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VALIDATION OF THE KAZAKH VERSION OF THE DEPRESSION ANXIETY STRESS SCALE (DASS-21) IN MEDICAL FACULTY STAFF SAMPLE: THE PILOT STUDY

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Summary

Background. According to the IHME data, 1 in 10 people in Kazakhstan suffer from mental disorders, predominantly depression and anxiety. Numerous studies of academic medicine have shown that faculty experience higher rates of psychological distress compared with the general population.

Aim. To assess the psychometric reliability of the DASS-21 and its applicability in Kazakh academic faculty sample.

Materials and methods. The study was conducted in May 2021 at Semey Medical University. The DASS-21 was selected for the current validation study. The validation procedure was performed in accordance with the WHO guidelines on translation and adaptation of instruments and committed in 3 phases, which included forward translation, discussion, and back translation. The Kazakh version of the DASS-21 was applied to the pilot group of 30 volunteers.

Results. The vast majority of the responders were females (73.33%). The mean age was 38.17. Overall Cronbach's alpha for the DASS-21 obtained 0.898. Cronbach's alphas for the subscales of depression, anxiety, and stress were 0.743, 0.847, and 0.747, respectively. Test-retest reliability as measured in ICC was 0.712 for depression, 0.761 for anxiety, and 0.715 for stress subscales.

Conclusions. Our study supports the psychometric properties of the DASS-21 and recommends it as a suitable tool for screening general symptoms of depression, anxiety, and stress.

Keywords: validation, psychometric properties, depression, anxiety, stress.

Резюме

ВАЛИДИЗАЦИЯ КАЗАХСКОЙ ВЕРСИИ ОПРОСНИКА DEPRESSION ANXIETY STRESS SCALE (DASS-21) СРЕДИ ПРОФЕССОРСКО-ПРЕПОДАВАТЕЛЬСКОГО СОСТАВА МЕДИЦИНСКИХ УНИВЕРСИТЕТОВ: ПИЛОТНОЕ ИССЛЕДОВАНИЕ

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Введение. По данным IHME, каждый десятый человек в Казахстане страдает психическими расстройствами, преимущественно депрессией и тревожностью. Многочисленные исследования в области академической медицины показали, что преподаватели испытывают более высокий уровень психологического дистресса по сравнению с населением в целом.

Цель. Оценка психометрической надежности DASS-21 и ее применимости к выборке казахстанских преподавателей.

Материалы и методы. Исследование проводилось в мае 2021 года в Медицинском университете Семей. Шкала DASS-21 была использована в качестве инструмента для пилотного исследования. Процедура валидации проводилась в соответствии с рекомендациями ВОЗ по переводу и адаптации инструментов и состояла из 3 этапов, включая прямой перевод, обсуждение и обратный перевод. Казахская версия DASS-21 была апробирована на пилотной группе из 30 добровольцев.

Результаты. Подавляющее большинство респондентов принадлежали женскому полу (73,33%). Средний возраст опрошенных составил 38,17. Общая альфа Кронбаха по шкале DASS-21 составила 0,898. Альфа Кронбаха для подшкал депрессии, тревоги и стресса составила 0,743, 0,847 и 0,747, соответственно. Тест-ретестовая надежность составила 0,712 для депрессии, 0,761 для тревожности и 0,715 для стресса.

Выводы. Наше исследование подтверждает психометрические свойства DASS-21 и рекомендует в качестве подходящего инструмента для выявления общих симптомов депрессии, тревожности и стресса.

Ключевые слова: валидизация, психометрические свойства, депрессия, тревожность.

