Screening for Depression and Suicidality in Adolescents: The Korean Annual Nationwide Survey

Jun-Won Hwang, MD, PhD, Jae-Won Kim, MD, PhD, Un-Sun Chung, MD, PhD, Hyun Ju Hong, MD, PhD, Bongseog Kim, MD, PhD

Depression is a major health problem among Korean youth. In Korean adolescents, depression often results in problems related to suicidal ideation and suicide attempts. The suicide rate is 4.7 per 100,000 in Korean youth ages 10 to 19 years and suicide is the leading cause of death in Korean adolescents ages 13 to 18 years.[1] Notably, the suicide rate in Korea seems to be one of the highest among Organization for Economic Cooperation and Development (OECD) countries. Academic achievement is considered a key to overall success and is viewed as a survival response in highly competitive societies such as Korea.[2] Therefore, considerable research attention has been paid towards the link between depression and Korean adolescents' subjection to academic pressure and stress by both themselves and their parents.[3] An adolescent's depression tends to increase as a they advance in grade level, and one fifth of Korean adolescents has thought about committing suicide, mainly due to academic stress.[3] This article aims to describe the systematic implementation of a depression screening and treatment program within secondary schools in Korea.

Prevalence of Depression in Korean Children and Adolescents

Until now, few studies have used *DSM* criteria to investigate the prevalence of major depressive disorder (MDD) in representative community samples of Korean children and adolescents. The 2005 Seoul Child and Adolescent Mental Health Survey obtained depression prevalence estimates for a sample of 1,645 children (811 girls) ages 6 to 12 years. This study employed the parent version of the Diagnostic Interview Schedule for Children (DISC-IV) and the Children's Depression Inventory (CDI) to assess for depression. Using the parent version of the DISC-IV, the estimated prevalence of MDD in this population was 0.1%. Results from the CDI, which assessed children's self-reported depression, revealed a 1.9% of prevalence of moderate to severe depressive symptoms.[4] Although there have been no reports of the prevalence of adolescent (13 and older) MDD based on *DSM* criteria, prevalence of depressive symptoms among Korean adolescents has been reported to be high. A Korean study using the Center for Epidemiologic Studies Depression Scale (CES-D) found that 17.4% of boys and 20.6% of girls reported experiencing a depressive mood.[5] Another study of Korean adolescents, using the CES-D, reported the prevalence of depression to be 11.1% in boys and 19.8% in girls.[6] According to a 2017 report of the 17th Korea Youth Risk Behavior Web-based Survey (KYRBWS), which is similar to the Youth Risk Behavior Surveillance System in the United States, 16.4% of male seventh graders, 21.4% of male tenth graders, 24.4% of female seventh graders, and 29.6% of female tenth graders answered positively on the survey item asking about depressed mood.[7]

Justification for the Annual Nationwide Survey

In collaboration with the Ministry of Education, members of the Korean Academy of Child and Adolescent Psychiatry (KACAP) have developed and revised mental health questionnaires for administration to children and adolescents within academic settings since 2003.[8,9] Prior to 2006, the act that dictated how health care was delivered at schools, the School Health Act, did not include screening and referral for mental health treatment. After 2006 it was revised, assigning this role to school principals. Following the School Health Act revisions, schools in a few districts in Seoul piloted mental health screening instruments developed by the KACAP.

In 2011, national attention was drawn to the topic of adolescent depression and suicide when a middle-

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school boy ended his life by jumping off the seventh floor of a building as a result of school bullying. For more than 6 months, 2 classmates had physically abused and humiliated him (eg, coercing him into playing online games in order to earn high score even when they were offline, forcing him to eat biscuits off the ground, etc.).[10] His suicide note, which detailed long-standing agony and helplessness, was shown on mass media; related reports continued for at least 3 months. The case came as a shock to many Koreans and highlighted a need for the government to address the issue of school bullying. At the time, members of the KACAP suggested that school bullying and suicide among adolescents could be linked to various mental illnesses affecting both victims and perpetrators. They further suggested the establishment of a mental health screening system in order to help adolescents talk about their adversities openly.

Based on prevailing notions of the relationships between bullying, mental illness, and suicide, school-based mental health screening for children and adolescents went from voluntary to mandatory in Korea in 2012. Derived from policies developed by Professor Yee-Jin Shin, a child and adolescent psychiatrist and former member of the National Assembly from 2012 to 2016, the Ministry of Education designated and funded 2 centers for policy research and implementation.

