		
Father's Education levels (n = 51,587)	Middle school	1,416	97.1	41	2.9	1,457	2.8	91.23	<.001
	High school	18,046	99.4	107	0.6	18,153	35.2		
	College	31,744	99.2	233	0.8	31,977	62.0		
Mother's Education levels (n = 52,357)	Middle school	1,192	97.3	33	2.7	1,225	2.3	79.12	<.001
	High school	22,150	99.4	122	0.6	22,272	42.5		
	College	28,657	99.2	203	0.8	28,860	55.1		
Type of school	Coed school	41,080	99.1	365	0.9	41,445	63.2	102.84	<.001
	Boy's school	11,846	98.4	186	1.6	12,032	18.4		
	Girl's school	12,013	99.6	38	0.4	12,051	18.4		
Location	Province	4,815	99.1	41	0.9	4,856	7.4	0.24	0.915
	city	31,341	98.9	285	1.1	31,626	48.3		
	Metropolitan	28,783	99.0	263	1.0	29,046	44.3		

[a]Using a chi-square test.
[b]KRW is South Korea's currency; won (1,000KRW=US$1).

experience of homosexual intercourse among those who attempted suicide was 7.2%, which was 9 times higher than that of non-experience of homosexual intercourse 0.8%. The rates of experience of homosexual intercourse who had bullying in school experience were 13.4%, nearly 20 times higher than in 0.7% of non-experience of homosexual intercourse. The incidence of experience of homosexual intercourse among ever drinking was 1.5%, which was twice as high as 0.6% in non-experienced, and 2.8% in experienced smokers was 4 times more than in non-experienced 0.6%.

The experience of homosexual intercourse among those who took habitual or purposeful drug use was 27.5%, which was significantly higher than that of the non-experienced of homosexual intercourse 0.7%.

Homosexual experiences according to family, school and regional characteristics

Table 2 shows the results of analyzing the relationships between the subject's family characteristics and the presence or absence of homosexual intercourse according to family, school and regional characteristics. All of the family and school characteristics showed statistically significant differences with the presence of homosexual intercourse, but not with regional characteristics. In the family characteristics, the rate of experience with homosexual intercourse was significantly higher in students who did not live with family members (5.3%) than in students who did (0.7%).

In economic status, the ratio was 1.5% in the lower, 1.2% in the top, and 0.6% in the middle. Non-cohabitation with family (13.8%) had significantly higher homosexual experience than family with cohabitation (1.8%). Father's education was high in middle school (2.9%), high school (0.6%), and university (0.8%), mother education was also followed by middle school graduation (2.7%), high school graduation (0.6%), and university graduation (0.8%). In the school type, male school (1.6%), coed school (0.9%), and female school (0.4%) showed significantly higher rates of homosexual experience in other types of schools than female schools.

Factors associated with the experience of homosexual adolescents.

Table 3 shows the results of the logistic regression analysis to identify factors relates with the experience of homosexual inter-

Table 3. Predictors of homosexual intercourse in adolescence according to Individual, Family, School and Location factors (*N*=65,528)

contents		Model I		Model II		Model III		Model IV	
		OR[b]	(95% CI)	OR[b]	(95% CI)	OR[b]	(95% CI)	OR[b]	(95% CI)
Gender (Girl)	Boy	2.02	(1.56-2.61)**	2.01	(1.55-2.61)**	1.74	(1.27-2.39)**	1.74	(1.27-2.39)**
Grade(7-9th)	10-12th	0.96	(0.76-1.23)	0.89	(0.69-1.14)	0.88	(0.68-1.13)	0.88	(0.68-1.13)
Academic achievement (Poor)	Excellent	1.24	(0.96-1.62)	1.09	(0.83-1.44)	1.08	(0.82-1.42)	1.08	(0.82-1.42)
	Average	0.90	(0.66-1.23)	0.93	(0.68-1.28)	0.93	(0.68-1.27)	0.93	(0.68-1.27)
Attempted suicide (no)	Yes	3.52	(2.43-5.09)**	3.16	(2.15-4.65)**	3.19	(2.17-4.69)**	3.18	(2.16-4.68)**
Bullying at school experience (no)	Yes	5.34	(3.85-7.40) **	3.91	(2.76-5.54)**	3.89	(2.74-5.53)**	3.91	(2.75-5.55)**
Ever drinking (no)	Yes	1.65	(1.28-2.14) **	1.60	(1.23-2.09)**	1.60	(1.23-2.08)**	1.61	(1.23-2.09)**
Ever smoking (no)	Yes	1.80	(1.37-2.36) **	1.60	(1.21-2.12)**	1.60	(1.21-2.11)**	1.60	(1.21-2.11)**
Habitual or purposeful drug use (no)	Yes	9.76	(6.56-14.53) **	6.81	(4.42-10.50)**	6.66	(4.31-10.28)**	6.68	(4.32-10.33)**
Cohabitation with family (yes)	No			1.76	(1.22-2.53)**	1.75	(1.21-2.53)**	1.77	(1.22-2.56)**
Perceived Socioeconomic status (poor)	Excellent			1.33	(0.93-1.91)	1.33	(0.93-1.90)	1.32	(0.92-1.89)
	Average			0.91	(0.63-1.32)	0.92	(0.63-1.33)	0.91	(0.63-1.32)
Weekly allowance	100,000 ≤			3.93	(2.94-5.25)**	3.92	(2.93-5.24)**	3.92	(2.93-5.24)**
Father's Education levels (College)	Middle school			1.44	(0.81-2.56)	1.44	(0.81-2.57)	1.47	(0.82-2.63)
	High school			0.79	(0.58-1.07)	0.79	(0.59-1.08)	0.80	(0.59-1.09)
Mother's Education levels (College)	Middle school			2.46	(1.39-4.35)**	2.44	(1.38-4.33)**	2.46	(1.39-4.37)**
	High school			0.96	(0.72-1.28)	0.95	(0.72-1.27)	0.96	(0.72-1.27)
Type of school (Girl's school)	Coed school					1.23	(0.77-1.97)	1.23	(0.77-1.97)
	Boy's school					1.51	(0.88-2.59)	1.50	(0.87-2.57)
Location (Province)	Metropolitan							1.36	(0.80-2.32)
	city							1.42	(0.84-2.40)
Nagelkerke R^2			0.14		0.17		0.17		0.17
Cox and Snell R^2			0.01		0.01		0.01		0.01