Түйіндеме

МЕДИЦИНАЛЫҚ УНИВЕРСИТЕТТЕРДІҢ ПРОФЕССОРЛЫҚ-ОҚЫТУШЫЛЫҚ ҚҰРАМЫ АРАСЫНДА DEPRESSION ANXIETY STRESS SCALE (DASS-21) САУАЛНАМАСЫНЫҢ ҚАЗАҚША НҰСҚАСЫН ВАЛИДИЗАЦИЯЛАУ: ПИЛОТТЫҚ ЗЕРТТЕУ

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Кіріспе. ІНМЕ мәліметтері бойынша, Қазақстанда 10 адамның 1-і психикалық бұзылулардан, негізінен депрессия мен мазасыздықтан зардап шегеді. Академиялық медицина саласындағы көптеген зерттеулер көрсеткендей, оқытушылар жалпы халықпен салыстырғанда психологиялық күйзелістің жоғары деңгейіне ие.

Мақсаты. Біздің зерттеуіміз DASS-21 психометриялық сенімділігін және оның қазақстандық оқытушылар іріктемесінде қолданылуын бағалауға бағытталған.

Материалдар мен әдістері. Зерттеу 2021 жылдың мамырында Семей медициналық университетінде жүргізілді. DASS-21 шкаласы пилоттық зерттеу құралы ретінде пайдаланылды. Валидизация рәсімі ДДҰ-ның құралдарды аудару және бейімдеу жөніндегі ұсынымдарына сәйкес жүргізілді және тікелей аударма, талқылау және кері аударманы қоса алғанда, 3 кезеңнен тұрды. DASS-21 қазақ нұсқасы 30 еріктіден тұратын пилоттық топта сыналды.

Нәтижелері. Сауалнамаға қатысқандардың орташа жасы 38,17 құрады. DASS-21 шкаласы бойынша жалпы Кронбах альфасы 0,898 құрады. Депрессия, мазасыздық және стресстің кіші шкаласы үшін Кронбах альфасы сәйкесінше 0,743, 0,847 және 0,747 құрады. Тест-ретест сенімділігі депрессия үшін 0,712, мазасыздық үшін 0,761 және стресс үшін 0,715 болды.

Қорытынды. Біздің зерттеу DASS-21 психометриялық қасиеттерін растайды және оны депрессия, мазасыздық және стресстің жалпы белгілерін анықтауға арналған дұрыс құрал ретінде ұсынады.

Түйінді сөздер: валидизация, психометриялық қасиеттер, депрессия, мазасыздық, стресс.

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Introduction

Mental health is remaining one of the growing concerns for recent decades. The Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) 2019 highlighted that depressive and anxiety disorders were the most disabling conditions globally, ranking among the top 25 leading causes of burden and persisting high for both sexes [8]. According to the Institute for Health Metrics and Evaluation (IHME) data, 1 in 10 people in Kazakhstan suffers from mental disorders, predominantly depression and anxiety [11]. Nevertheless, due to low mental health literacy and rigid cultural beliefs and patterns that formulated a strong stigma against mental illnesses, the problem remains neglected and concealed. As a result, 70% of mental disorder cases stay untreated globally, but in developing countries, this proportion is marginally higher than 85% [31].

Numerous studies of academic medicine have shown that academic faculty experience higher rates of psychological distress compared with the general population. A tremendous workload, multiple duties in academia, and overwhelming research deadlines under pervading stress made the profession one of the most emotionally demanding [13, 14].

The major COVID-19 outbreak has had an unpredictable and drastic impact on mental health that, however, differed across nations and regions [21]. In Kazakhstan, the pandemic triggered a more than 30% increase in the prevalence of major depressive disorder and anxiety disorder [6]. United Nations (UN) health agency's report suggested that mental health deterioration was primarily associated with unprecedented stress due to social isolation, suffering and deaths in a family, and financial instability [28]. Academic medicine faculty were in particular affected by forceful changes in their everyday routine [17]. Most of them, especially clinicians and epidemiologists, worked in the frontline, exceeding daily working hours, which was allied with a fear of disease. Along with this, medical faculty struggled with multiple challenges such as school closures, poor technical supply, limited internet connection, and difficulties in using digital equipment, primarily for older faculty [9]. The global disruption caused by the pandemic revealed huge gaps in mental health services, which required to be addressed. In this respect, the availability of valid tools for screening symptoms of psychological distress, which may be used in various socio-demographic groups, is of great importance.

