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ARTICLE

Pills as Aids? Substance Use, School Satisfaction, Sleep Quality, Body Image, and Mental Well-Being Among Korean Adolescents

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ABSTRACT: Background: With growing concerns about the abuse of prescription and over-the-counter (OTC) medications, such as medications for attention-deficit/hyperactivity disorder (ADHD), diet pills, and sleep aids, among adolescents in South Korea, this study aimed to investigated how these substances affect key aspects of adolescent well-being, specifically school satisfaction, body image, and sleep quality, and their association with mental health outcomes. **Methods**: A two-wave longitudinal survey was conducted with Korean female high school students (Wave 1: $n = 494$; Wave 2: $n = 189$). Linear regression analyses were used to evaluate the effects of ADHD medications, diet pills, and sleep aids on changes in school satisfaction, body image, and sleep quality, respectively. We also examined the relationship between these outcomes and mental health indicators, including depression, anxiety, stress, and somatic symptoms. **Results**: In line with the Self-Medication Hypothesis, which suggests that substances may fail to alleviate stress or improve well-being, the use of ADHD medications was associated with a decrease in school satisfaction, diet pill use was not significantly associated with changes in body image, and sleep aid use was not significantly associated with changes in sleep quality. Poor school satisfaction, body image, and sleep quality were associated with negative mental health outcomes. **Conclusion**: These findings suggest that ADHD medications, diet pills, and sleep aids may not effectively improve school satisfaction, body image, or sleep quality, and could potentially exacerbate mental health challenges.

KEYWORDS: Adolescents; substance use; mental health; self-medication; coping strategies

1 Introduction

The abuse of prescription and over-the-counter (OTC) medications, which refers to using these substances for non-medical purposes, has become an increasingly significant public health issue, particularly among young people [1]. In the United States, for instance, 11% of high school seniors report non-medical use of prescription drugs [2], while in South Korea, 17% of adults are reported to have abused prescription drugs continuously [3]. This emerging trend of substance misuse poses serious risks, not only to physical health but also to psychological well-being.

A growing body of research has demonstrated a robust association between the abuse of prescription and OTC medications and psychological distress. For example, it was found that young adults who used OTC medications without medical supervision exhibited higher levels of hopelessness and more pronounced symptoms of depression, anxiety, and somatic distress, compared to their peers who did not engage in such misuse [4]. Similarly, research found that college students engaged in non-medical prescription drug use experienced increased depressive symptoms and greater general disinhibition over time [5].

While the connection between the abuse of prescription and OTC medications and mental well-being is well-documented, less is known about the underlying reasons for this association. This knowledge gap is especially concerning when considering adolescents, who are particularly vulnerable to mental health challenges due to the unique pressures they face. Adolescents often experience substantial academic and social stress, which can increase their susceptibility to mental health issues such as anxiety and depression [6]. Moreover, social challenges, including both in-person and online bullying, can further exacerbate these difficulties [7]. As suicide rates continue to rise globally, with a particularly notable increase among young people [8], addressing adolescent mental health issues has become increasingly urgent. Understanding how the misuse of prescription and OTC medications affects mental well-being can play a critical role in this effort, as it can help inform the development of more effective prevention strategies for substance use and its associated mental health risks.

Research suggests that young people often misuse prescription and OTC medications as a coping strategy for managing stress from daily life [9]. According to the Transactional Model of Stress and Coping [10], individuals' appraisal of stressful situations influences their choice of coping strategies, which, in turn, affects both short-term stress management and long-term mental well-being. While adaptive coping mechanisms can foster emotional resilience, maladaptive strategies, such as substance misuse, may offer only temporary relief and can exacerbate long-term distress. This dynamic is reflected in the Self-Medication Hypothesis [11], which argues that individuals may turn to substances like alcohol and drugs to alleviate psychological discomfort. However, such substances often provide only transient relief, failing to address the underlying causes of distress. Over time, this reliance can impede the development of one's own coping capacities and ultimately harm mental well-being [11,12].