How We Performed the Annual Nationwide Survey

According to the School Health Act and the related enforcement rules and decree, all first, fourth, seventh, and tenth graders in Korea are required to undergo mental health screening. Parents of first and fourth graders complete the Personality and Mental Health Screening Questionnaire, version 2 (CPSQ-II), online from home. The CPSQ-II is comprised of an anxiety/depression subscale because these two constructs could not be separated through factor analysis. In addition, seventh and tenth graders rate themselves over a three-month period on the Adolescent Personality and Mental Health Problems Screening Questionnaire, version 3 (AMPQ-III), online from their schools.[11] Parental rating is not included in the AMPQ-III. The AMPQ-III consists of 62 items with 2 major domains, the Personality and the Mental Health Problems domains. Most items, except those regarding perceived physical or mental health status and willingness to referral, are scored using a 4-point Likert scale from 0 to 3. The correlation coefficient for the test-retest reliability was 0.92 and the Cronbach's alpha was 0.88. There are 38 items on the Mental Health Problems domain in the AMPQ-III, and 7 of these items comprise the Mood Problems subscale. Specific items include: 1) "I have often been sick here and there for no apparent reason." 2) "I had serious mood swings for no apparent reason." 3) "I felt everything was troublesome and boring." 4) "I worried before things actually happened." 5) "I become irritated when adults instruct me to do this and that." 6) "I felt like dying." 7) "I felt depressed or irritated for no apparent reasons." In addition, there were two items regarding suicidal ideation and planning in the Suicide Related subscale: 1) "I felt like dying." 2) "I devised a detailed plan to kill myself at least once." A score of 2 or more in the Suicide Related subscale score are regarded as at-risk for suicide. Such items may reflect diverse manifestation of depression and related comorbidities. At-risk students are identified using the total score obtained on the Mental Health Problems domain and on items relating to suicidal ideation. Students obtaining a high score on one subscale only (ie, a subscale associated with depression) are not considered to be at risk, due to limited resources available for nationwide mass screening and response required for positive screens.

Results for the 2014–2016 surveys can be found in Table 1, which showed that youth identified at risk were at 4.5% (2014), 3.2% (2015), 3.2% (2016). Of these youth were at risk, referral rates to regional hospitals and psychiatric outpatient clinics or external specialized institutes were at 68.9% (63,400/92,018), 70.3% (43,297/61,590), and 76.2% (46,930/61,588) from 2014-2016. In general, 58.5% of parents and 66.4% of teachers rated their overall satisfaction of the survey at more than 4 out of a total of 5 points.[12] Results of the 2017 survey can be found in Table 2.

Table 1. Mental Health Screening Results Using Adolescent Personality and Mental Health Problems Screening Questionnaire, Version 2 (AMPQ-II) From 2014 to 2016

Year	Total No. of First, Fourth, Seventh, and Tenth Graders	Participants N (%)	At-Risk for General Mental Health and Suicide N (%)	At-Risk for Suicide N (%)	Referral N (%)
2014	2,066,108	2,049,307 (99.2)	92,018 (4.5)	24,793 (1.2)	63,400 (3.1)
2015	1,924,727	1,910,031 (99.2)	61,590 (3.2)	15,398 (0.8)	43,297 (2.2)
2016	1,932,255	1,918,135 (99.3)	61,588 (3.2)	17,390 (0.9)	46,930 (2.4)

If children and adolescents' CPSQ-II or AMPQ-III scores exceed the threshold for identifying at-risk groups (screen positive), supplementary interviews are conducted by school counselors. Following this interview, final at-risk students are screened. During supplementary interview detailed history and a suicide risk assessment was performed. Among female students, 5.3% of seventh graders and 4.1 % of tenth graders reported positively; after the interview, these figures decreased to 2.8% and 2.5%, respectively.

