

# Validation of the Recreational Awareness Scale among ukrainian students under wartime conditions

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Authors' Contribution: A – Study design; B – Data collection; C – Statistical analysis; D – Manuscript Preparation; E – Funds Collection

## Abstract

**Background and Study Aim** Recreational activity contributes to the restoration of psychological balance and social adaptation of students under conditions of military-related stress. During the war in Ukraine, physical and leisure activities are considered important means of maintaining well-being and personal resilience. At the same time, the influence of various forms of recreation implemented in the educational environment on awareness of recreational activity remains an issue of practical interest. The purpose of this study was to assess the level of students' awareness of recreational activity and to examine the psychometric properties of the Ukrainian version of the Recreational Awareness Scale (RAS).

**Material and Methods** The study involved 89 university students from Eastern Ukraine (n = 53) and Western Ukraine (n = 36). All participants were enrolled in programs related to physical education, sports recreation, or health-oriented physical activity. Data were collected online using the Google Forms platform. The survey was conducted between February and March 2025. The Ukrainian adapted version of the Recreational Awareness Scale (RAS) was applied. The questionnaire consisted of 41 items grouped into three aspects: Pleasure/Fun, Social/Success, and Self-improvement. Responses were rated on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Statistical data processing was performed using the Python programming language. Non-parametric methods were applied, with the level of statistical significance set at  $p < 0.05$ .

**Results** Data analysis demonstrated satisfactory reliability and internal consistency of the Recreational Awareness Scale (RAS). High positive correlations were identified among the Pleasure/Fun, Social/Success, and Self-improvement aspects. Pearson correlation coefficients ranged from  $r = 0.82$  to  $0.95$ . All correlations were statistically significant at  $p < 0.001$ . Confirmatory factor analysis confirmed the three-factor structure of the RAS. Model fit indices indicated excellent fit, with CFI = 1.00 and TLI = 1.00. The RMSEA value was 0.00, and SRMR did not exceed 0.01. Standardized factor loadings ranged from 0.86 to 0.99, with all loadings being statistically significant at  $p < 0.001$ . Comparative analysis revealed no statistically significant differences between students from Eastern and Western Ukraine across all RAS aspects. In all cases,  $p$ -values exceeded 0.05. Similar results were obtained when comparing male and female students, with no statistically significant gender differences observed. Analysis of differences between students of different academic years also revealed no statistically significant effects, as all  $p$ -values exceeded 0.05. The findings indicate a comparable level of recreational activity awareness across the analyzed subgroups.

**Conclusions** The Ukrainian version of the Recreational Awareness Scale (RAS) can be used to assess students' awareness of recreational activity. The results indicate comparable levels of recreational awareness regardless of region of residence or gender. Recreational activity may be considered one of the components of students' adaptive processes under wartime conditions.

**Keywords:** awareness of recreational activity, students, recreational activity, psychological resilience, wartime context, psychometric properties

## Introduction

In contemporary conditions, physical and recreational activity is regarded as an important component of maintaining health and psychological balance. For students living under war conditions,

participation in recreational forms of activity acquires particular significance, as it contributes to the reduction of emotional strain, the maintenance of social ties, and the preservation of internal resilience. In this context, recreation represents a multidimensional phenomenon that integrates physical, psycho-emotional, and social components of activity, allowing it to be considered a factor of adaptation and personal well-being under stressful

life conditions.

Fundamental research in the field of psychometric measurement of recreational activity has laid the groundwork for analyzing motivation and awareness of participation in leisure activities. Manfredo, Driver, and Tarrant [1] presented a meta-analysis of the Recreation Experience Preference (REP) scales, substantiating their importance for the systematic study of recreational motives and value orientations. Subsequently, Kim [2] developed the Leisure Adaptation Meanings Scale, demonstrating the role of cultural context in interpreting the meanings of recreational activity. Kim and Cho [3] refined the psychometric properties of the short version of the Leisure Satisfaction Scale (LSS) by applying Rasch model calibration to enhance measurement accuracy and reliability.