The Depression Anxiety Stress Scale (DASS-21) developed by Peter Lovibond and Sydney Harold Lovibond in 1995 [15] is considered to be a unique instrument measuring the emotional states of depression, anxiety, and stress. The tripartite model of distress suggested by Clark and Watson [5] in the early 1990s evolved from the considerable body of knowledge that these conditions often coincide and overlap, although conceptually are distinct. Anxiety and depression self-report measures commonly correlate between 0.4 and 0.7 across different samples, which hinders the discrimination between them. Therefore, the DASS-21 was aimed to provide maximum discrimination between distress dimensions. The great advantage of the

DASS-21 is that the scale was developed in non-clinical samples and is capable of measuring general negative affective syndromes [15].

Currently, the DASS-21 has been translated and validated into more than 50 languages, including Arabic [1], Turkish [24], Greek [23], Chinese [16], Brazilian Portuguese [29], and Persian [12]. Both English and non-English versions demonstrated high internal consistency (Cronbach's alpha of >0.70). The original DASS-21 subscales' internal consistencies were 0.91 for depression, 0.84 for anxiety, and 0.90 for stress. The psychometric properties and reliability of the DASS-21 have been confirmed in both clinical and non-clinical settings.

Prior studies have identified a significant correlation with other instruments aimed at measuring depression, anxiety, and stress, including Beck Anxiety Inventory ($r=0.81$), Beck Depression Inventory ($r=0.76$) [15], Mood and Anxiety Symptom Questionnaire ($r=0.73$) [20], Patient Health Questionnaire ($r=0.71$), General Anxiety Disorder ($r=0.61$) [22], Scale of Positive and Negative Experience ($r=0.65$) [2], Hospital Anxiety and Depression Scale [19], and Edinburgh Postnatal Depression Scale ($r=0.61$) [18].

To date, the DASS-21 has no analogs among the existing measures for evaluating the symptoms of psychological distress. It can evaluate and differentiate multiple domains and psychometrically relevant in English and non-English populations. However, the questionnaire has not been translated into any of the Turkic languages (except Turkish, which belongs to another branch of the language family), and hence has not been adapted to the sociocultural context of Central Asian countries. Therefore, our study aimed to assess the psychometric reliability of the DASS-21 and its applicability in the Kazakh academic faculty sample.

Materials and Methods

Study settings and population

The study was conducted in May 2021 at Semei Medical University. The study involved 30 volunteers, as recommended by In [10]. The participants for the pilot study were recruited from the target population, to which the instrument will be applied. Eligibility criteria included 1) current position of the faculty staff, 2) being fluent in Kazakh, and 3) the absence of mental illnesses.

Ethical considerations

The present study obtained approval from the Local Ethics Committee (Protocol #2, dated October 28, 2020). The participants were informed about the purpose of the study, their rights and duties, and the ability to withdraw at any moment during the study. The volunteers were provided with the contact number of the principal researcher in case of difficulties in filling out the form. An informed consent form was sent to participants prior to data collection.

Measure

The DASS-21 was selected for the current validation study. This self-report instrument is derived from the original DASS-42 and consolidates 3 dimensions of distress. The shortened scale comprises 21 items, 7 in each subscale. Each item constituted the statement and scored on a Likert four-point scale from 0 (Did not apply to me at all) to 3 (Applied to me very much or most of the time). Each item is answered in terms of the applicability of individual symptoms of depression (DASS-D), anxiety (DASS-A), and

stress (DASS-S) over the past week. The DASS-D subscale evaluates loss of self-esteem, hopelessness, dysphoria, despair, and inertia. The DASS-A assesses the acute response of fear, such as panicking, trembling, breathing difficulties, ponding of the heart, and worrying about losing control. The DASS-S subscale focuses on persistent arousal and tension, irritability, nervousness, inability to relax, and intolerance to interruption. The final result is ranging from 0 to 21, where the higher scores indicate a higher symptomatology of distress.

