PSYCHOLOGY AND PSYCHIATRY

PSYCHOMETRIC PROPERTIES ANALYSIS OF THE HOSPITAL ANXIETY AND DEPRESSION SCALE (HADS) ON A SAMPLE OF RUSSIAN-SPEAKING STUDENTS

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RESUME

Background. *Universal and student-specific stressors can lead to the development of anxiety and depression. The Hospital Anxiety and Depression Scale (HADS) has proven effective in various populations. However, measuring anxiety, depression, and stress in the student population may have its own peculiarities, which create a need for a tailored tool to assess anxiety and depression levels among young people studying in higher education institutions.*
The aim. *Assessment of the psychometric properties, including the factor structure, reliability, and external validity of the HADS in Russian-speaking students.*
Materials and methods. *The sample consisted of 891 students, including 198 males (22 %) and 693 females (78 %), aged 16 to 37 years (mean age is 19.8, median age – 19.0, SD = 2.13).*
Results. *The Cronbach's alpha for the "Anxiety" subscale was 0.73, for the "Depression" subscale it was 0.62, and for the overall questionnaire it was 0.79. Principal Component Analysis confirmed the alignment of the questionnaire's structure with the original two-factor model proposed by the authors. Both the full model and a reduced model (excluding item 6) derived from confirmatory factor analysis demonstrated similar model fit indices. Based on the comparison of principal component and confirmatory analyses, it was decided to exclude item 6 from the questionnaire while retaining item 11 in the second factor.*
Conclusions. *The analysis concluded that the Hospital Anxiety and Depression Scale exhibits satisfactory psychometric properties and can be used for screening emotional distress among students.*

Keywords: *anxiety, depression, psychometrics, Hospital Anxiety and Depression Scale, students*

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АНАЛИЗ ПСИХОМЕТРИЧЕСКИХ СВОЙСТВ ГОСПИТАЛЬНОЙ ШКАЛЫ ТРЕВОГИ И ДЕПРЕССИИ (HADS) НА ВЫБОРКЕ РУССКОЯЗЫЧНЫХ СТУДЕНТОВ

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РЕЗЮМЕ

Обоснование. *Универсальные и специфические для студентов стрессоры могут вести к развитию тревоги и депрессии. «Госпитальная шкала тревоги и депрессии» (HADS) доказала свою эффективность в различных популяциях. Методика измерения тревоги, депрессии и стресса в студенческой популяции может иметь свои особенности, поэтому существует необходимость в получении инструмента для оценки уровней тревоги и депрессии среди молодежи, обучающейся в высших учебных заведениях.*

Цель исследования. *Оценка психометрических свойств, в том числе, факторной структуры, надежности и внешней валидности HADS на русскоязычных студентах.*

Методы. *Дизайн исследования включал однократное прохождение участниками Госпитальной шкалы тревоги и депрессии в онлайн-формате. В исследовании принимали участие студенты российских высших учебных заведений. Данные собирались в течение 1,5 месяцев.*

В выборку вошел 891 студент, из них 198 мужчин (22 %) и 693 женщины (78 %) в возрасте от 16 до 37 лет (средний возраст 19,8 года, медианный возраст 19,0 года, стандартное отклонение 2,13). Факторная структура анализировалась с использованием анализа главных компонент и конфирматорного факторного анализа, надежность оценивалась с помощью коэффициента альфа Кронбаха, которая для субшкалы «Тревога» составила 0,73, для субшкалы «Депрессия» – 0,62, а для общей шкалы – 0,79.

Результаты. *Анализ главных компонент подтвердил соответствие структуры опросника исходной двухфакторной модели, предложенной авторами. Как полная, так и сокращенная модель (с исключением пункта 6), полученные в ходе конфирматорного факторного анализа, показали схожие индексы соответствия модели. По результатам сравнения анализа главных компонент и конфирматорного факторного анализа было принято решение исключить пункт 6 из опросника, оставив пункт 11 во втором факторе.*

Заключение. *Анализ показал, что «Госпитальная шкала тревоги и депрессии» обладает удовлетворительными психометрическими характеристиками и может использоваться для скрининга эмоционального дистресса среди студентов.*

Ключевые слова: *тревога, депрессия, психометрика, «Госпитальная шкала тревоги и депрессии», студенты*

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INTRODUCTION

The Hospital Anxiety and Depression Scale (HADS) was developed in 1983 [1]. The authors designed a self-report mood scale for use in non-psychiatric settings. Due to the requirement for a concise questionnaire, they limited the scale to two main areas: anxiety and depression. This scale consists of 14 items and two subscales (each with 7 items):

I. Depression, which measures the severity of depressive symptoms (normal, subclinical, and clinical depression);

II. Anxiety. The scale reflects the level of anxiety symptoms (from normal to clinical anxiety).

Responses are provided on a 4-point Likert scale. It should be noted that the authors sought to develop a tool for assessing emotional changes in a patient's condition, irrespective of their physical health condition.

