

# Tests, Peer Pressure, And Mental Health in Adolescents

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## ABSTRACT

In the last few decades, high school students have reported high levels of mental illness including depressive symptoms and anxiety. However, it is not fully understood whether test numbers will have influences on their mental health. Moreover, peer pressure and stress may also have impacts on students' mood states. In the current study, we examined how tests and peer pressure associated with mental health of students in a high school in New York. We found sex differences in some mental health measures. Specifically, other genders showed more severe symptoms as compared to boys and girls, which may partly result from uneven sample sizes. We also identified significant associations of tests with somatic complaints and stress. In addition, we linked higher levels of peer pressure to more severe depressive, anxious, and somatic problems, and more sleep dysfunctions. These findings collectively suggest potential causes of mental illness in high school students, which have implications in the mechanisms underlying psychiatric disorders.

## Introduction

Many different high schoolers have expressed dissent over their grades and how strenuous the school curriculum, specifically the number of tests that they have to take every day are. Previous studies have demonstrated the negative correlations of grade point average (GPA) with depressive symptoms, stress, and anxiety (Fröjd et al., 2008; Pascoe et al., 2020). Specifically, about 66% of students in a high school reported feeling stressed due to academic pressure (Deb et al., 2015), and 32.6% of the students within the school have had some sort of mental illness: in a school where stress and anxiety is on the rise due to academic pressure, there is no surprise that mental illness will arise. Some factors that induce higher levels of stress in adolescents recorded by a study include parental and peer pressure (Coward, 2018). However, it remains unclear how test numbers affect the mental health of high schoolers.

Peer pressure is one of the main factors contributing to the mental problems in students, especially high school students, today. Prior evidence demonstrated the significant associations between mood disorders such as anxiety and depressive disorders and peer pressure (Kapoor et al., 2020). Adolescents with more peer pressure at school reported more somatic issues including but not limited to physical pain, shortness of breath or sleep disturbance (Randall et al., 2019). Irregular sleep patterns and the inability to be able to get enough REM sleep have been linked to loss of focus and irritability. Particularly, researchers have identified sex/gender differences in susceptibility to peer influence, which would also be reflected in their mental health (McCoy et al., 2019). A speculative peer-socialization model has highlighted the behavioral and socio-cognitive styles, stress and coping strategies, and relationship provisions (Rose and Rudolph, 2006). It still remains unclear, however, how peer pressure plays a role in perception of grades. An investigation of sex differences in the interrelations between peer pressure and mental health would advance our understanding of mental development of adolescents.

For instance, in a study conducted among high schoolers, 57.8% of high schoolers reported having less than 9 hours of sleep – which is the recommended amount for adolescents. An increase in sleep has been

linked with better mental health. A study conducted found that improving sleep leads to less levels of depression, rumination, anxiety, and bad mental health. Greater improvements in sleep lead to greater levels of mental health (Scott et al., 2021; Wheaton et al., 2018). The relationships between stress, sleep, peer pressure, and mental health have not been fully understood. An examination of these relationships in contemporary high schools is needed.

In addition, some common effects of this stress in this study included anxiety, depression, and withdrawal from social situations as well as somatic complaints. Somatic complaints have been shown to be a risk factor in depressive symptoms in women's mental health (Terre et al., 2003).

In the current study, we aimed to examine the relationships between test numbers, peer pressure, sleep quality, and mental health, especially depression. We also examined sex differences in the relationships. We hypothesized that more school tests would be correlated with higher stress, more sleep dysfunctions, and higher levels of mental problems.

## Methods and Materials

### Participants

One hundred and sixteen high school students (mean age: 15.36 years old) participated in this study. Most students were selected at random from high schools around the great area of Scarsdale; however, there were also students from other countries and schools that took this survey (White: 39%; African American: 3%; Asian: 32%; Other: 26%). All research was performed in accordance with relevant guidelines/regulations, and written informed consent was obtained from each individual prior to participation.

### Assessments

We collected demographic information such as age, gender, grade, and race. We also asked the students for their school performance, studying hours on weekdays and weekends separately, and the number of tests per month.

We measured the symptoms of depression, anxiety, and somatic complaints with questions from the Children Behavior Checklist (ref). Each item's response was rated on a 4-point scale: 0 (Never), 1 (sometimes), 2 (often), and 3 (always). Higher scores indicate more symptoms. Participants were also assessed with the Pittsburgh Sleep Quality Index (PSQI), to evaluate the quality of sleep (Buysse et al., 1989). Each PSQI question is rated from 0 = no difficulty to 3 = severe difficulty. The PSQI total score ranges from 0 to 21 and a score > 5 indicates clinically significant sleep deficiency. We asked the students to complete the Adolescent Stress Questionnaire for the measurements of overall stress as well as different types of stress related to home life, school performance, school attendance, romantic relationships, peer pressure, teacher interaction, future uncertainty, leisure conflict, and financial pressure. We measured the feeling of self-doubt of the students using a 3-point scale (0-Never, 1-Sometimes, 2-Often).