Procedures

Initially, we addressed the developer of the DASS-21 scale Peter Lovibond via e-mail and inquired for permission to validate the questionnaire in Kazakhstan. After obtaining permission, we started the process of developing the Kazakh version of the DASS-21. The validation procedure was performed in accordance with the World Health Organization (WHO) guidelines on translation and adaptation of instruments [30] and committed in 3 phases, which included forward translation, discussion, and back translation.

In the first phase, two translators acquainted with the terminology translated the original DASS-21 into Kazakh autonomously from each other. Both specialists were bilingual, but their native language was Kazakh. Two versions were compared and debated by translators for text appropriateness and precision. Therefore, this helped the specialists accede to a single version of the scale (V1). The aim of this phase was not to perform a literal translation but to ensure conceptual equivalence of the text.

In the second phase, the expert panel revised and discussed the V1 to attenuate translation failures and misunderstandings. The expert panel comprised a health professional, a Kazakh linguist, and both translators. This step helped clarify words and expressions used in translation, as well as colloquial phrases and idioms.

In the third phase, the translator unfamiliar with the original scale content but knowledgeable about terminology was requested to perform the back translation of the V1. This was the essential measure to ascertain the meaning was not distorted during translation. Afterward, the final Kazakh version linguistically and semantically consonant to the original scale was approved as V2.

Finally, the approved version of the DASS-21 was applied to the pilot volunteer group to examine the

psychometric equivalence of the instrument in the Kazakh sociocultural context. Participants who noted any statement of the scale as unclear were requested to provide suggestions to paraphrase and rewrite them to make the sentence clearer.

Data analysis

Data were processed and analyzed using the SPSS 23.0 (IBM Corp.) software.

Descriptive statistics were computed to describe the sample characteristics, each DASS-21 subscale, and individual items. Cronbach alpha statistics were applied to evaluate internal consistency for the overall scale and each subscale. The cutoff value of 0.7 was used as a sufficient measure of internal consistency, as recommended by Taber [26]. Individual item-total correlations of the DASS-21 subscales were calculated, which indicate that a given item measures the construct that is associated with, rather than the others.

The temporal stability of the DASS-21 was examined in a two-weeks test-retest study using the intraclass correlation coefficient (ICC) with a two-way random model. The cutoff value of 0.5 was accepted as a moderate correlation, as recommended by Bobak, Barr, and O'Malley [4]. The Bland-Altman plots were used to examine agreement between test and retest studies and identify possible outliers. We calculated the difference scores of depression, anxiety, and stress between both sessions with 95% limits of agreement (LoA₉₅) for each subscale. The LoA₉₅ was calculated by the mean difference (MD) ±1.96 standard deviation (SD) of the differences. As recommended by Bland and Altman [3], we expected 95% of the differences to lie within LoA₉₅ limits.

The significance level was set at p<0.05.

Results

Sample characteristics

Overall, 30 faculty members provided data for the DASS-21. The vast majority of the responders were females (73.33%; n=22). The mean age was 38.17 (SD=9.0; SEM=1.64), ranging from 29 to 58 years.

Internal consistency

The preliminary descriptive statistics including the means, standard deviations, and standard errors of the mean are depicted in table 1.

Table 1.

Preliminary descriptive statistics for the DASS-21 items.