The level of depression and anxiety is determined based on the scores obtained: scores between 0 and 7 indicate a normal level, scores between 8 and 10 indicate a subclinical level, and scores of 11 or higher indicate a clinical level of anxiety and depression [1]. The questionnaire has been validated by researchers from various countries [2–4] and is widely used by psychologists to assess the levels of anxiety and depression across different populations [5–8]. It has also been proven to be effective for use with Russian-speaking individuals [9–11].

Limitations of Russian-language adaptation studies include small sample sizes, difficulties in correlating individual items with selected factors based on factor loadings, and a lack of confirmatory factor analysis procedures [9, 10]. This study aims to explore these issues and potential solutions.

Validation in clinical populations. Studies conducted in various Russian clinical settings examined the psychometric properties of the HADS in patients with movement disorders [11]. The study included 100 patients who were undergoing inpatient rehabilitation after a stroke or due to chronic musculoskeletal conditions. The HADS was found to have a tendency to over-diagnose anxiety and depression in comparison with the Hamilton Anxiety Scale and Hamilton Rating Scale for Depression. However, the HADS demonstrated satisfactory internal consistency and discriminant validity. Based on the results of the study, adjusted cutoff values were proposed for the HADS-A (9 points for anxiety) and HADS-D (9 points for depression) to improve the accuracy of screening in this patient population. The modified adaptation of the HADS exhibited high specificity but lower sensitivity, indicating that it is primarily useful as a screening tool to identify patients who may require additional psychological assessment. Another study discusses the validation of the Russian-language adaptation of the HADS among patients with mental disorders and healthy controls [10]. A sample of 283 participants was evaluated, and a factor analysis confirmed the two-factor structure of the scale. The study demonstrated high internal consistency, with the Cronbach's alpha values of 0.90 for the overall scale, 0.86 for anxiety, and 0.84 for depression, confirming the reliability of the instrument. Based on predictive modeling and ROC analysis, optimal cut-off points were proposed for identifying depressive (9 points) and anxious (10 points) symptoms, as well as general symptoms (18 points). These findings support the validity and reliability of the Russian adaptation of HADS and recommend its use in clinical practice for screening for anxiety and depressive disorders.

Validation in student populations. No studies were identified that specifically addressed the adaptation of the Russian HADS for student populations. However, several studies have utilized an existing adaptation of the questionnaire in order to examine student samples. For example, one study conducted among 404 first-year medical students employed the HADS in conjunction with the Zung Self-Rating Anxiety Scale [12]. Another study found that levels of anxiety and depression among students increased during distance learning, potentially impacting their ability to assimilate educational material [13]. Furthermore, a study conducted among first- and sixth-year medical students revealed a high prevalence of anxiety and depression [14]. Subclinical anxiety was detected in 20.68 % of participants, and clinical anxiety in 18.62 %. Subclinical depression was observed in 15.16 % of students, and clinical depression in 7.59 %. These results underscore the need for regular monitoring of the psychoemotional well-being of medical students. Overall, the aforementioned studies support the need to validate and evaluate the psychometric characteristics of the method using student samples.

Psychometric properties of the Russian-language adaptation of the HADS. The psychometric characteristics of the Russian-language adaptation of the HADS demonstrate a level of comparability with other adaptations. One key indicator of reliability is internal consistency, which was assessed using the Cronbach's alpha coefficient. The values typically range from 0.77 to 0.85 for both the anxiety and depression subscales, which is consistent with the results of other studies [15]. Furthermore, factor analysis has confirmed that the Russian adaptation of the HADS retains the original two-dimensional structure with separate components for anxiety and depression. This finding is supported by other research [16]. Additionally, studies have indicated that the commonly used cutoff value of ≥ 8 can be applied to the general population of Russian speakers. However, there is some evidence that suggests the need for slight adjustments depending on demographic or clinical factors [17].

