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Stress, Anxiety and Depression in Adolescents and School Climate

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Abstract

Few empirical studies have examined adolescent mental health in Central Asia, and data from Uzbekistan are especially scarce. This study aims to assess the prevalence of stress, anxiety, and depression among adolescents and to investigate the impact of school climate on their mental health. This research employed a quantitative survey approach. A total of 22,854 adolescents aged 12-18 across 299 schools in urban and rural areas of Uzbekistan were surveyed. The findings indicate that a considerable proportion of students showed elevated levels of stress (16%), anxiety (22%), and depression (18%), which is consistent with similar studies in other countries. Moderate negative correlations were observed between these levels and perceptions and attitudes towards teachers, peers, social connectedness, and exams. In the context of ongoing reforms in Uzbekistan, the findings provide an empirical baseline for designing school-based interventions and offer a broader understanding of adolescents' mental health in non-Western contexts.

Key words: mental health, school, anxiety, depression, stress.

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Novelty and Significance

What is already known about the topic?

- Adolescent problems of stress, anxiety, and depression are globally prevalent yet often under-recognized and untreated, particularly in low- and middle-income countries.
- The school climate, including relationships with teachers, peers, and feelings of connectedness, strongly influences adolescents' psychological well-being.
- Most existing evidence comes from Western contexts, with limited data from Central Asia.

What this paper adds?

- Provides the first large-scale survey on adolescent mental health in Uzbekistan.
- The results show a correlation between poor school climate and elevated stress, anxiety, and depression.

The mental health of adolescents has received limited attention in public health initiatives and state policies over recent decades (Benton, Boyd, & Njoroge, 2021; Orth & van Wyk, 2022), even though adolescence is a critical developmental period for establishing the foundations for adult health and well-being (Kieling *et alii*, 2011). Yet, interest in adolescent mental health has increased in recent years. Accumulating evidence suggests that a substantial proportion of mental health problems originates in mid-to-late adolescence and contributes to later life mental health difficulties (Das *et alii*, 2016; Lin & Guo, 2024; Scheiner, Grashoff, Kleindienst, & Buerger, 2022).

According to the World Health Organization (WHO), one in seven young people aged 10-19 experiences a mental disorder, accounting for 15% of the global burden of disease in this age group, yet many cases remain unrecognized and untreated (WHO, 2024). Emotional disorders -characterized by elevated levels of anxiety, depression, fear, and somatic symptoms- are among the leading contributors to the global burden of disease among young people (Burstein, Agostino, & Greenfield, 2019; Clarke, Pote, & Sorgenfrei, 2020; WHO, 2019).

Multiple factors contribute to the development of mental disorders in adolescence, ranging from individual characteristics to relational, community, and broader environmental

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influences (Cavioni, Grazzani, Ornaghi, Agliati, & Pepe, 2021). The role of school in adolescents' mental health has been documented in numerous studies, that have primarily examined academic outcomes (Lee, Griffin, Ragavan, & Patel, 2024; Suldo, Shaunessy-Dedrick, Ferron, & Dedrick, 2018), school dropout (De Ridder et alii, 2013; Trusty *et alii*, 2025), bullying (Cavioni *et alii*, 2021; Källmén & Hallgren, 2021), school connectedness (Lester, Waters, & Cross, 2013; Perren *et alii*, 2010; Raniti *et alii*, 2022; Sochet & Smith, 2014) and related factors.

School climate -defined as the pattern of students', parents', and school personnel's experience of school life [that] reflects norms, goals, values, interpersonal relationships, teaching and learning practices, and organizational structures (WHO & UNICEF, 2021)- can significantly influence adolescent health outcomes. In a recent UNICEF study adolescents worldwide described school as a source of self-esteem, a place that fosters greater awareness of the wider world, an environment for spending time with friends, a source of emotional support, and sometimes an escape from toxic home environments. However, school was also frequently described as a setting for violence and abuse -a common experience- that can undermine its protective potential. Additionally, extreme academic pressure and a lack of supportive school personnel were identified as factors that increase young people's vulnerability (John Hopkins University & UNICEF, 2022).