Item	Domain	M	SD
1	2	3	4
I found it hard to wind down	Stress (S1)	0.87	0.63
I was aware of dryness of my mouth	Anxiety (A1)	0.63	0.72
I couldn't seem to experience any positive feeling at all	Depression (D1)	0.57	0.63
I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	Anxiety (A2)	0.47	0.63
I found it difficult to work up the initiative to do things	Depression (D2)	1.20	0.61
I tended to over-react to situations	Stress (S2)	1.00	0.59
I experienced trembling (eg, in the hands)	Anxiety (A3)	0.40	0.72
I felt that I was using a lot of nervous energy	Stress (S3)	1.67	0.92
I was worried about situations in which I might panic and make a fool of myself	Anxiety (A4)	0.63	0.72
I felt that I had nothing to look forward to	Depression (D3)	0.47	0.73
I found myself getting agitated	Stress (S4)	0.97	0.41
I found it difficult to relax	Stress (S5)	0.60	0.68

Continuation of Table 1.

1	2	3	4
I felt down-hearted and blue	Depression (D4)	0.77	0.57
I was intolerant of anything that kept me from getting on with what I was doing	Stress (S6)	0.43	0.50
I felt I was close to panic	Anxiety (A5)	0.77	0.68
I was unable to become enthusiastic about anything	Depression (D5)	0.83	0.59
I felt I wasn't worth much as a person	Depression (D6)	0.67	0.55
I felt that I was rather touchy	Stress (S7)	1.37	0.49
I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)	Anxiety (A6)	0.60	0.68
I felt scared without any good reason	Anxiety (A7)	0.37	0.49
I felt that life was meaningless	Depression (D7)	0.20	0.41

M – mean, *SD* – standard deviation

Overall Cronbach's alpha for the DASS-21 obtained 0.898, which indicated good internal consistency of the scale. Cronbach's alphas for the subscales of depression, anxiety,

and stress were 0.743, 0.847, and 0.747, respectively. Cronbach's alphas for each construct of the DASS-21 ranged from 0.886 to 0.903. Table 2 illustrates the reliability scores.

Table 2.

Reliability scores for the DASS-21 items.

Item	Scale M if item deleted	Scale variance if item deleted	Corrected item-total correlation	α if item deleted
S1	14.60	52.11	0.512	0.894
A1	14.83	48.83	0.777	0.886
D1	14.90	51.20	0.621	0.891
A2	15.00	52.62	0.454	0.895
D2	14.27	52.41	0.495	0.894
S2	14.47	52.33	0.528	0.894
A3	15.07	50.13	0.634	0.890
S3	13.80	51.06	0.398	0.900
A4	14.83	49.11	0.748	0.887
D3	15.00	49.59	0.684	0.889
S4	14.50	53.29	0.611	0.893
S5	14.87	52.74	0.404	0.897
D4	14.70	51.53	0.650	0.891
S6	15.03	53.34	0.483	0.895
A5	14.70	50.98	0.590	0.892
D5	14.63	52.79	0.466	0.895
D6	14.80	55.89	0.118	0.903
S7	14.10	53.27	0.510	0.894
A6	14.87	50.33	0.666	0.889
A7	15.10	54.30	0.362	0.897
D7	15.27	56.34	0.106	0.901

M – mean, α – Cronbach's alpha

Test-retest reliability. The intraclass correlation coefficients (ICC) for the DASS-21 indicated good reliability, with 95% CI for each subscale, and are presented in table

3. The test-retest reliability of the Kazakh version of the DASS-21 was acceptable, with the adequate ICC in all domains, ranging from 0.712 to 0.761.

Table 3.

Intraclass correlation coefficients for the DASS subscales.

DASS-21 dimension	ICC	95% CI	F test	p-value
Depression	0.712	0.478-0.852	5.950	<0.001
Anxiety	0.761	0.556-0.879	7.361	<0.001
Stress	0.715	0.482-0.853	6.016	<0.001

ICC – intraclass correlation coefficient, *CI* – confidence intervals

Bland-Altman plots showed that 95% of all differences lie within the LoA₉₅ limits (Figure 1).