Problems with previous research. Previous studies on the HADS among Russian-speaking populations primarily focused on clinical samples and specific subgroups. It is important to note that the stressors experienced by students which can lead to anxiety and depression development include not only general stressors common to all age groups (such as economic crises, loss of loved ones, and moving to a new residence), but also specific stressors unique to students (such as academic workload, adjusting to university life, interactions with professors,

and peers). Therefore, methods for assessing anxiety, depression, and stress among students may have specific characteristics that require further validation. The current study aims to fill this gap by thoroughly evaluating the psychometric properties of the HADS scale among Russian-speaking student populations.

THE AIM OF THE STUDY

To evaluate the psychometric characteristics, including the factor structure, internal consistency, and external validity, of the HADS among Russian-speaking students. The study aimed to analyze the questionnaire's factor structure, assess its external validity and reliability, and investigate differences across gender, age, years of study, and levels of education.

METHODS

Sample. The initial sample consisted of 1,202 observations. After eliminating missing values, 1,047 observations were retained. Following the exclusion of observations based on reaction times and a Mahalanobis distance test, 908 observations remained. After eliminating implausible ages (< 0) and study years (> 10), as well as uncertain ages, 891 students remained in the sample. The final sample consisted of 891 individuals, of which 198 (22 %) were male and 693 (78 %) were female. The participants' ages ranged from 16 to 37 years, with a mean of 19.8 and a median of 19 years. The standard deviation was 2.13 years. Among the sample, 350 (39 %) were first-year students, 217 (24 %) were second-year students, 189 (21 %) were third-year students, 108 (12 %) were fourth-year students, 19 (2.1 %) were fifth-year students, and 8 (1 %) were sixth-year students; 527 (59 %) of the students were enrolled in bachelor's degree programs, 323 (36 %) in master's programs, 40 (4 %) in specialist programs, and one (0.1 %) was a graduate student; 886 (99 %) of students were studying on a full-time basis, 5 (0.5 %) on a part-time basis; 539 (60 %) of students studied technical specialties (STEM), 288 (32 %) studied humanities, and 64 (7 %) studied natural sciences or other fields; 621 (70 %) of the participants resided in Belgorod and 270 (30 %) in Yekaterinburg. All participants provided informed consent to participate in the study. The project was approved by the Ethics Committee of the Ural Federal University (Protocol No. 4, dated September 20, 2023). Testing was conducted at the end of the second semester of the academic year (May–June).

Questionnaires. The Hospital Anxiety and Depression Scale (HADS), developed in 1983 [1] and validated on a sample of Russian speakers [1, 11], consists of 14 items and 2 subscales (each containing 7 items): depression and anxiety.

Statistical analysis. Statistical analysis was performed using Python 3.11 and R 4.4.1. The nonparametric Mann – Whitney test was used to compare differences in HADS prevalence between gender and age groups. Spearman's correlation coefficient was employed to assess the association between the HADS subscales and the external validity of the instrument. The Cronbach's alpha coefficient was used to evaluate the internal consistency of the HADS and its subscales. Confirmatory factor analysis (CFA) using the DWLS estimator was conducted to examine the factor structure of the HADS.

RESULTS

Principal component analysis

A principal component analysis was conducted to assess preliminarily the number of factors present in the questionnaire. Based on the scree plot, a two-factor model was identified as the most appropriate (Fig. 1).

To analyze the distribution of items across factors, we present the factor loadings are presented in Table 1.

As can be seen from Table 1, items 1–5 and 7 are part of Factor 1, whereas items 8–10 and 12–14 belong to Factor 2. Item 6 does not reach the 0.3 threshold for factor loadings and, therefore, cannot be assigned to either factor. Consequently, it has been decided to exclude this item from the factor analysis. Item 11 has factor loadings that are similar for both factors. Theoretically, this item should belong to Factor 2 (depression scale), but its factor loading is somewhat biased towards Factor 1 (anxiety scale).

Confirmatory factor analysis (CFA)

Confirmatory factor analysis was used to validate and refine the factor structure of the model. The DWLS estimator was employed in the CFA. The two-factor model with correlated factors demonstrated acceptable fit indices (Table 2).