In South Korea, medications for attention-deficit/hyperactivity disorder (ADHD), diet pills, and sleep aids are increasingly used by adolescents to cope with the stress related to academic performance, body image, and sleep difficulties. The country's highly competitive education system places significant pressure on students to excel academically, prompting some to use ADHD medications, such as methylphenidate, to enhance concentration and academic performance [13]. Meanwhile, pervasive media influence and societal expectations surrounding body image have led many adolescents—particularly females—to use diet pills in pursuit of rapid weight loss, despite regulations restricting access for those under 16 [14–16]. In addition, widespread sleep deprivation caused by long study hours and excessive screen time has contributed to an increase in the sleep aids usage [17–19]. However, as the Self-Medication Hypothesis suggests, while these substances may offer temporary relief, they often may fail to address the root causes of distress, leading to a cycle of dependence that ultimately exacerbates mental health issues.

The current study seeks to explore the effectiveness of ADHD medications, diet pills, and sleep aids in managing stress related to school life, body image, and sleep quality, and their association with negative mental health outcomes. Specifically, we examine how the use of these substances influences school satisfaction, body image, and sleep quality, respectively (**RQ1**), and how these factors are linked to depression, anxiety, stress, and somatic symptoms (**RQ2**). By testing these relationships, the study aims to gain insight into the role of substance use as a coping strategy and its potential to exacerbate mental health challenges among adolescents.

2 Methods

2.1 Participants and Data Collection Procedure

We conducted a two-wave panel survey in Korea. A total of 494 Korean female high school students participated in the first wave of the survey conducted in February 2024. Of these, 189 students completed the second wave in May 2025. Only participants who completed both waves were included in the final

dataset, except for the additional analyses for **RQ2**, which used data from Wave 1 only. An a priori sample size calculation was not performed. Rather, the sample size was determined pragmatically, as we recruited the maximum number of participants feasible given the available resources and the survey company's panel capacity. The sample consisted solely of female students, a decision made deliberately given the study's focus on diet pill use, a behavior more commonly reported among female adolescents. The limitation of this decision is further discussed in the Discussion section. Table 1 presents the participant characteristics. All participants completed the questionnaire through an online survey administered by the Korean survey company, Macromill Embrain, which recruited participants from its national panel pool. Respondents were required to answer all questions to be included in the analyses. This study was approved by the Ewha Womans University Institutional Review Board (Approval Number: ewha-202204-0022-01), and informed consent was obtained from all participants.

The survey was initially developed in English, and a Korean version was created through translation and back-translation by two bilingual individuals fluent in both English and Korean, who were blind to the hypothesis and research questions. Any discrepancies between the versions were reviewed and resolved in consultation with the authors. Participants completed the survey in Korean.

Table 1: Socio-demographic characteristics of the sample.

Characteristics	Wave 1	Wave 2
	***Mean* (*SD*) or *n* (%)**	***Mean* (*SD*) or *n* (%)**
Age	16.58 (1.15)	17.79 (1.06)
Parental marital status		
Married	403 (81.6%)	142 (76.3%)
Others	91 (18.4%)	44 (23.7%)
Parental education[a]	3.56 (1.16)	3.60 (1.02)
Academic achievement[b]	3.89 (1.54)	3.72 (1.39)
Body Mass Index (BMI)	20.97 (3.60)	21.54 (4.62)
Alcohol use		
User	99 (20.0%)	73 (39.2%)
Non-user	395 (80.0%)	113 (60.8%)
Tobacco use		
User	32 (6.5%)	22 (11.8%)
Non-user	462 (93.5%)	164 (88.2%)

Note: [a]: 1 = 'primary school graduate or less', 5 = 'graduate school graduate or professional degree'. [b]: 1 = 'below 50', 6 = 'above 90'.

2.2 Measurements

The use of ADHD medications, sleep aids, and diet pills was measured by asking respondents whether they had used ADHD medications, sleep aids, and diet pills in the past month, respectively (0 = no, 1 = yes).