The depression, anxiety, and stress scores contained some outliers but were close to the range limit. The mean difference between the test and retest was -0.27 (95% CI -

1.01-0.47) for depression, 0.53 (95% CI -0.28-1.35) for anxiety, and -0.10 (95% CI -0.89-0.69) for stress subscale. The LoA₉₅ range was 3.62 to -4.15 for the DASS-D, 4.80 to -3.73 for the DASS-A, and 4.03 to -4.23 for the DASS-S.

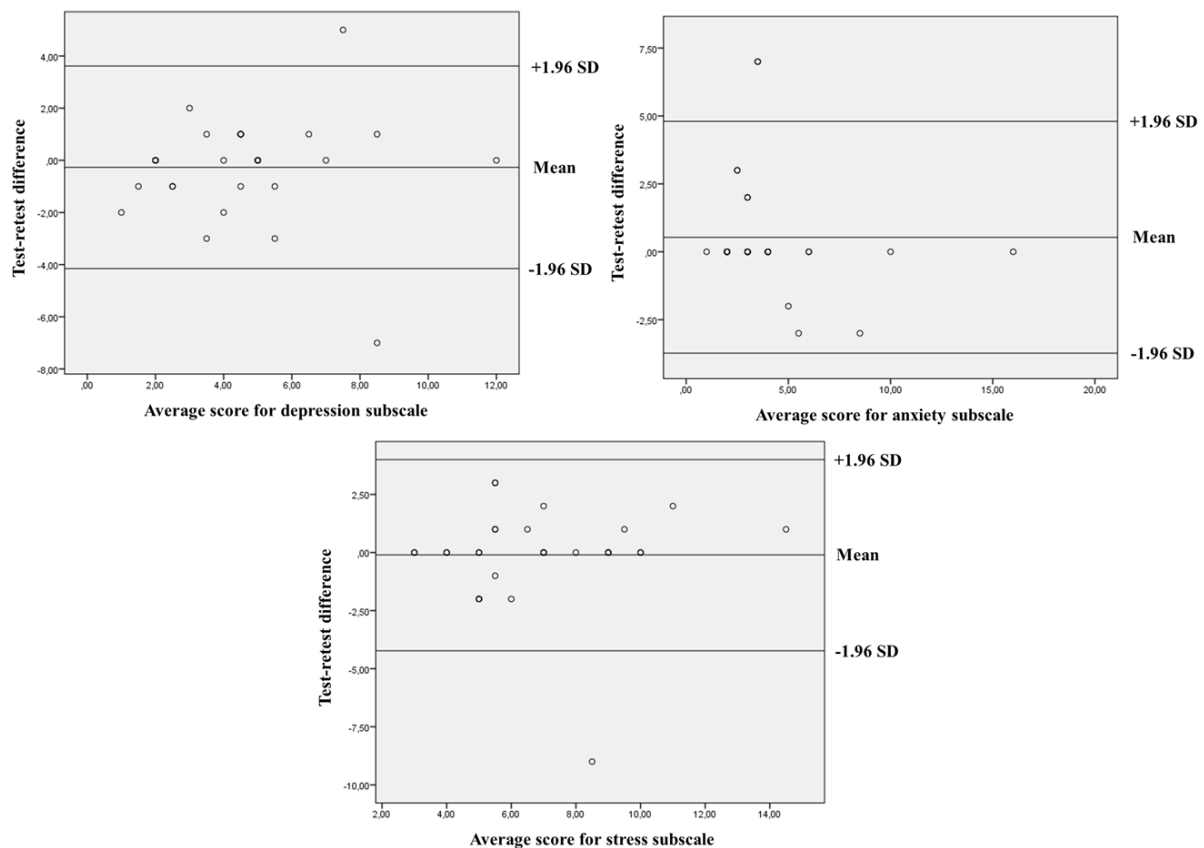


Figure 1. Bland-Altman plots for the different scores in the test-retest study of the DASS-21 subscales.