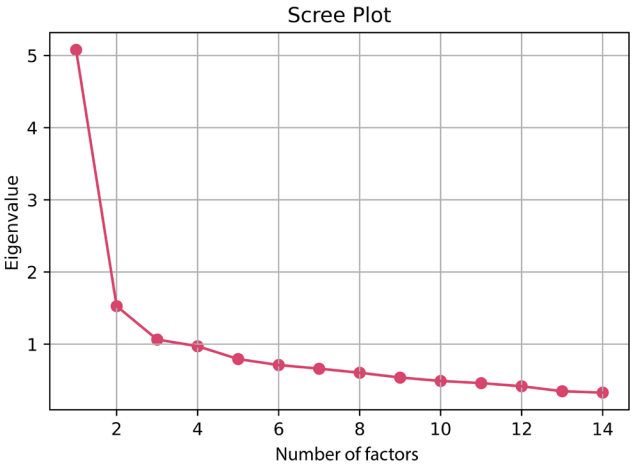

FIG. 1.
Results of principal component analysis for the Hospital anxiety and depression scale (HADS)

For the two-factor model excluding item 6 from the Anxiety scale, there was a slight increase in the RMSEA and SRMR values (indicating a worsening of model fit), but the overall model quality remained within acceptable limits. The TLI and CFI values remained unchanged from the original model. The two-factor model excluding item 6 of the Anxiety scale and 2 items of the Depression scale outperformed the model excluding item 6 of the Anxiety scale across all fit criteria. Compared to the original model, which included all items, this model demonstrated improved TLI and CFI values, but worse RMSEA and SRMR values. Based on these findings, it was decided to proceed with validating the model excluding item 6. Item 11 was assigned to the Anxiety scale.

Descriptive statistics

Next, descriptive statistics were analyzed. General descriptive characteristics are presented in Table 3. Frequency distribution histograms and box plots are presented in Figure 2. The distribution of anxiety, depression, and HADS total scores is skewed towards lower values, which reflects the normative nature of the study population.

Descriptive statistics by gender

Statistically significant gender differences were observed in HADS Anxiety Scale scores. Female participants demonstrated higher scores compared to male participants ($p = 0.020$). No statistically significant differences were observed in the HADS total score or depression scale (Table 4, Fig. 3).

TABLE 1

FACTOR LOADINGS OF HADS ITEMS FOR PCA

№ of the item	Factor 1	Factor 2
1	0.748	0.227
2	0.725	0.192
3	0.775	0.212
4	0.557	0.352
5	0.711	0.196
6	0.151	0.008
7	0.667	0.222
8	0.065	0.592
9	0.063	0.388
10	0.419	0.487
11	0.389	0.378
12	0.190	0.410
13	0.239	0.664
14	0.122	0.500

Note. Initially, items 1–7 were classified as belonging to the Anxiety subscale, and items 8–14 were classified as belonging to the Depression subscale.

TABLE 2

FIE INDICES FOR DIFFERENT VARIANTS OF 2-FACTOR MODELS

Model	TLI	CFI	RMSEA	SRMR
Two-factor model Factor 1: Items 1–7 Factor 2: Items 8–14				
Initial two-factor model (including all items)	0.984	0.987	**0.058** [0.051; 0.065]	0.057
Two-factor model excluding item 6	0.984	0.987	0.062 [0.055; 0.070]	0.059
Two-factor model excluding item 6 and item 9	**0.987**	**0.990**	0.060 [0.052; 0.068]	**0.055**
Two-factor model excluding item 6 and item 11	**0.985**	**0.988**	0.061 [0.053; 0.069]	**0.056**
Two-factor model Factor 1: Items 1–7, 11 Factor 2: Items 8–10, 12–14				
Two-factor model excluding item 6	0.978	0.982	0.073 [0.066; 0.081]	0.067

Descriptive statistics by year of study

Statistically significant differences were observed between students in their first and second years of study (early-year students) and those in their third to sixth years (later-year students). Early-year students exhibited higher scores on the HADS total score, anxiety subscale, and depression subscale (Table 5, Fig. 4).

Descriptive statistics by education level

Statistically significant differences were observed between undergraduate students and other groups of students (specialists, master's students, and doctoral candidates) in terms of the HADS total score and depression scale. Undergraduate students demonstrated higher scores (Table 6, Fig. 5).

Correlations between subscales

Correlations between subscales were calculated. The HADS total score and each of its subscale scores demonstrated statistically significant positive correlations with each other (Table 7).

Internal consistency

An internal consistency analysis was also conducted. The Cronbach's alpha coefficient was 0.73 for the anxiety scale, 0.62 for the depression scale, and 0.79 for the HADS total score.

External validity

External validity was assessed through correlations with the Perceived Stress Scale (PSS) and the Mental Toughness Questionnaire (MTQ) [18]. The Cronbach's alpha coefficient for the MTQ in our sample was 0.77. The correlation between the HADS total score and the PSS total score was 0.72 ($p < 0.001$). The correlation between the HADS anxiety scale and the PSS was 0.73 ($p < 0.001$), and between the HADS depression scale and the PSS was 0.52 ($p < 0.001$). The correlation between the HADS total score and the MTQ was -0.61 ($p < 0.001$), between the HADS anxiety scale and the MTQ was -0.57 ($p < 0.001$), and between the HADS depression scale and the MTQ -0.49 ($p < 0.001$).