What We Did After the Annual Nationwide Survey

The School-Community Cooperation Model for Students' Mental Health was implemented from 2013 to 2017. In this model, it is recommended that each regional Office of Education establish an intervention and referral system for at-risk students. Emphasis is placed not only on referral to mental health professionals outside schools, but also on public education. Further, early intervention programs (ie, for depression, The Jumping Blue,[13] which was based on the Adolescent Depression Awareness Program by Johns Hopkins University) were recommended for adolescents. In 2015, 38 seminars were held on adolescent depression and suicide by child and adolescent psychiatrists, in which 11,110 administrators from 11,621 schools participated. In the same year, student suicide had been at its lowest within the last 10 years. Many psychiatrists in the community took on roles as consulting psychiatrists in schools, whereas prior to that, they did not have the opportunity to actively participate in school-based mental health. In schools that adopted this model, teachers' awareness regarding school mental health resources (z=-2.39, p=0.017), school policy and practice (z=-3.972, p=0.0001), school climate (z=-2.076, p=0.038) increased compared with baseline.[14]

Despite these efforts, there were still unmet needs in the management of at-risk students due to social prejudice and family factors (economic problems, lack of awareness, etc.). Although overall referral rates were approximately 70% or more, still many at-risk students could not

Table 2. Mental Health Screening Results Using Adolescent Personality and Mental Health Problems Screening Questionnaire, Version 3 (AMPQ-III) in 2017

		Male		Female	
		Seventh Graders N (%)	Tenth Graders N (%)	Seventh Graders N (%)	Tenth Graders N (%)
Total Participants		231,112 (100.0)	267,452 (100.0)	215,197 (100.0)	247,185 (100.0)
Mood	T score ≥ 65	15,616 (6.8)	19,573 (7.3)	21,221 (9.9)	24,916 (10.1)
Problems subscale score	T score ≥ 70	11,140 (4.8)	14,175 (5.3)	11,621 (5.4)	13,422 (5.4)
Suicide-related subscale score	T score ≥ 70	7,627 (3.3)	8,024 (3.0)	11,405 (5.3)	10,135 (4.1)

visit regional hospitals and psychiatric outpatient clinics or specialized institutes outside their schools. In certain regions, because board-certified child and adolescent psychiatrist were not available, the referral was made to those in a distant region or those without experience treating children and adolescents. In addition, some parents of at-risk students rejected the referral because of their stigma toward mental health problems and economic burden. The Mental Health Professionals School Visit Project (2015–2019) was implemented to resolve these problems. During visitations to schools, a mental health professional team consisting of nurses, psychologists, social workers, and psychiatrists evaluated students' mental health through structured interviews with the students, teachers, and parents. Following team-based case meetings, wherein interventions were determined, the team revisited the schools and informed the relevant parties of each student's status (ie, his/her symptoms, signs, and outcomes of the suspected diagnosis) and proposed plans (ie, psychoeducation for parents and teachers, information regarding recommended treatments and relevant clinics, hospital, and institutes in the region, etc.). The team also helped with the referral of at-risk students to regional mental health professionals and provided economic support as needed. Students who were referred from schools had emotional problems including depression (26.7%), behavioral problems such as attention-deficit/hyperactivity disorder (ADHD) (23.6%), interpersonal problems (18.1%), and family environmental problems (11.2%). ADHD was the most common provisional diagnosis (30.1%), followed by depression (22.8%).[15]

Take Home Summary

The Korean government recently implemented nationwide policies based on mental health perspectives. 4.8%-5.4% of seventh and tenth graders screened positive for mood symptoms on the AMPQ-III in 2017. Evidence-based programs for depression and suicide prevention in adolescents should be developed.

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About the Authors

Jun-Won Hwang, MD, PhD, is a professor in the Department of Psychiatry, Kangwon National University School of Medicine, Korea. He is a pediatric psychiatrist with an interest in child abuse and suicide.

Jae-Won Kim, MD, PhD, is a professor in the Division of Child and Adolescent Psychiatry, Department of Psychiatry, Seoul National University College of Medicine, Korea. He is interested in child depression and anxiety.

Un-Sun Chung, MD, PhD, is a professor in the Department of Psychiatry, Kyungpook National University School of Medicine, Korea. She is a pediatric psychiatrist with an interest in child trauma.

Hyun Ju Hong, MD, PhD, is a professor in the Department of Psychiatry, Hallym University College of Medicine, Korea. She is a pediatric psychiatrist with an interest in school mental health.

Bongseog Kim, MD, PhD, is a professor in the Department of Psychiatry at the University of Inje College of Medicine, Korea. He is a pediatric psychiatrist with an interest in attention-deficit/hyperactivity disorder.

Disclosure: Drs. Hwang, J. Kim, Chung, Hong, and B. Kim have reported no biomedical financial interests or potential conflicts of interest.

This article was edited by Jessica Jeffrey, MD, MPH, MBA.