Discussion

This study aimed to investigate the reliability and validity of the Depression Anxiety Stress Scale among medical faculty staff in Kazakhstan. To the best of our knowledge, this is the first validation study to use the DASS-21 in measuring subjective symptoms of depression, anxiety, and stress in Kazakh sample. Our findings revealed that the Kazakh version of the DASS-21 demonstrated adequate psychometric properties.

We performed the DASS-21 translation into Kazakh following WHO guidelines on translation and adaptation of instruments. The procedure involved bilingual professionals, who translated, discussed, and reconciled the original scale items. This phase aimed to convey the conceptual meaning of each statement, not to perform a word-for-word translation. Hence, due to the absence of equivalent terms in Kazakh, the item written in the original scale as “I felt down-hearted and blue” was translated as “I felt unhappy and frustrated/sad”. The item “I felt I wasn’t worth much as a person” was translated as “I felt I wasn’t valuable as a person”. The original statement written as “I felt that I was rather touchy” was translated as “I felt that I was over-sensitive”.

All ambiguities that arose were resolved during expert panel revision. Thus, the original item “I found myself getting agitated” was modified to “I found myself getting troubled for no reason” due to a dispute on the semantic definition of “agitation” in Kazakh. Accordingly, the Kazakh version which is linguistically and grammatically sound was accepted to apply to the pilot group.

The Kazakh version of the DASS-21 had good internal consistency: the overall Cronbach’s alpha obtained 0.898,

and Cronbach’s alphas for the DASS-D, DASS-A, and DASS-S were 0.743, 0.847, and 0.747, respectively. This is concordant with previous studies in other populations. Internal consistency of the Turkish version of DASS-21 reached 0.85, 0.80, and 0.77 for depression, anxiety, and stress subscales [24]. Cronbach’s alphas for three subscales in Greek sample study were 0.85, 0.84, and 0.84, respectively [23]. A Vietnamese version of the DASS-21 had slightly lower internal consistency – Cronbach’s alpha reached 0.72 for DASS-D, 0.77 for DASS-A subscale, and 0.70 for DASS-S [27].

In the present study, the tool showed good temporal stability: test-retest reliability as measured in ICC was 0.712 for depression, 0.761 for anxiety, and 0.715 for stress subscales. These findings were slightly lower than in the Iranian study (0.75, 0.86, and 0.82, respectively) [12], although higher than in the Turkish study (0.68, 0.66, 0.61, respectively) [24].

The Bland-Altman plot analysis complemented further exploration of the differences. The graphs have displayed that most distributions lie within the upper and lower limits of 95% CI. Similar results were attained by da Silva et al. [25] in the validation study of the Brazilian Portuguese version.

Our study has several limitations that need to be acknowledged. First, the corrected item-total correlation of items D6 and D7 was less than the cutoff value of >0.3, as recommended by Ferketich [7]. This may be explained by the small sample size in the pilot study, which could affect the reliability indices. Further studies with a larger sample size may resolve this issue. Second, the convenience sampling methodology may somewhat limit the

generalizability of the results. The participants were recruited from Semey city, the socioeconomic development of which may differ from more advanced or backward regions, and therefore, their emotional alertness may deviate from those residing elsewhere.

Conclusions

In summary, our study supports the psychometric properties of the DASS-21 in Kazakh academic medicine sample. Despite the limitations, the Kazakh version of the scale demonstrated good internal consistency and temporal stability and is suitable for screening general symptoms of depression, anxiety, and stress. The instrument may be recommended to medical school administrations for developing and correcting the faculty retention policies and maintaining mental well-being.

Author contributions

Uristemova A.K. – Formal analysis, Methodology, Writing – original draft, Writing – review & editing

Myssaev A.O. – Conceptualization, Visualization, Writing – review & editing

Meirmanov S.K. – Data curation, Project administration, Writing – review & editing

Migina L.E. – Formal analysis, Writing – review & editing

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Conflict of interest

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