DISCUSSION

A preliminary statistical analysis of the data collected from students who completed the Hospital

TABLE 3

GENERAL DESCRIPTIVE STATISTICS FOR THREE SCALES OF HADS

	Mean	Standard deviation	Median	Q1	Q3	Min/max
HADS total score	10.90	6.45	10.0	6.0	15.0	0/35
HADS-A	5.89	3.87	5.0	3.0	8.0	0/18
HADS-D	5.03	3.47	4.0	3.0	7.0	0/18

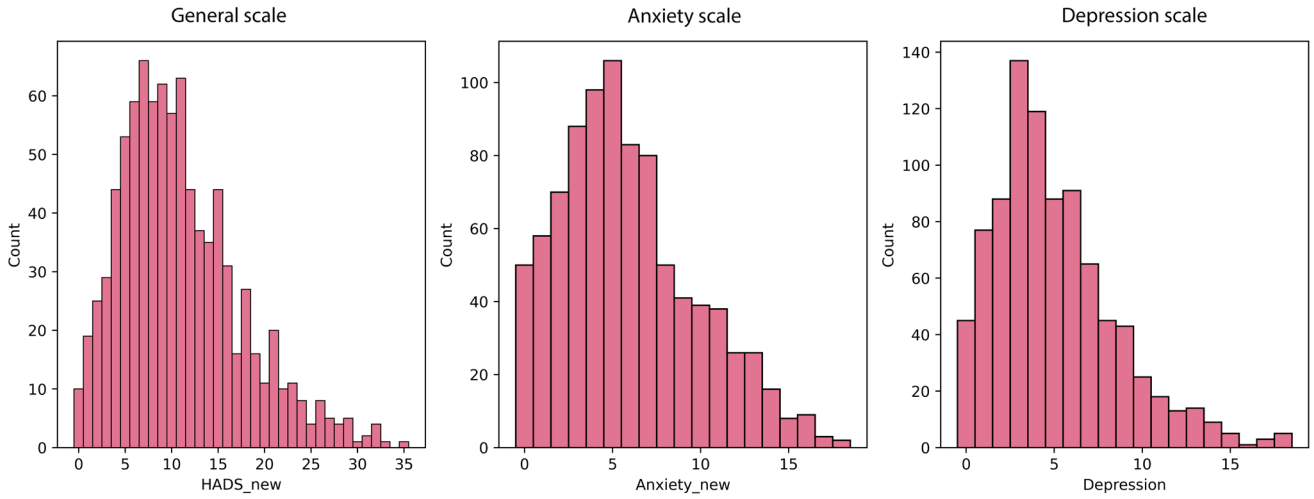

FIG. 2.

Histograms of the distribution of response frequencies for Anxiety, Depression and General scale of HADS. Vertical axis (Count) – frequency of responses; horizontal axis (Anxiety_new, Depression or HADS_new) – sum of scores of the corresponding scale.

Anxiety and Depression Scale questionnaire has allowed us to identify several key statistical indicators and examine the distribution patterns of anxiety and depressive symptoms. The analysis revealed that the anxiety and depression scores tend to be skewed towards lower values, which is consistent with the findings in a normative group [19].

A psychometric analysis of the HADS assessed the reliability, factor structure, and age and gender differences of the test. Cronbach's alpha was 0.73 for the anxiety subscale, 0.62 for the depression subscale, and 0.79 for the total questionnaire. Principal components analysis confirmed the structure of the questionnaire's conformity to the original two-factor model proposed by the authors. Item 6 demonstrated a low factor load, while item 11 was distributed equally across both factors. Confirmatory factor analysis allowed us to evaluate different models: the complete model and the simplified model (excluding item 6) demonstrated comparable fit indices. Based on the comparison of the results from principal components analysis and confirmatory factor analysis, we decided to eliminate item 6 and assign item 11 to factor 2. Therefore, the proposed structure of the questionnaire differs from the theoretical model only by the absence of item 6. A possible explanation for the low factor loadings of item 6 (I cannot sit still; I need to constantly move) may be that difficulties with persistence can be observed not only in cases of anxiety disorders, but also in other conditions (for example, attention deficit hyperactivity disorder and manic episodes).