Levels of depression (Wave 1: *Mean* = 1.19, *SD* = 0.84, α = 0.94; Wave 2: *Mean* = 1.09, *SD* = 0.81, α = 0.93), *anxiety* (Wave 1: *Mean* = 0.64, *SD* = 0.72, α = 0.91; Wave 2: *Mean* = 0.62, *SD* = 0.70, α = 0.91), and stress (Wave 1: *Mean* = 1.28, *SD* = 0.83, α = 0.91; Wave 2: *Mean* = 1.19, *SD* = 0.85, α = 0.93) were measured using the Depression Anxiety Stress Scales-21 (DASS-21) [20] on a 4-point scale (0 = not at all to 3 = very often).

Somatic symptoms were measured by asking respondents whether they had experienced the following problems in the past month (0 = no, 1 = yes): frequent headaches/migraines, sleep disturbances, eating disorders (anorexia, bulimia), and frequent abdominal pain. Items were adapted from previous health symptom checklists used in adolescent mental health surveys (e.g., WHO's HBSC symptom checklist) [21]. Responses were summed to create an index (Wave 1: *Mean* = 1.15, *SD* = 1.04; Wave 2: *Mean* = 1.05, *SD* = 0.99).

School satisfaction was measured using four items adapted from previous research on school well-being and student engagement [22]: (1) "How much you like school" (1 = not at all to 5 = very much), (2) "How often you feel that what you are asked to do at school is meaningful and important" (1 = never to 5 = always), (3) "How interesting most of your classes are" (1 = very boring to 5 = very interesting), and (4) "How satisfied are you with your overall school experience" (1 = very unsatisfied to 5 = very satisfied). An index was computed by averaging the scores of the four items (Wave 1: *Mean* = 3.01, *SD* = 0.84, α = 0.84; Wave 2: *Mean* = 2.98, *SD* = 0.85, α = 0.84).

Body image was assessed using items adapted from the Body Shape Satisfaction Scale [23] and similar body satisfaction measures used in adolescent health research. Respondents rated their satisfaction with various body parts, including their height, weight, body, waist, hip, thigh, abdomen, face, physique, and shoulder (1 = very unsatisfied to 5 = very satisfied). An index was calculated by averaging the item scores (Wave 1: *Mean* = 2.72, *SD* = 0.77, α = 0.90; Wave 2: *Mean* = 2.66, *SD* = 0.81, α = 0.93).

Sleep quality was measured by asking respondents to rate how often they slept well enough over the past week (0 = not at all to 3 = often; Wave 1: *Mean* = 1.61, *SD* = 1.00; Wave 2: *Mean* = 1.41, *SD* = 0.96). The item was adapted from the Pittsburgh Sleep Quality Index (PSQI) [24].

2.3 Statistical Analysis

First, to examine how the use of ADHD medications, diet pills, and sleep aids predicted the changes in school satisfaction, body image, and sleep quality (**RQ1**), we conducted a series of linear regression analyses using SPSS v.27 (IBM Corp., Armonk, NY, USA). The use of ADHD medications, diet pills, and sleep aids in Wave 1 were entered as predictors, with the changes in school satisfaction, body image, and sleep quality between Wave 1 and Wave 2 as the dependent variable, respectively. Covariates included age, parental marital status, parental education, alcohol use, and tobacco use. Academic achievement was included as a covariate for school satisfaction, and BMI was included as a covariate for body image.

Next, to test how school satisfaction, body image, and sleep quality were associated with depression, anxiety, stress, and somatic symptoms (**RQ2**), we conducted another series of linear regression analyses using the dataset from Wave 2. School satisfaction, body image, and sleep quality were entered as independent variables, while depression, anxiety, stress, and somatic symptoms served as the dependent variables, respectively. Covariates included age, parental marital status, parental education, academic achievement, BMI, alcohol use, tobacco use, and the use of ADHD medications, diet pills, and sleep aids. Given the cross-sectional nature of the analyses, we also repeated the analyses using the dataset from Wave 1.