### Statistical Analyses

We compared demographics and clinical measures between sexes (i.e., boys, girls, and non-binary) using one-way analysis of variance (ANOVA). We performed Pearson's correlation analyses in all subjects, with age, sex, and race as covariates. In particular, we focused on the relationships of test numbers and peer pressure with clinical measurements, respectively.

## Results

We examined the gender differences in all measurements. Boys were slightly older than girls. For mental health measurements, non-binary and non-conforming gendered individuals as compared to boys and girls showed significantly higher scores on anxious depression, withdrawn depression, somatic complaints, and self-doubt. Non-conforming genders as compared to boys and girls showed more sleep problems, peer pressure and stress from interaction with teachers. In addition, non-conforming genders as compared to boys showed higher overall stress and specific stress on school performance, future uncertainty, and leisure conflict. Moreover, girls vs. boys showed more stress on school performance and less overall stress.

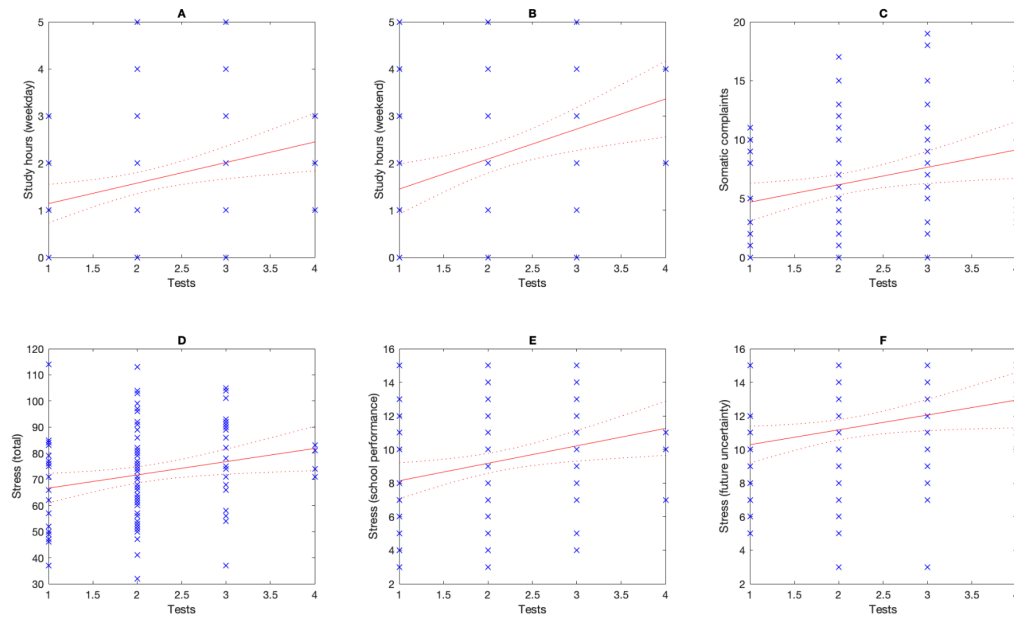
**Table 1.** Demographic and clinical measurements in boys, girls, and other gender.

Measures	Boys (n = 33)	Girls (n = 72)	Nonbinary (n = 11)	F (p)	Post-hoc tests
Age (year)	15.88±1.24	15.11±1.38	15.36±1.50	3.58 (0.031)*	B > G*
School performance	2.44±1.66	2.32±1.32	3.18±1.94	1.59 (0.209)	/
Number of tests	1.91±0.68	2.22±0.76	2.09±0.70	2.10 (0.128)	/
Study hours (week-day)	1.36±1.08	1.85±1.30	1.00±1.10	3.38 (0.038)*	NS
Study hours (week-end)	1.88±1.64	2.36±1.71	1.73±1.19	1.40 (0.251)	/
<b>Mental health</b>					
Anxious depressed	9.70±6.89	12.04±5.83	18.36±4.65	8.42 (< 0.001)	O > B* O > G*
Withdrawn depressed	3.27±2.47	3.46±2.40	6.55±2.84	8.21 (< 0.001)***	O > B* O > G*
Somatic complaints	3.97±3.96	6.68±4.64	11.27±4.88	11.51 (< 0.001)***	O > B* O > G*
Self-doubt	2.61±1.48	3.00±1.43	4.55±1.04	7.80 (0.001)**	O > B* O > G*
<b>Sleep problems</b>					
Bed-to-sleep (hrs)	0.50±0.53	0.58±0.55	0.73±0.55	0.79 (0.455)	/
Sleep hours	6.99±1.07	6.94±1.17	6.91±1.70	0.03 (0.968)	/
Sleep hours (week-day)	6.70±1.39	6.62±1.36	6.95±1.86	0.27 (0.768)	/