It should be noted that international adaptations of the HADS have revealed cross-cultural differences in its structure. For example, a 2019 study (pre-COVID-19) using a sample from Poland found that the average anxiety level was 7.19 and depression level was 4.63. In our own sample these levels were 7.44 and 5.24, respectively [20]. In that study, the sixth and ninth items loaded on the "Anxiety" and "Depression" factors, respectively. However, this factor structure was not replicable in other studies using different samples. Another adaptation of the HADS, using an Indonesian sample of 200 individuals aged 18–30 years (including only 8 students), also showed a mixed

TABLE 4

DESCRIPTIVE STATISTICS BY GENDER AND GENDER DIFFERENCES

	Males		Females		Differences (M-F)	*p*-value (Mann–Whitney test)
	M	Sd	M	Sd		
HADS total score	10.79	6.85	10.94	6.33	-0.14	0.41 (67438)
Anxiety	5.41	4.12	6.02	3.78	-0.61	0.02 (62585)
Depression	5.36	3.67	4.94	3.41	0.41	0.24 (73900)

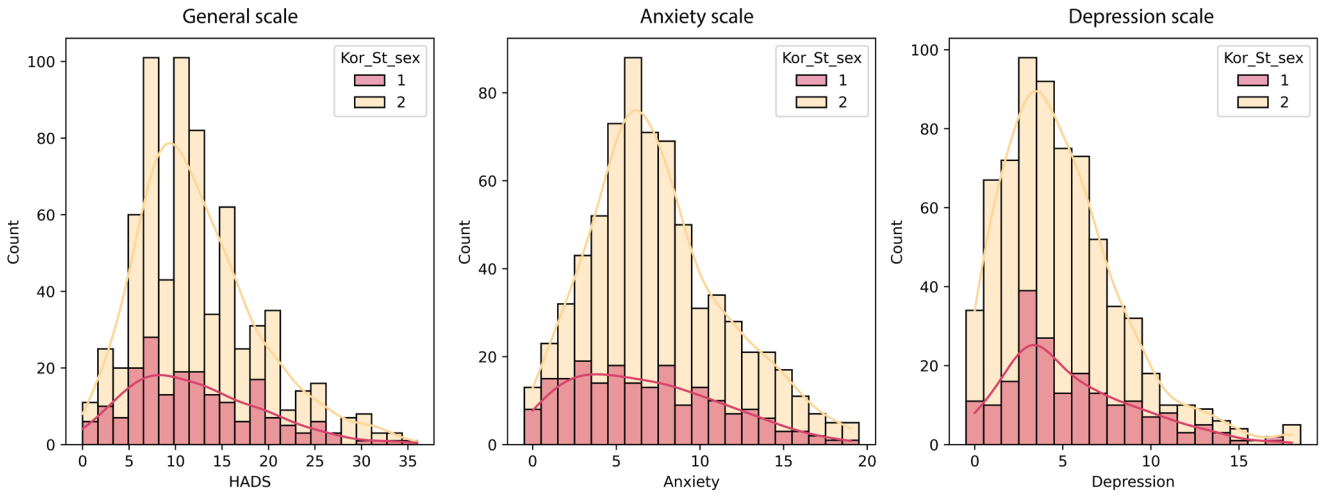

FIG. 3.

Histograms of the distribution of response frequencies for Anxiety, Depression and General scales of HADS by gender (1 – male – red; 2 – female – yellow). Vertical axis (Count) – frequency of responses; horizontal axis (Anxiety, Depression or HADS) - sum of scores of the corresponding scale

structure where the anxiety and depression items were distributed across two factors and does not correspond to the original English version [21]. The Cronbach's alpha coefficients for the anxiety and depression subscales were 0.80 and 0.85, respectively.

Our study revealed significant gender differences in anxiety levels, with women reporting higher average scores than men. This is consistent with previous research on anxiety [22]. Generally, women and girls tend to experience higher levels of anxiety [23], both as a stable personality trait and in specific situations, such as academic anxiety [24]. The prevalence of extreme manifestations associated with anxiety disorders is also higher among women, which can be attributed to biological [25] and social factors. Specifically, in cultures where it is more socially acceptable for women to discuss mental health issues, they are more likely to seek professional help, compared to men, who may provide socially desirable responses in psychological assessments [26].

Statistically significant differences in anxiety and depression levels between early-year students (1st–2nd years of study) and later-year students (3rd–6th years of study) suggest that age and educational level influence these factors. High scores on the HADS among early-year students may be due to their adaptation to a new academic environment, a lack of experience with stress management, and uncertainty about their future. In contrast, decreased anxiety and depression among later-year students can be explained by their development of coping strategies, increased social support, and a clearer understanding of their career prospects. These results are consistent with previous research indicating that anxiety levels are higher among younger students [27, 28].