3 Results

For **RQ1**, the results (see Table 2) indicated that the use of ADHD medications was marginally significantly associated with a decrease in school satisfaction (b = −0.59, SE = 0.30, p = 0.051). After controlling for relevant covariates, it accounted for an additional 2% of the variance in the change in school satisfaction (ΔR^2 = 0.02). In contrast, diet pill use was not significantly associated with changes in body image (b = 0.05, SE = 0.17, p = 0.77), and sleep aid use was not significantly associated with changes in sleep quality (b = 0.10, SE = 0.38, p = 0.80).

For **RQ2**, the results (see Table 3) revealed that in Wave 2, school satisfaction, body image, and sleep quality were negatively associated with depression, explaining an additional 21% of the variance after controlling for the covariates (ΔR^2 = 0.21). School satisfaction and body image were negatively associated with anxiety, accounting for an additional 12% of the variance (ΔR^2 = 0.12). Body image and sleep quality were negatively associated with stress, explaining an additional 8% of the variance (ΔR^2 = 0.08).

Table 2: Effect of substance use on school satisfaction, body image, and sleep quality.

Characteristics	ΔSchool Satisfaction			ΔBody Image			ΔSleep Quality		
	b	*SE*	*p*	*b*	*SE*	*p*	*b*	*SE*	*p*
Covariates									
Age	−0.05	0.06	0.34	0.04	0.04	0.34	0.13	0.09	0.12
Parental marital status	0.11	0.14	0.41	0.04	0.10	0.69	0.21	0.22	0.34
Parental education	−0.01	0.06	0.89	−0.004	0.04	0.92	−0.14	0.09	0.10
Academic achievement	−0.02	0.04	0.58	–	–	–	–	–	–
Body Mass Index (BMI)	–	–	–	−0.01	0.01	0.66	–	–	–
Alcohol use	0.001	0.14	0.99	−0.06	0.10	0.56	**0.51**	**0.22**	**0.021**
Tobacco use	−0.13	0.27	0.64	0.19	0.20	0.33	0.06	0.46	0.90
Predictors									
ADHD medications use (W1)	−0.59	0.30	0.051	–	–	–	–	–	–
Diet pills use (W1)	–	–	–	0.05	0.17	0.77	–	–	–
Sleep aids use (W1)	–	–	–	–	–	–	0.10	0.38	0.80
Total R^2		0.04			0.01			0.06	

Note: Dashes (—) indicate variables not included in the model. Results with significant *p*-values ($p < 0.05$) are bolded.

Table 3: Associations between school satisfaction, body image, sleep quality and mental health outcomes (W2).

Characteristics	Depression			Anxiety			Stress			Somatic Symptoms		
	b	*SE*	*p*	*b*	*SE*	*p*	*b*	*SE*	*p*	*b*	*SE*	*p*
Covariates												
Age	−0.02	0.06	0.80	0.03	0.05	0.64	0.02	0.07	0.79	−0.11	0.08	0.19
Parental marital status	−0.01	0.12	0.96	−0.07	0.11	0.56	−0.06	0.14	0.66	−0.30	0.17	0.08
Parental education	−0.05	0.06	0.33	−0.09	0.05	0.06	−0.01	0.06	0.90	0.01	0.08	0.92
Academic achievement	−0.03	0.04	0.44	0.03	0.04	0.37	−0.03	0.05	0.53	−0.03	0.06	0.56
Body Mass Index (BMI)	**−0.03**	**0.01**	**0.011**	**−0.03**	**0.01**	**0.003**	−0.03	0.01	0.06	−0.02	0.02	0.24
Alcohol use	0.05	0.13	0.72	−0.15	0.12	0.23	−0.15	0.15	0.30	0.22	0.19	0.24
Tobacco use	−0.30	0.19	0.13	−0.15	0.17	0.38	−0.17	0.22	0.45	0.14	0.27	0.61
ADHD medications use	−0.06	0.25	0.81	−0.13	0.23	0.58	−0.16	0.28	0.58	0.08	0.35	0.83
Diet pills use	0.22	0.26	0.39	0.38	0.23	0.10	0.48	0.29	0.10	−0.18	0.36	0.61
Sleep aids use	0.43	0.22	0.06	**0.58**	**0.20**	**0.005**	**0.53**	**0.25**	**0.037**	0.31	0.31	0.32
Predictors												
School Satisfaction	**−0.21**	**0.07**	**0.003**	**−0.20**	**0.06**	**0.002**	−0.15	0.08	0.06	−0.15	0.10	0.14
Body Image	**−0.37**	**0.07**	**<0.001**	**−0.22**	**0.07**	**0.001**	**−0.29**	**0.08**	**<0.001**	−0.16	0.10	0.13
Sleep Quality	**−0.11**	**0.05**	**0.043**	−0.02	0.05	0.64	**−0.12**	**0.06**	**0.050**	−0.13	0.07	0.08
Total R^2		0.35			0.30			0.26			0.14	