Further research attention was directed toward adapting psychometric instruments to conditions of increased stress and socio-political instability. Regnoli et al. [4] conducted a validation of the Media Vicarious Traumatization Scale on an Italian sample, while Frankova et al. [5] confirmed the reliability of the Ukrainian version of the Continuous Traumatic Stress Response (CTSR) scale under war conditions. Taken together, these studies emphasize the importance of culturally and contextually sensitive adaptation of psychometric instruments that account for the social and psychological characteristics of respondents.

Recreational and physical activity among students is closely associated with indicators of mental health and emotional well-being. Rodríguez-Romo et al. [6] showed that regular physical activity contributes to a reduction in anxiety and depressive symptoms among students, while simultaneously improving cognitive functioning and social activity. A systematic review by White et al. [7] emphasized that this effect is mediated by a range of psychological factors, including self-efficacy, leisure satisfaction, and social support. A meta-analysis by Huang et al. [8] confirmed that moderate-intensity physical activity represents the most stable factor in the prevention of depressive symptoms in the student population. Yu et al. [9] found that motivation for engaging in physical activity enhances students' self-efficacy, with leisure satisfaction and psychological resilience acting as mediators of this relationship. Practice-oriented forms of campus recreation, particularly the Fitness Buddies program described by Kirby et al. [10], demonstrated that social interaction through physical activity promotes a sense of belonging and reduces stress levels. Similarly, studies by Puhakka [11] and Newsome and Garcia [12] confirmed that students' participation in nature-based and campus recreation contributes to improved subjective well-being and helps overcome constraints related to time scarcity, high stress levels, and limited resources.

Awareness of recreational activity is considered an important component of students' psychological and social engagement in recreational practices. At the next level of analysis, researchers focus not only on the effects of physical or leisure activity, but also on its meaningfulness and value-based perception. In this context, Ekinci and Ozdilek [13] proposed the Recreational Awareness Scale (RAS), designed to assess awareness of participation in recreational activities across three aspects, including pleasure, social interaction, and self-realization. Subsequent studies have confirmed the applied relevance of this concept in diverse samples. For example, Ece et al. [14] demonstrated that higher levels of recreational awareness are associated with greater subjective satisfaction and a stronger sense of happiness among children. Similar findings were reported by Bebek and Çakmak-Yildizhan [15], who identified a relationship between recreational awareness and positive body image among women. Collectively, these studies support the universal nature of the recreational awareness construct and provide a theoretical and methodological basis for its cultural and linguistic adaptation and application in the Ukrainian context.

Recreational activity of students under war conditions acquires particular importance as a means of recovery and psychological self-support. A study by Skrypchenko et al. [16] showed that during the war in Ukraine, students experienced significant lifestyle changes, including reduced levels of physical activity and disruptions in the balance between academic workload and restorative activities. Similar findings were reported by Andrieieva et al. [17], who noted a decrease in students' motor activity under conditions of distance learning and martial law, accompanied by increased anxiety and fatigue. In the study by Byshevets et al. [18], regular physical activity was found to exert a pronounced protective effect and to be associated with lower levels of stress among students in the context of military conflict. Taken together, these data underscore the need to develop and implement recreational activity programs aimed at supporting psycho-emotional resilience and facilitating youth adaptation to prolonged stress exposure.

Analysis of previous research indicates that recreational activity plays a significant role in maintaining students' mental and physical well-being, particularly under conditions of prolonged stress and social instability. Researchers emphasize that mindful engagement in recreational practices contributes to the development of psychological resilience, self-regulation, and social interaction, thereby forming a foundation for adaptation to adverse life circumstances. At the same time, the influence of the wartime context on the perception and awareness of recreational activity remains insufficiently explored within the cultural and

educational environment of Ukraine, where students face unique stress-related and social challenges. This gap highlights the need for a comprehensive analysis aimed at identifying the specific features of recreational awareness formation, as well as for a psychometric evaluation of an instrument capable of objectively measuring this construct.

The purpose of the study was to assess the level of students' recreational awareness and to examine the psychometric characteristics of the Ukrainian version of the Recreational Awareness Scale (RAS).