Statistically significant differences in the HADS total score and depression scale between undergraduates, specialists, master's students, and doctoral candidates reveal significant differences in depression and anxiety levels. These findings highlight the unique challenges faced by undergraduate students. Higher rates of anxiety and depression among undergraduates may be attributed to several factors, including uncertainty about their future career paths, less developed coping strategies, and increased academic workload compared to more experienced students. In contrast, older students typically

TABLE 5

DESCRIPTIVE STATISTICS BY COURSE AND COURSE DIFFERENCES

	Early years of study (1-2)		Later years of study (3-6)		Differences (E-L)	*p*-value (Mann–Whitney test)
	M	Sd	M	Sd		
HADS total score	11.42	6.54	9.10	6.17	1.43	<0.001 (108178)
Anxiety	6.16	3.96	5.41	3.65	0.74	0.005 (105743)
Depression	5.27	3.47	4.58	3.42	0.69	0.001 (105743,5)

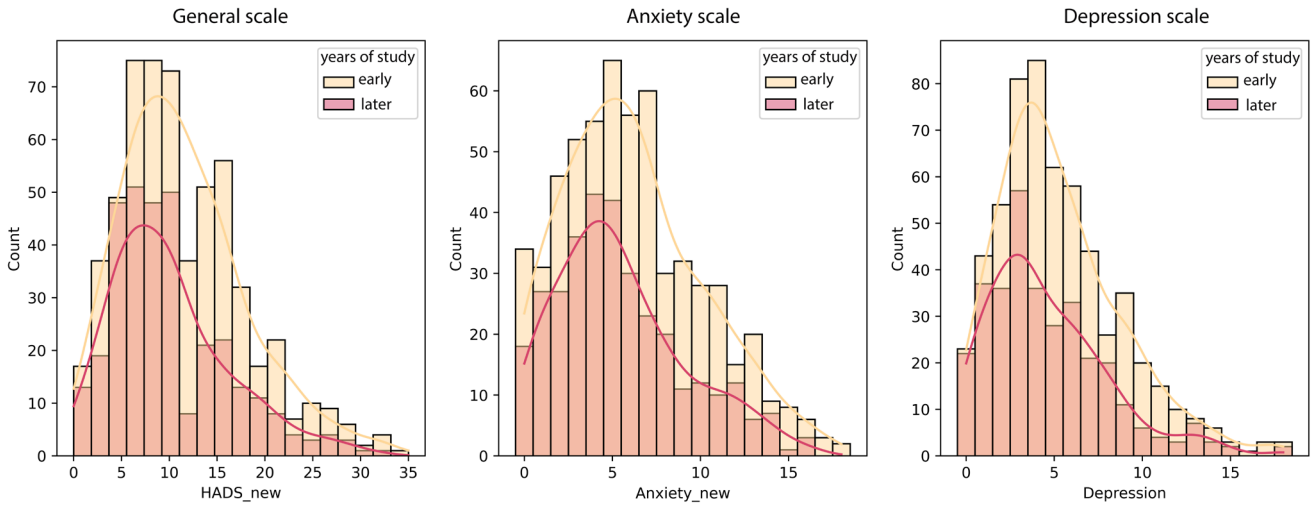

FIG. 4.

Histograms of the distribution of response frequencies for Anxiety, Depression and General scales of HADS by course (junior – yellow; senior – red). Vertical axis (Count) – frequency of responses; horizontal axis (Anxiety_new, Depression or HADS_new) – sum of scores of the corresponding scale

have more defined career goals, better stress management skills, and stronger social support networks. These findings corroborate previous research on the higher prevalence of psychological distress among undergraduates. For instance, N. Bayram and N. Bilgel (2008) reported that undergraduate students were more likely to experience anxiety and depression compared to graduates, likely due to a combination of academic, financial, and social pressures [29]. H.M. Stallman (2010) identified undergraduate students as a high-risk group for mental health issues, emphasizing the need for targeted psychological interventions [30].