Uzbekistan is a middle-income country in Central Asia with a population of 32.4 million, of whom adolescents constitute approximately 16.2% (around 5.5 million adolescents) (UNICEF Uzbekistan, 2020). Following independence after the collapse of the Soviet Union the country experienced a prolonged period of stagnation in mental health services, which remained concentrated in old overcrowded psychiatric institutions with poor sanitary conditions (Aliev & Salisbury, 2020). Regarding adolescents' mental health, there remains a significant gap in comprehensive evidence. The Development Strategy Framework of the Republic of Uzbekistan (to 2035) includes several targets and strategic initiatives relevant to reducing barriers to improved mental health service access and provision (WHO, 2021). Although the country is now more open to a wide range of reforms, the lack of robust evidence to guide informed interventions remains a major obstacle to achieving necessary systemic changes.

Pre-COVID-19 data already revealed concerning trends in self-harm and emotional disorders among adolescents. In 2019, there were 374 cases of self-harm among girls aged 10 to 14, and 355 cases among boys of the same age. Among older adolescent (aged 15-19), there were 1,987 cases among girls and 1,460 cases among boys (UNICEF, 2021). Both girls and boys in the adolescent age group have reported experiencing depression, mood swings, mental disorders, and suicidal ideation linked to psychological violence from teachers and peers in school settings (UNICEF, 2021).

Drawing on existing evidence and research concerning adolescents' mental health and psychosocial well-being, this study aims to assess the prevalence of stress, anxiety, and depression among adolescents in Uzbekistan and to examine how school-related factors (e.g., teacher-student relationships, peer interactions, social connectedness, and examination/test climate) are associated with their psychosocial well-being.

Method

Participants

The participants of this study were adolescent boys and girls aged 12 to 18 years old. The total number of participants was 22,854 (girls 51%) with an average age of 15 years, from 299 schools of both urban and rural areas in all 14 regions of Uzbekistan. Participants were recruited through a multi-stage sampling procedure. Participation in rural and urban areas was almost equal, with 51% of participating adolescents residing

in urban areas and 49% of them in rural areas.

The sampling frame for this research was the total number of public schools in Uzbekistan as of September 2021, based on official data received from the Ministry of Education. This sampling method was based on large-scale international assessments used typically to assess students' achievement, with strict sampling and implementation criteria and procedures, such as Trends in International Mathematics and Science Study (TIMSS) and PIRLS (Progress in International Reading Literacy Study) (Joncas & Foy, 2012).

The inclusion criteria used for the initial selection from participants between 12 and 18 years old were the students' year grades. All students in the 6th, 9th, and 11th grades (ages 12, 15, and 18) were eligible for inclusion. These grades were chosen to represent the three different stages of adolescent development (Salmela-Aro, 2011): early adolescence (10-13 years), with important changes in body and behavior (emotional development and socialization); middle adolescence (14-17 years), which marks the beginning of interest in romantic and sexual relationships, while the body changes as puberty continues; and late adolescence (from 18 years onwards), in which better impulse control is achieved.

A random sample of 150 urban and 150 rural schools was selected from the school sampling frame using a random number generator, based on a probability proportional to enrollment, separately for the urban and rural school subsamples. Once the schools were selected, the classes participating in the study were chosen as entire classes. Class selection was also performed randomly, using a random number generator to choose one class from each selected school. A total of 4,000 students participated in the study for each grade level. According to TIMSS and PIRLS guidelines, these sample estimates of any percentage-level estimate at the student level (e.g., a student's background characteristics) have an adequate confidence interval (e.g., 3.5% or higher). This criterion was met given the number of schools and the number of students per grade. One school was excluded from the final sample because it was undergoing reconstruction during the survey.