Note: Results with significant *p*-values ($p < 0.05$) are bolded.

In Wave 1 (see Table 4), school satisfaction and sleep quality were negatively associated with depression, explaining an additional 9% of the variance after controlling for covariates ($\Delta R^2 = 0.09$). School satisfaction was negatively associated with stress, accounting for an additional 3% of the variance ($\Delta R^2 = 0.03$).

Table 4: Associations between school satisfaction, body image, and sleep quality and mental health outcomes (W1).

Characteristics	Depression			Anxiety			Stress			Somatic Symptoms		
	b	*SE*	*p*	*b*	*SE*	*p*	*b*	*SE*	*p*	*b*	*SE*	*p*
Covariates												
Age	−0.002	0.06	0.97	−0.03	0.05	0.55	−0.01	0.06	0.94	−0.07	0.08	0.37
Parental marital status	**0.27**	**0.13**	**0.046**	0.03	0.11	0.77	0.02	0.15	0.91	−0.08	0.19	0.66
Parental education	0.003	0.06	0.95	0.03	0.05	0.66	0.02	0.06	0.75	**0.18**	**0.08**	**0.018**
Academic achievement	0.04	0.04	0.32	−0.04	0.03	0.31	−0.04	0.05	0.38	−0.09	0.06	0.11
Body Mass Index (BMI)	0.03	0.02	0.10	0.01	0.01	0.30	0.02	0.02	0.32	−0.02	0.02	0.39

Table 4: *Cont.*

Characteristics	Depression			Anxiety			Stress			Somatic Symptoms		
	b	***SE***	***p***	***b***	***SE***	***p***	***b***	***SE***	***p***	***b***	***SE***	***p***
Covariates												
Alcohol use	0.08	0.14	0.54	−0.02	0.11	0.89	−0.05	0.16	0.73	0.12	0.19	0.52
Tobacco use	0.06	0.28	0.82	−0.35	0.23	0.13	−0.03	0.32	0.93	−0.04	0.39	0.91
ADHD medications use	−0.49	0.30	0.11	**−0.59**	**0.25**	**0.017**	−0.64	0.35	0.07	−0.70	0.41	0.09
Diet pills use	−0.35	0.24	0.15	−0.20	0.19	0.30	−0.45	0.27	0.10	−0.26	0.33	0.43
Sleep aids use	−0.08	0.24	0.74	0.14	0.20	0.48	0.15	0.28	0.58	−0.55	0.33	0.10
Predictors												
School Satisfaction	**−0.27**	**0.07**	**<0.001**	−0.09	0.06	0.15	**−0.21**	**0.09**	**0.016**	0.01	0.10	0.96
Body Image	−0.15	0.10	0.14	−0.10	0.08	0.23	−0.13	0.12	0.27	−0.13	0.14	0.35
Sleep Quality	**−0.10**	**0.05**	**0.032**	−0.02	0.04	0.53	−0.07	0.05	0.22	−0.03	0.06	0.60
Total R^2		0.18			0.10			0.10			0.11	

Note: Results with significant p-values ($p < 0.05$) are bolded.

4 Discussion

4.1 Key Findings

This study examined how the use of these substances influences school satisfaction, body image, and sleep quality, respectively (**RQ1**), and how these factors are linked to mental health outcomes (**RQ2**).