Sleep hours (week-end)	8.71±1.51	8.60±1.81	8.95±.88	0.24 (0.785)	/
Sleep efficiency	93.6±6.06	92.20±6.21	89.92±8.83	1.44 (0.242)	/
PSQI sum	6.39±2.70	7.11±2.73	10.09±3.56	7.28 (0.001)**	O > B* O > G*
<b>Stress</b>					
Home life	18.67±5.72	20.47±5.88	20.91±5.67	1.24 (0.293)	/
School performance	7.58±3.41	9.79±2.97	11.27±2.45	8.44 ( $< 0.001$ )***	G > B* O > B*
School attendance	4.73±2.44	5.89±2.12	6.09±2.88	3.22 (0.044)*	NS
Romantic relationships	1.12±1.65	1.53±2.61	2.09±2.84	0.74 (0.480)	/
Peer pressure	7.45±3.84	7.06±2.37	9.82±2.71	4.35 (0.015)*	O > B* O > G*
Teacher interaction	4.70±2.14	5.32±2.61	7.36±2.80	4.69 (0.011)*	O > B* O > G*
Future uncertainty	10.27±3.92	11.40±3.01	13.45±1.92	4.18 (0.018)*	O > B*
Leisure conflict	7.55±3.73	8.83±3.21	10.73±2.37	4.13 (0.019)*	O > B*
Financial pressure	2.97±1.96	3.25±1.92	4.27±3.10	1.65 (0.196)	/
Overall	65.03±18.39	73.54±15.80	86.00±11.20	7.43 (0.001)**	O > B* B > G*

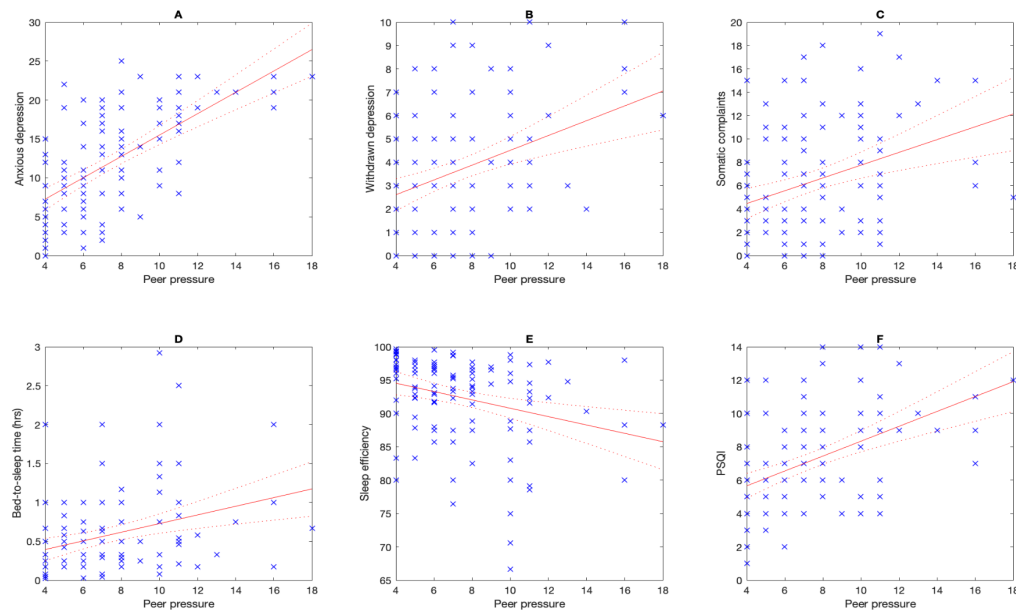
Note: \*p < 0.05, \*\*p < 0.005, \*\*\*p < 0.001

As shown in Figure 1, more tests that students take monthly were correlated with longer study hours during both weekdays and weekends, more somatic complaints, higher stress levels particularly stress related to school performance and future uncertainty, indicating mental health problems may result from the amount of tests in school.