Instruments and Measures

Results were obtained using a questionnaire consisting of three sections that captured the following types of data:

Section of General Information. Data about the participant characteristics, including questions about demographic data, age, gender, grade, employment, et cetera.

Section School Climate. This section covering attitudes towards teachers, other students, feelings of social connectedness, and perceptions about tests/exams was a shorter version of *School Attitude Questionnaire* (Şeker, 2011) developed to assess students' attitudes toward their school environment using Likert-type items (5-point scale from "strongly agree" to "strongly disagree") grouped into four subscales: perceptions and relations to peers, attitudes and relations to teachers, social connectedness and tests and exams -thereby capturing affective, social, and academic-evaluative dimensions of students' school experience. For instance, one item from the "Attitudes towards teachers' subscale was: "I like the way my teachers teach at this school." Reliability results of this scale for this study proved satisfactory after interviews with 10 teenagers and the pilot test with 166 respondents (Cronbach's $\alpha > .70$).

Section on Emotional States. This section covered obtaining data on emotional states using the questionnaire *Depression, Anxiety and Stress Scale-21* (DASS-21, Lovibond & Lovibond, 1995). The DASS-21 has three main subcategories of emotional states: depression, anxiety and stress. The scoring scale and cut-off points are provided by the authors. For each category there are five levels of experience: normal, mild, moderate, severe and extremely severe. For this study, normal and mild levels were grouped under the category *within normal levels*

and moderate, severe and extremely severe under the category *elevated levels*. Reliability results of this scale for this study proved satisfactory after interviews with 10 teenagers and the pilot test with 166 respondents (Cronbach's α >.70). Each of the three DASS-21 scales contains seven items, divided into subscales with similar content. The depression scale assesses dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest/ involvement, anhedonia and inertia. The anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect. The stress scale is sensitive to levels of chronic non-specific arousal. It assesses difficulty relaxing, nervous arousal, and being easily upset/agitated, irritable/over-reactive, and impatient. Respondents indicate how much each statement applied to them over the past week, using a 4-point Likert-type scale (0= Did not apply to me at all; 1= Applied some of the time; 2= Applied to a considerable degree or good part of the time; and 3= Applied very much or most of the time). For instance, some items were: "I found it hard to wind down" (stress subscale), "I was aware of dryness of my mouth" (anxiety subscale), and "I couldn't seem to experience any positive feeling at all" (depression subscale) (Osman *et alii*, 2012).

Procedure

The study protocol and its procedures received ethical approval from the UNICEF External Ethical Review Board. It encompassed research tools, informed consents from parents and informed assents from adolescents. Before the survey began, data collectors were trained in ethical research processes with children. Also, a list of local psychologists and their contact numbers was provided to both parents and adolescents in case they became distressed or were deemed to be needing protection assistance.

Initially, the questionnaire was translated into both Uzbek and Russian languages, both of which are spoken in Uzbekistan schools. These questionnaires were piloted with cognitive interviews with 10 children from both urban and rural areas by trained psychologists. After their feedback, the questionnaire was revised. In the second stage of piloting, the questionnaire was administered to a total of 166 students, again from both urban and rural areas, to test the reliability of the questionnaire and its subscales. Cronbach's alpha values were satisfactory to proceed with data collection for the whole sample (α >.70).

The team of data collectors received an initial training about the administration of the questionnaire and ethical procedures. The team contacted the school directors to arrange the process of the survey. Afterwards, the homeroom teachers were engaged to get the informed consent from the parents of the students in the selected classes. During the administration of the questionnaire only the data collector and the school psychologists were present, but not the teachers. They explained that their participation in the survey was voluntary and that even though their parents had consented, they had the right to either participate or not, without any sanction.

Data Analysis

The dataset was processed using the statistical package IBM SPSS, version 26. Descriptive statistics (frequency, percentage, crosstabs, etc.) were used to present findings observed in the database. Data disaggregation was conducted for every question in the questionnaire. The main variables for data disaggregation were sex (M/F), level of urbanization (urban/rural), employment (working/non-working students), and levels of depression, anxiety and stress (measured with the DASS scale described above). Cross-tabulations were the main data disaggregation method used. Correlation was used to explore the relation between levels of depression, anxiety and stress, and school experience.