For **RQ1**, we found that the use of ADHD medications, diet pills, and sleep aids did not lead to improvements in school satisfaction, body image, or sleep quality. Specifically, the use of ADHD medications was associated with a decrease in school satisfaction. This may be due to the fact that, although these medications can enhance concentration and academic performance in the short term, prolonged use could increase pressure to sustain high performance, potentially resulting in academic burnout and reduced satisfaction with school life. In contrast, diet pills use was not significantly associated with changes in body image. Adolescents who use diet pills in an effort to lose weight may still experience body dissatisfaction, as the effects of these pills are often temporary, with weight commonly being regained after discontinuation [25]. Moreover, the use of diet pills may reinforce distorted perceptions of body image, contributing to persistent dissatisfaction. Similarly, the use of sleep aids was not significantly associated with changes in sleep quality, suggesting that these substances may not effectively alleviate sleep disturbances. Although sleep aids can offer temporary relief, habitual reliance may disrupt natural circadian rhythms and ultimately diminish overall sleep quality [26].

As for **RQ2**, we found that school satisfaction, body image, and sleep quality were associated with negative mental health outcomes, such as depression, anxiety, and stress. These factors significantly influence overall psychological well-being, as they are integral to adolescents' lives. School satisfaction, for example, reflects adolescents' perceptions and evaluations of their overall school experiences. It is a key component of general life satisfaction and, therefore, acts as a significant factor in subjective well-being [27]. Meanwhile, during puberty, adolescents undergo significant physical changes, making *body image* satisfaction especially important. Negative body image can profoundly affect mental health and behavior, particularly among girls [28]. Additionally, sleep quality is also a well-recognized predictor of mental health, given its pivotal role in emotional regulation and cognitive functioning [29]. The associations of school satisfaction, body image, and sleep quality with mental health outcomes underscore the importance to address these factors to promote adolescents' mental well-being.

It is worth noting that the associations varied across two waves. These differences may be attributed to the changing developmental stage of adolescents. Respondents who were in their third year of senior high school during Wave 1 had already entered university by Wave 2, while those in their third year of

junior high school during Wave 1 had transitioned to senior high school by Wave 2. As adolescents age and progress academically, their experiences, academic pressures, and surrounding environments change, which may explain why school satisfaction, body image, and sleep quality have become more central to their mental well-being.

Previous studies in South Korea have explored the relationship between substance use and mental health. However, these studies often grouped prescription and OTC medication use together with illicit drugs like marijuana, cocaine, and hallucinogens [30], making it difficult to isolate the unique effects of prescription and OTC medications. This oversimplification may overlook the distinct risks posed by these substances, which can be even more harmful than illicit drugs due to their greater accessibility, lower legal stigma, and the widespread perception that they are relatively safe [31]. Our research contributes to understanding the impact of prescription and OTC medication abuse in South Korea by specifically examining the negative effects of ADHD medications, diet pills, and sleep aids, substances that are increasingly being abused by adolescents in this context.

4.2 Practical Implications

This study offers important practical implications for promoting adolescents' mental health and preventing the misuse of prescription and OTC medications. Coordinated efforts among health agencies, schools, and families are essential to reduce adolescents' misuse of these substances. Health agencies should integrate regular screening of prescription and OTC medication use into public health surveillance systems to more accurately capture current trends. For example, the Korea Youth Risk Behavior Survey, which currently lacks data on substance use, should include items assessing the use and misuse of these medications. Similarly, the Youth Risk Behavior Survey by the U.S. Centers for Disease Control and Prevention (CDC) should broaden its scope beyond prescription opioids to encompass a wider range of commonly misused medications.

Schools play a critical role in prevention and should incorporate mental health and medication-use education into their curricula. These programs should provide students with accurate information about the risks associated with medication misuse and promote healthier coping strategies for managing stress. In light of our findings that adolescent use of diet pills and sleep aids was not associated with improvements in body image or sleep quality, educational initiatives should explicitly communicate that such products are unlikely to yield the intended benefits. Correcting these misperceptions of efficacy is key to reducing demand.