## Materials and Methods

### *Participants*

The study included 89 university students from Eastern Ukraine ( $n = 53$ ) and Western Ukraine ( $n = 36$ ). The sample consisted of 49 men (55.1%) and 40 women (44.9%). Data collection was conducted between February and March 2025 under wartime conditions in Ukraine. All participants were enrolled in physical education courses as part of their academic curriculum or were studying at faculties of physical culture.

Data were collected using the online version of the Recreational Awareness Scale (RAS) questionnaire administered via the Google Forms platform. Participation in the study was entirely voluntary and anonymous. Prior to completing the survey, respondents provided informed consent to participate and agreed that the information provided would be used exclusively for scientific purposes.

### *Study Design*

The study employed a descriptive cross-sectional design and was aimed at assessing the level of students' awareness of recreational activity under war conditions, as well as at examining the psychometric properties of the Recreational Awareness Scale (RAS) in a Ukrainian sample. The analysis focused on the reliability and validity indicators of the instrument, as well as on the distributional characteristics of responses across different respondent subgroups.

### *Instruments and Procedure*

Data were collected using the Ukrainian adapted version of the Recreational Awareness Scale (RAS), developed on the basis of the original instrument proposed by Ekinci and Ozdilek [13]. The questionnaire consists of 41 items grouped into three aspects reflecting different components of recreational awareness: Pleasure/Fun, Social/Success, and Self-improvement. Each item was rated on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

The Pleasure/Fun aspect reflects the extent to which recreational activity is perceived as a source of enjoyment, relaxation, and emotional recovery.

The Social/Success aspect characterizes awareness of the social and professional significance of recreational activity, including its role in developing interpersonal relationships and fostering a sense of social success. The Self-improvement aspect describes the perception of recreational activity as a means of personal growth, self-development, and realization of internal potential. Assessment of each aspect allows the level of recreational awareness to be determined from low to high.

Data collection was conducted online using the Google Forms platform. The study was carried out under conditions of military conflict, which motivated a comparative analysis of responses from students residing in regions with different levels of safety, including Eastern and Western Ukraine. This approach made it possible to evaluate the stability and reproducibility of the psychometric characteristics of the RAS under conditions of increased socio-psychological strain.

### *Data Processing Algorithm*

The data processing algorithm consisted of sequential stages of statistical analysis aimed at verifying measurement accuracy and assessing the reliability of the obtained results.

1. *Preliminary data processing* included verification of data entry accuracy, removal of missing values and logical errors, and variable coding. Region of residence was coded as 1 = Eastern Ukraine and 2 = Western Ukraine. Gender was coded as 1 = men and 2 = women. Academic year was coded numerically from 1 to 5.
2. *Scale reliability assessment* was conducted using Cronbach's alpha coefficient and analysis of internal consistency of the aggregated scale aspects.
3. *Construct validity assessment* was performed by analyzing correlations among the RAS aspects to confirm their structural coherence.
4. *Normality testing* was conducted for all three scale aspects using the Shapiro–Wilk test, with  $p$ -values below 0.05 interpreted as evidence of deviation from a normal distribution.
5. *Comparative analysis* was performed using non-parametric statistical methods:
  - the Mann–Whitney U test for comparisons by gender and region of residence;
  - the Kruskal–Wallis H test for analyzing differences among students from different academic years;
  - the Dwass–Steel–Critchlow–Fligner post hoc test to clarify between-group differences.
6. *Descriptive statistics* included calculation of means, standard deviations, minimum and maximum values for the three RAS aspects, as well as analysis of the overall distribution structure of the indicators.

*Statistical Analysis*

Statistical data processing was performed using the Python programming language. Standard methods of descriptive and inferential statistics were applied. The level of statistical significance was set at  $p < 0.05$  for all analyses. Normality of distributions was assessed using the Shapiro–Wilk test. In cases where distributions deviated from normality, non-parametric analytical methods were applied. The Mann–Whitney U test was used to compare two independent groups. Differences among students from different academic years were analyzed using the Kruskal–Wallis H test. When a significant overall effect was identified, the Dwass–Steel–Critchlow–Fligner post hoc test was applied to clarify between-group differences.