External validity analysis using correlations with the PSS and the MTQ confirmed the reliability of the HADS. High positive correlations between the HADS and the PSS (r = 0.72) and between the HADS Anxiety Scale and the PSS (r = 0.73) indicate the sensitivity of the HADS to stress. Negative correlations between the HADS and the MTQ (ranging from -0.48 to -0.61) suggest a link between psychological distress and resilience,

TABLE 6

DESCRIPTIVE STATISTICS BY STAGE OF EDUCATION AND DIFFERENCES BETWEEN STAGES OF EDUCATION

	Bachelor's students		Others		Differences (B-O)	*p*-value (Mann–Whitney test)
	M	Sd	M	Sd		
HADS total score	11.30	6.63	10.34	6.14	0.96	0.036 (107765.5)*
Anxiety	6.06	3.98	5.64	3.69	0.42	0.11 (105730)
Depression	5.24	3.48	4.70	3.42	0.54	0.016 (108915)*

TABLE 7

CORRELATIONS BETWEEN SUBSCALES OF HADS

	HADS total score	HADS-Anxiety	HADS-Depression
HADS total score	1		
HADS-Anxiety	0.81 ($p < 0.001$)	1	
HADS-Depression	0.86 ($p < 0.001$)	0.48 ($p < 0.001$)	1

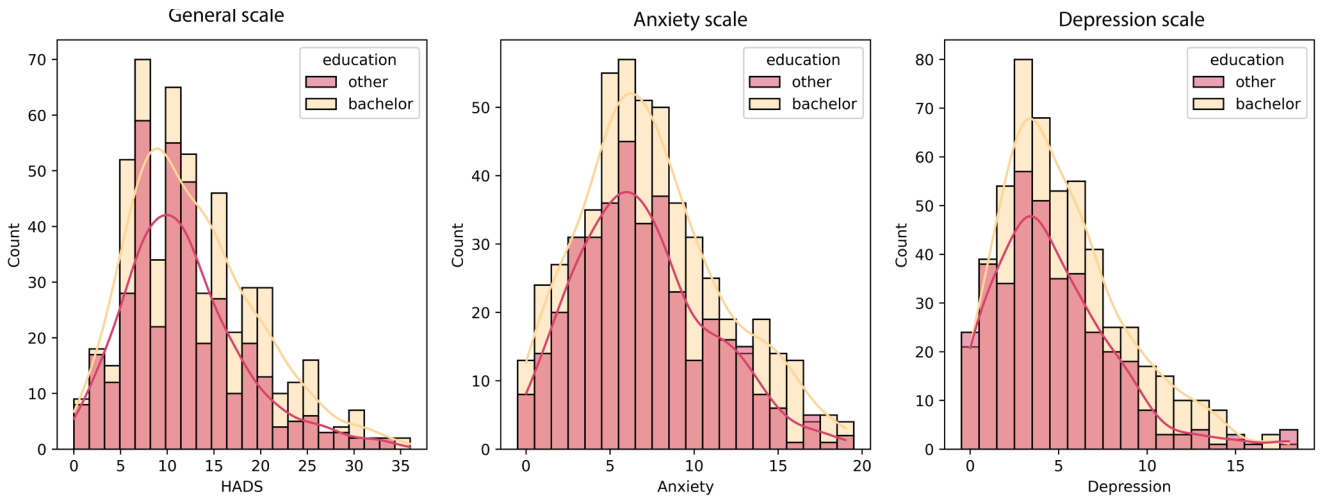

FIG. 5.

Histograms of the distribution of response frequencies for Anxiety, Depression and General scales of HADS by stage of education (bachelor – yellow; other – red). Vertical axis (Count) – frequency of responses; horizontal axis (Anxiety, Depression or HADS) – sum of scores of the corresponding scale

which is associated with stability and the ability to cope with stress. A more pronounced negative correlation with the HADS Anxiety Scale (r = -0.57) suggests that resilience may be more closely related to anxiety than depressive symptoms. These results are consistent with the existing literature on the PSS and the MTQ as measures of stress and resilience. For example, S. Cohen et al. (1983) identified the PSS as a reliable measure of perceived stress that correlates with anxiety and depression [31]. Similarly, P.J. Clough et al. (2002) showed an inverse relationship between the MTQ and psychological distress, highlighting its role in promoting mental well-being [32].

CONCLUSION

The HADS is a reliable and validated instrument for assessing anxiety and depression among young people. This study confirms that the Russian adaptation of the HADS has good reliability and validity, maintaining its utility for screening anxiety and depressive symptoms in students, given its identified factor structure. The exclusion of item 6 from the factor analysis is advantageous, as it enhances the psychometric properties of the scale, including its external validity, as demonstrated by correlations with other established measures of stress and resilience, such as the PSS and MTQ. These findings indicate that the HADS can be used to assess stress-related traits, anxiety, and depression, as well as to detect mental health issues in student populations. Its ease of use and clarity make it a valuable tool for early detection and intervention, as mental health problems are often undetected in this population.

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Conflicts of interest

The authors declare no conflicts of interest.

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