CI: Confidence interval. aKRW is South Korea's currency; won (1,000KRW = US$1).
[b]Odds ratio (OR) was calculated by multinomial logistic regression analysis. *$p < .05$, **$p < .001$.

course among adolescents. In Model 1, with only personal characteristics, gender, suicide attempt, school bullying, smoking, drinking, and drug use were statistically significant. In Model 2 with additional family characteristics, Model 3 with school characteristics, and Model 4 with regional characteristics, gender, suicide attempt, bullying experience at school, smoking experience, drinking experience, drug use, living with family, weekly allowance and mother education were statistically significant. Looking at the final model 4, in terms of personal characteristics, male students had 1.74 times the experience of homosexual intercourse experiences experience of homosexual intercourse (95% CI: 1.27-2.39). Students who had experienced suicide attempts in the last 12 months had 3.18 times more homosexual experience (95% CI: 2.16-4.68) than those who had not, and students who were bullied at school had a 3.91 times higher homosexual intercourse experience than those who were not (95% CI: 2.75-5.55). Compared to the non-experienced drinking persons, the inexperienced person drinking alcohol had 1.61 times the homosexual experience (95% CI: 1.23-2.09), and inexperienced smokers had 1.60 times the homosexual experience (95% CI: 1.21-2.11) compared to non-experienced smokers. Compared to adolescents who did not take drugs, adolescents who had taken drugs had 6.68 times more homosexual experience (95% CI: 4.32-10.33). In the family characteristics, compared to those who lived with their families, those who did not live with their families had 1.77 times (95% CI: 1.22-2.56) homosexual experience. Adolescents who had more than 100,000 won had more than 3.92 times (95% CI: 2.93-5.24) homosexual experience than the average allowance of less than 100,000 won per week. Adolescent's homosexual experience with a mother's educational background in middle school were 2.46 times higher (95% CI: 1.39-4.37) than mothers with a college education.

Discussion

This study used the 12th KYRBWS data to identify the degree of homosexual experience in Korean adolescents and to investigate the influence factors. In this study, male adolescents with the homosexual experience rate were 1.2%, and the female adolescents were 0.6%. Gender was identified as a factor influencing homosexual experience: male adolescents were 1.74 times higher than female. Studies [3,25] reported a higher rate of general sexual experience in male adolescents than in female, and also the infection rates of chlamydia, gonorrhea, and syphilis, which are typical sexually transmitted diseases (STDs), especially the spread of human immunodeficiency virus / acquired immunodeficiency syndrome (HIV / AIDS) as overwhelmingly higher through young men who have sex with men (YMSM) [26-28]. Analysis of the epidemiological data of HIV / AIDS-infected Koreans in the 2017 report on the status of HIV / AIDS in Korea [27] showed that infections occurred mostly due to sexual contact in the cumulative statistics of infection paths since 2006. According to the recent report on HIV / AIDS in 2017 by the Korea Centers for Disease Control and Prevention [27,29], the age of new infections continues to decrease, with 36 infected among adolescents aged 15-19 and 163 aged 20-24, with predictable negative consequences. In specific, the number of infected people continued to increase: 11,458 of the infected (92.8%) were male, with an average age of 40 (26.8%). In 2017, the largest age group of newly infected people was those in their 20s (33.1%), and 91.4% were male. This shows that the main route of HIV / AIDS infection in Korea is male sexual intercourse, and it has been reported that HIV / AIDS infection through young homosexual men is spreading in other countries [13,30-33].