Parental oversight is also crucial. Healthcare providers should educate parents about the risks associated with the misuse of ADHD medications, diet pills, and sleep aids among adolescents. In South Korea—where ADHD medications are frequently framed as "study pills" [32]—minors accounted for 37.6% of non-reimbursed stimulant prescriptions [33]. Because non-reimbursed prescribing to minors typically occurs with parental awareness or consent, this pattern cautiously suggests that parental misconceptions about ADHD medication may also be contributing to the issue. Building on our finding that ADHD medication use is negatively associated with school satisfaction, parent-directed counseling should communicate this evidence to encourage appropriate, supervised use in the home.

In addition, health agencies should implement targeted public health campaigns to inform adolescents about the risks and realities of ADHD medications, diet pills, and sleep aids. One example could be a "Get the Facts about Medication" campaign designed specifically for adolescents. To be effective, such campaigns must go beyond generic warnings. They should employ accessible, relatable messaging delivered through platforms familiar to youth—such as social media, school events, and youth influencers—to address why these substances may appear appealing and to debunk common myths. Key messages might include statements such as: "Taking sleeping pills without a doctor's guidance can actually make your sleep worse".

4.3 Limitations and Future Research

Several limitations of the present study should be noted. First, although the two-wave panel design strengthens causal inference between the use of these substances and their outcomes, including school satisfaction, body image, and sleep quality, the relatively high attrition rate (38% completion at Wave 2) represents a significant limitation. The reduced sample size due to attrition limits the statistical power to detect significant effects. Additionally, participant loss may introduce bias and affect the representativeness of the findings, potentially compromising the generalizability of the results. We compared the participants who dropped out with those who remained and found no significant differences in initial levels of substance use, school satisfaction, body image, or sleep quality. Future research should improve retention rates and employ larger samples to validate these findings and provide more robust conclusions.

Second, the associations of school satisfaction, body image, and sleep quality with mental health outcomes were examined using data from Wave 2. Although we conducted additional analyses using Wave 1 data to test the consistency of our findings, the cross-sectional nature of this analysis limits the ability to draw causal inferences. Future studies should aim to establish clearer causal pathways among these factors.

Third, the present study relied on self-reported measures, which are subject to social desirability bias, particularly regarding sensitive behaviors like substance use. In Confucian societies, such as South Korea, where values like shame and secrecy are emphasized, these biases may be further heightened. Future research should incorporate additional data sources to validate self-reported data.

Another limitation of this study is the use of a single-item scale to assess sleep quality. Although this approach has been shown to be valid and reliable in previous studies [34,35], it may not fully capture the multidimensional nature of sleep quality. Future research could address this limitation by employing multi-item measures.

Finally, this study focused exclusively on female adolescents. While this approach allowed for a more targeted examination of the issue, it limits the generalizability of the findings to male adolescents. Previous research indicates that motivations for using prescription and OTC medications can differ significantly by gender [36]. Given these gender differences, future research should explore how the relationship between substance use and mental well-being may vary across genders.

Taken together, our findings suggest that the use of prescription and OTC medications—when not for their intended clinical purposes but instead as coping mechanisms for stress related to academics, body image, or sleep—often fails to alleviate distress and may, in fact exacerbate psychological strain. This study contributes to the growing body of research on the negative impact of prescription and OTC medication misuse, highlighting its detrimental effects on mental health. Our results underscore the need for greater awareness of, and intervention targeting, the non-clinical use of these substances as coping strategies.

5 Conclusions

This study found that the use of ADHD medications was associated with a decrease in school satisfaction, whereas diet pill use was not significantly associated with changes in body image, and sleep aid use was not significantly associated with changes in sleep quality. Poor school satisfaction, body image, and sleep quality were linked to negative mental health outcomes. These findings underscore that prescription and OTC medications may not always lead to improved outcomes when used as coping strategies for daily stress, and may, in turn, worsen mental well-being. Accordingly, to protect adolescents' mental health, it is crucial to focus on developing healthy coping skills to manage daily stress, rather than relying solely on medications.

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