The methodology used by TIMSS and PIRLS is designed to accurately represent the target populations within a specified margin of sampling error. Essentially, a student's sampling weight is the inverse of the student's probability of selection, with appropriate adjustments for non-response. The initial sample frame was designed for 300 schools, but one school was out of scope, so 299 schools were ultimately selected. The weighting conducted for this analysis comprised three components: (1) Weight of a school within a specific region; (2) Weight of a class in the same grade; and (3) Weight of a student within the selected class. An adjustment for non-response was conducted in each stage.

Results

Only students of grades 6th, 9th, and 11th were selected for this study. The distribution of adolescents in these three grades was 34.3% in grade 6th, 34.1% in grade 9th, and 31.6% in grade 11th. While for grades 6th and 9th the distribution of girls and boys was almost equal, in grade 11th there were 10% more girls than boys.

During data collection, 5% of participants indicated they were working. Of those who said they worked, 31.6% were working full-time, while 58.1% were working less than 8 hours/day. Also, adolescent boys prevailed compared to girls in relation to working (79.4% of working students were boys). Broken down by urban-rural areas, a slight majority of working students (56.7%) lived in urban areas.

Table 1 shows that most of adolescents reported normal emotional states for all three components, with 84.3% of students reporting normal category for stress, 77.8% for anxiety, and 81.6% for depression. However, there was a substantial proportion of adolescents who had moderate to extremely severe anxiety and depression, while the levels of stress were slightly lower.

Table 1. Normal and elevated levels of stress, anxiety and depression.

	Stress	Anxiety	Depression
Within normal range	84.3%	77.8%	81.6%
Elevated	15.7%	22.2%	18.4%

In the group of adolescents reporting high levels of stress, 59% were girls. And the girls also showed slightly higher levels of anxiety (56%) and depression (54%) than the boys. The same was true for working adolescents compared to those who were not working, while no difference was observed for grade or urban/rural place of living.

The assessment of school experiences for the adolescents included attitudes towards teachers and interactions, relations with peers, social connectedness, and perceptions about tests and exams (results are shown in Figure 1). Most adolescents described their teachers having a respectful attitude towards students (89.6%), understanding their problems (85.2%), being available to talk to them (85.8%), caring about their students (85.5%), and making them feel good about themselves (84.5%).

Although most students described their teachers' attitudes and interactions positively, a consistent proportion reported unfavorable perceptions. Across items referring to teachers' respectfulness, support, and availability, between 10% and 15% of respondents provided negative evaluations.

A different response pattern emerged for the statement "Teachers are only interested in good students," for which responses were approximately evenly divided between agreement and disagreement. This distribution contrasts with the predominantly positive responses observed for the other teacher-related items.

Consistent with perceptions of teachers, peer relationships were reported positively by most students. More than 90% indicated that students at their schools liked each other

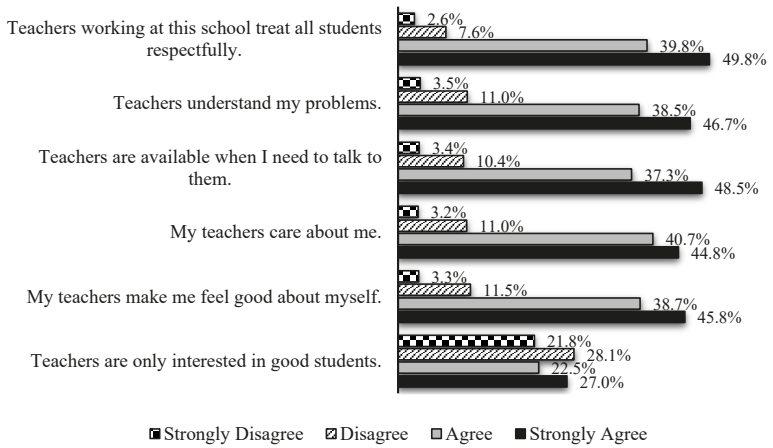

Figure 1. Perceptions of teachers.

and got along well. Similarly, 91.9% reported that their absence would be noticed by a teacher or another student. In contrast, approximately 10% of respondents expressed negative perceptions of peer interactions (see Figure 2).