**Figure 1.** Scatter plots of correlations between tests and (A) study hours (weekday); (B) study hours (weekend); (C) somatic complaints; (D) stress (total); (E) stress (school performance); and (F) stress (future uncertainty).

Figure 2 presents the significant correlations of peer pressure with mental health and sleep measures. Specifically, we found that higher peer pressure was associated with more symptoms of anxious depression and withdrawn depression, more somatic complaints, longer bed-to-sleep time, less sleep efficiency, and poorer sleep quality.



**Figure 2.** Scatter plots of significant correlations between peer pressure and (A) anxious depression; (B) withdrawn depression; (C) somatic complaints; (D) bed-to-sleep time (hrs); (E) sleep efficiency; and (F) PSQI total score.

## Discussion

We found that non-binary individuals showed significantly higher levels of mental health problems than boys or girls, which may be due to uneven sample sizes (i.e., fewer in the non-binary group). We also observed significant positive correlations between test amounts and mental health of the high school students, including somatic complaints and stress. Additionally, higher levels of peer pressure was significantly associated with elevated severity of mental health - more depression symptoms, somatic complaints, as well as worse sleep quality. We discuss the main findings below.

### Sex Differences

We observed gender differences in mental health, sleep quality, and overall stress, particularly when we compared non-binary vs. boys/girls. Prior evidence demonstrated higher prevalence or risks of psychological problems in girls as compared to boys, particularly depression, beginning at mid-puberty and throughout adulthood (Altemus et al., 2014; Eid et al., 2019). Although we did not find significant differences in mental health measurements between boys and girls of our sample, we found that non-binary adolescents showed higher severity of depression, anxiety, and somatic complaints. These findings are consistent with previous reports showing psychological problems in non-binary adolescents (de Graaf et al., 2021; Rimes et al., 2020). Non-binary adolescents showed more sleep dysfunctions, in line with prior evidence revealing sleep deficits in the non-binary group (Dolsen et al., 2022). In addition, nonbinary adolescents had more overall stress and stress on school performance, future uncertainty, and leisure conflicts (Chavanduka et al., 2021; Poquiz et al., 2021).

### Associations Between Tests, Peer Pressure, And Mental Health

In line with prior evidence showing study hours positively predicted test anxiety (Cayubit, 2014), we found that students spent more time studying because of high volumes of tests at high school. The students also reported increased somatic complaints and stress especially for school performance and future uncertainty with more tests at school. These findings are consistent with previous studies that showed students with high levels of school-related stress complaining about headache, abdominal pain, backache, or dizziness (Torsheim and Wold, 2001). In future research, we may further investigate the underlying mechanisms.

We observed that higher peer pressure was associated with more severe symptoms of depression, anxiety, and somatic complaints. These findings are in line with prior evidence that demonstrated the positive correlations between peer pressure in adolescents and issues regarding their mental health (Cruz et al., 2022; Ungar, 2000). For instance, a recent study found that stress of school performance and attendance was linked to depression symptoms in both boys and girls (Moksnes et al., 2016). Moreover, sex may play an important role in these relationships - boys vs. girls showed stronger relationships between peer pressure and depressive symptoms while girls vs. boys showed stronger relationships between stress of home life and depressive symptoms. In the current study, given that our sample size was not large enough to examine the sex differences in the relationships, future studies may consider exploring the sex effects.

We also found that adolescents with more peer pressure may have problems in sleep, including longer time to fall asleep, lower sleep efficiency, and poorer sleep quality. A longitudinal study showed that susceptibility to peer influence leads to sleep problems in students aged from 12 to 15 years old (Semenza et al., 2020). Another study found that students with more academic stress may have sleep dysfunction, and the association

was influenced by peer relationships (Deng et al., 2023). However, students in different grades may have distinct sleep schedules or patterns. In future research, we may take the grade differences into account to investigate the relationships between peer pressure, academic stress, and sleep issues.

## Limitations and Conclusions

We consider some limitations for the current study. First, our sample was limited in the Scarsdale area, which is notorious for pressure of school performance on students. In future studies, we may need to include more widespread samples. Second, we only used subjective tools to measure all the variables of interest. Third, we are not able to test causality because of the nature of the cross-sectional design. In order to examine whether tests and stress lead to depression and anxiety, and sleep dysfunctions, a longitudinal study would be warranted.

In conclusion, we identified and highlighted the correlations between test numbers and mental health problems in adolescents and between peer pressure and mental and sleep problems. Mental or academic support from the school including teachers and counselors may be needed for the high school students to not suffer from the burden of tests and homework.

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