As a result of this study, adolescents with excellent academic performance had a higher homosexual experience than those who did not, but logistic regression analysis did not show that academic performance was a factor influencing homosexual experience. However, Parkes et al. [14] reported that teens with homosexual partners were more religious and knowledgeable about sexual health, and were more likely to have advanced education, including the knowledge to protect themselves from sexual dangers from homosexual relationships. In addition, Planes et al. [34] reported that young female homosexuals are insensitive to HIV or STD infections and that they are sensitive to pregnancy concerns, but Agenor et al. [35], in a study of American adolescents, tended to not have prophylactic sexual behavior, indicating a high STI-like infection rate. The other way, higher educated parent in the United Kingdom showed more accepting of homosexuality, more parental religious denominations were less accepting it [15], therefore, homosexual behavior is influenced by cultural characteristics, and preventive sex education that considers cultural characteristics along with family background and socio-political characteristics is required [15]. However, it was confirmed as a result of the opposite that the low mother's education level is a factor influencing homosexual adolescent experience in our study. This can be inferred as a result of cultural differences at home and abroad.

In this study, smoking, drinking, drug experience, bullying, and suicide attempts among adolescents were factors influencing homosexual experience. In previous studies [36,37], smoking, drinking, and drugs are risk factors for adolescents' early sexual experience. Homosexual adolescents are also closely related to smoking, drinking, and drug experience [38] and have been reported to be highly associated with the potential for risky sexual activity, such as having sex with a large number of reckless partners [39]. Adolescents who perform these risky behaviors may experience rejection from family members or bullying from friends, leading to low self-esteem and high depression, and leading to other high-risk behaviors such as attempted suicide [7,40,41]. Therefore, in order to promote the health of adolescents, including sexual health, it is necessary to establish youth health education programs for their high-risk behaviors access to psychosocial problems such as drinking, drug use, depression, and suicide attempts etc.

Non-cohabitation with family has been shown to be an influencing factor of homosexual experience, and youths who are in a period of significant physical and emotional growth struggle to maintain close relationships with their parents for reasons such as separation of parents, runaway, and family dissolution, which are therefore interpreted as deviant behavior in the case of lack of supervision.

In our study, a group that receives a lot of pocket money (more than 100,000 won), was identified as the influence factor of homosexual relationship experience. According to the Korea Youth Policy Institute in 2019 [42], the average allowance per month of 15-18 years old was 287,958 won (71,990 won per week), but several articles have concluded that adolescents in the highest pocket money were more likely to be heavy smokers in ways including act of buying cigarettes, the level of addiction, and the intensity of smoking [43,44], also substantial amount of pocket money was related to higher engage in risky behaviors such as smoking, alcohol, binge drinking, drug use, and gambling [45].

On the other hand, the school type and region were not analyzed as influence factors of homosexual experience, but youths

communicated and shared information beyond the limitations of space and time centered on social network services (SNSs), so it can be expected that there are more opportunities to meet people who can have homosexual experience and sexual deviation. Therefore, it is necessary to develop and utilize sex education programs for sexual aberrations and homosexual acts of adolescents indiscriminately occurring in the cyber environment, simultaneously accompanied by institutional regulations at the national level.

It is meaningful that through the results of this study, a management strategy for the prevention of high-risk behaviors in homosexual adolescents was established, and evidence was provided for the development and application of sex education contents according to gender. Lastly, the limitations of this study are as follows. First, the original data used in the study were conducted by an online-based self-report questionnaire, and it is possible that youths did not respond honestly or faithfully to questions on sensitive issues such as sexual behavior. Second, the variables that explain various social factors were not included in the analysis. However, this study used the National Youth Health Statistics, KYRBWS, with a highly representative sample.

Conclusions

The results of this study provide the following implications. Considering the age at which adolescents begin to have homosexual intercourse, it is necessary to strengthen practical sex education for low to high grade students. In particular, health education program for psychosocial approaches should be provided according to gender as a clear guideline in the field of education. To this end, the government should support the policies to develop sex education data based on statistical data, and to prepare and utilize appropriate education methods for the establishment of sexual awareness, attitude and gender ethics for youth living in the cyber environment.

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Conflict of interest

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Authors' contributions

Jong Gun Kim contributed to conceptualization, data curation, formal analysis, funding acquisition, methodology, project administration, visualization, writing - original draft, review & editing, investigation, resources, software, supervision, validation.

Data availability

Please contact the corresponding author for data availability.

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