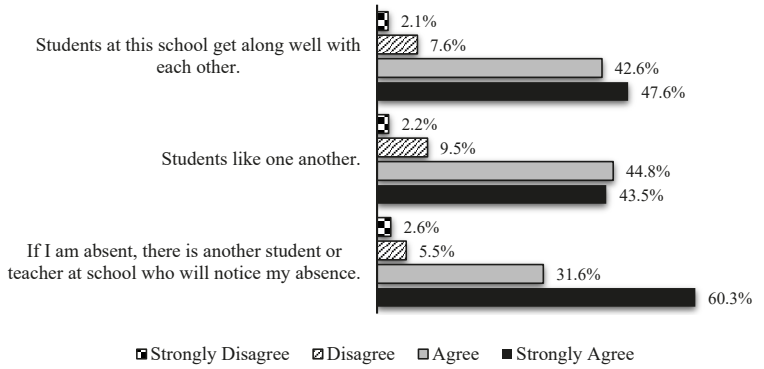

Figure 2. Perceptions of peers.

Figure 3 indicates that a proportion of students reported limited social connectedness. Specifically, 8.7% stated that they did not feel they belonged to their school, and 13.1% reported not feeling part of their school community. Feelings of loneliness in the classroom were reported by 16.7% of respondents, representing the highest percentage among the social connectedness items (see Figure 3).

In relation to students' perceptions of tests and exams the respondents reported that they could ask questions when they don't understand something (95.7%), that exam questions were clear and understandable (92%), and that they measured their real success (94.1%). Concerning the way their mistakes are corrected, there was a slight decline in the percentage of students who believed that these mistakes are corrected without students being offended (see Figure 4).

Finally, Table 2 shows the statistically significant correlations obtained between

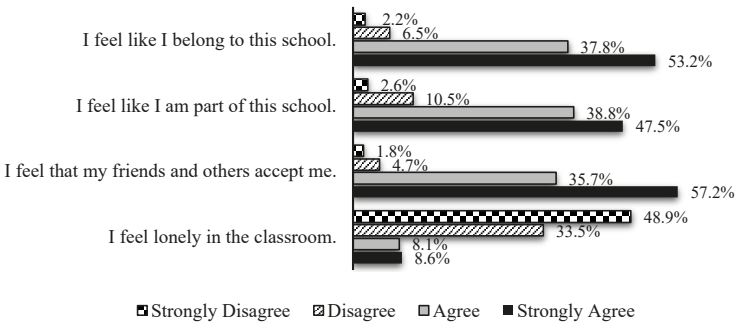

Figure 3. Social connectedness.

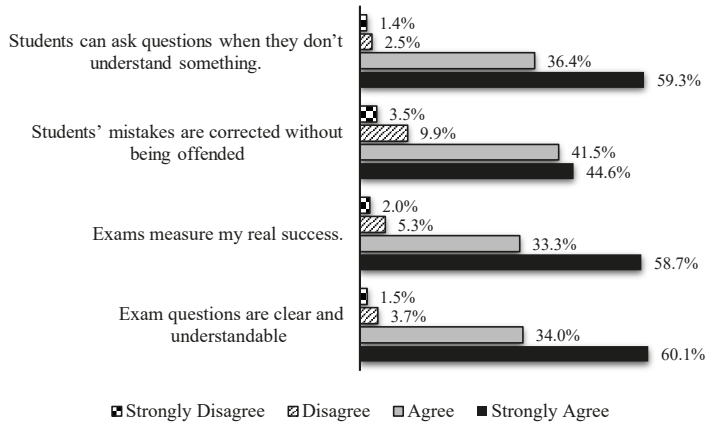

Figure 4. Perceptions of tests and exams.

the report of states of stress, anxiety, and depression and quality of school experience. The results indicate a stronger negative relation between perceptions of teachers and stress/anxiety/depression levels, followed by social connectedness, and relations to peers (see data in Table 2).

Table 2. Correlations between stress, anxiety and depression levels and school experience.

School experience	Stress	Anxiety	Depression
Perception and relations to peers	-.201**	-.168**	-.173**
Attitudes and relations to teachers	-.267**	-.219**	-.228**
Social connectedness	-.231**	-.208**	-.229**
Tests and exams	-.184**	-.163**	-.161**

Notes: **= correlation significant at $p < .01$ (2-tailed); r= Pearson correlation.

DISCUSSION

This study examined the prevalence of stress, anxiety, and depression among adolescents in Uzbekistan and their association with school climate, contributing empirical evidence from a context where systematic research remains limited (Aliev & Salisbury, 2020). Although the proportion of adolescents reporting elevated distress

is comparable to international estimates (Kessler, Petukhova, Sampson, Zaslavsky, & Wittchen, 2012; Scheiner *et alii*, 2022; Lin & Guo, 2024; WHO, 2024), the findings clarify how specific dimensions of school experience relate to emotional well-being within the Uzbek educational system.

Perceptions of teachers showed the strongest association with stress, anxiety, and depression levels. Students who described teachers as respectful, supportive, and approachable reported lower psychological distress. This pattern is consistent with studies linking teacher-student relationships to adolescent well-being (Longobardi, Prino, Marengo, & Settanni, 2016; Lee *et alii*, 2024). In the Uzbek educational context, where classroom interactions have traditionally emphasized hierarchical authority, these associations indicate that relational aspects of teaching are closely linked to students' emotional functioning.

Social connectedness and peer relations were also associated with mental health outcomes. Feelings of belonging and peer acceptance corresponded to lower levels of distress, consistent with research on adolescents belongingeness (Allen & Bowles, 2012). Previous research has documented the role of peer acceptance in reducing depressive symptoms and emotional difficulties (Benton *et alii*, 2021; Orth & van Wyk, 2022; Raniti *et alii*, 2022). The present results demonstrate similar patterns in a Central Asian school setting, where peer networks may serve as an important source of informal support.

Perceptions of tests and examinations showed weaker associations with emotional distress than interpersonal dimensions of school climate. Although academic assessment is frequently described as a source of school-related stress (Putwain, 2009; Pascoe, Hetrick, & Parker, 2020), the findings indicate that students' emotional responses are more strongly related to relationships with teachers and feelings of connectedness than to exam-related factors.

These results should be considered in relation to Uzbekistan's developing mental health infrastructure. Limited availability of school-based psychosocial services increases the relevance of everyday school interactions as potential sources of support. National reform frameworks aim to improve access to mental health services (WHO, 2021), but locally grounded evidence has been limited. Evidence from other middle-income countries indicates that school-based and peer-support initiatives are associated with reductions in adolescent distress (Barry, Clarke, Jenkins, & Patel, 2013; Fazel, Patel, Thomas, & Tol, 2014). The present study provides data that may inform the adaptation of such approaches within Uzbek schools. These findings indicate that interventions focusing exclusively on academic performance may overlook relational dimensions that are more strongly associated with adolescents' emotional well-being. Programs that strengthen teacher-student communication and peer connectedness may therefore represent a relevant focus for future school-based initiatives within the Uzbek context.

Several limitations should be noted. The cross-sectional design does not permit causal inference, and responses collected in classroom settings may have been influenced by contextual factors despite procedural safeguards. The analysis focused on school-related variables and did not include family or community influences that may also contribute to adolescents' mental health. Future studies using longitudinal designs and multi-level approaches would clarify these relationships.

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