Descriptive statistics included calculation of means, standard deviations, minimum and maximum values. Interpretation of correlation and determination coefficients followed commonly accepted threshold values. Consistency was considered high when  $r$  values were  $\geq 0.70$  or  $R^2$  values were  $\geq 0.75$ . Effect size estimation using  $\eta^2$  was interpreted according to the following criteria: values below 0.06 were considered small effects, values from 0.06 to 0.14 as medium effects, and values of 0.14 or higher as large effects. All statistical tests were conducted in a two-tailed format.

**Results**

To examine the internal structural coherence of the aggregated scoring procedure, an auxiliary linear regression analysis was conducted in which the total RAS score was regressed on its three subscale scores (Pleasure/Fun, Social/Success, and Self-improvement). The regression model was statistically significant ( $F(3,85) = 678, p < 0.001$ ) and yielded a coefficient of determination of  $R^2 = 0.960$ ,

which reflects the additive structure of the total score calculation (Table 1). This analysis was not intended as a test of reliability or construct validity, but rather as a numerical verification of internal aggregation consistency.

**Table 1.** Model fit indices of the RAS linear regression model

| Indicator      | Value   |
|----------------|---------|
| $R^2$          | 0.960   |
| Adjusted $R^2$ | 0.959   |
| F              | 678     |
| df1            | 3       |
| df2            | 85      |
| p              | < 0.001 |
| N              | 89      |

Note. The linear regression model is statistically significant ( $p < 0.001$ ).

Because the total score of the RAS is calculated as the sum of its three subscale scores, the high coefficient of determination ( $R^2 = 0.960$ ) reflects the mathematical structure of the scale rather than an independent validation test. Therefore, this regression model should be interpreted as a procedural consistency check rather than evidence of predictive or structural validity.

All three aggregated aspects made statistically significant positive contributions to the total RAS score (Table 2).

Given the additive computation of the total score, the regression analysis serves as a numerical consistency check rather than as an independent validation procedure.

At the second stage, a correlation analysis was performed between the aggregated aspects of the RAS using Pearson’s correlation coefficient. The results are presented in Table 3.

**Table 2.** Coefficients of the RAS linear regression model

| Predictor (Aspect) | b      | SE    | t     | p       | $\beta$ (standardized) | 95% CI      |
|--------------------|--------|-------|-------|---------|------------------------|-------------|
| Constant           | -8.109 | 4.834 | -1.68 | 0.097   | —                      | —           |
| Pleasure/Fun       | 1.021  | 0.215 | 4.76  | < 0.001 | 0.199                  | 0.116–0.282 |
| Social/Success     | 1.127  | 0.175 | 6.44  | < 0.001 | 0.504                  | 0.348–0.659 |
| Self-improvement   | 0.943  | 0.216 | 4.36  | < 0.001 | 0.311                  | 0.169–0.452 |

Note. All three aspects were statistically associated with the total RAS score ( $p < 0.001$ ). The standardized coefficients reflect proportional contributions within the additive scoring structure of the total RAS score. Because the total score is calculated as the sum of its subscale components, these coefficients should not be interpreted as indicators of differential predictive strength or substantive dominance of any particular dimension.

**Table 3.** Correlation coefficients between the RAS aspects

| Aspect pairs                        | r coefficient | p value | Interpretation                       |
|-------------------------------------|---------------|---------|--------------------------------------|
| Pleasure/Fun and Social/Success     | 0.849         | < 0.001 | Very high positive relationship      |
| Pleasure/Fun and Self-improvement   | 0.823         | < 0.001 | Very high positive relationship      |
| Social/Success and Self-improvement | 0.952         | < 0.001 | Nearly perfect positive relationship |

Note. All correlations are statistically significant ( $p < 0.001, N = 89$ ). Confidence intervals for the correlation coefficients ranged from 0.75 to 1.00, indicating high stability of the estimates.

High and statistically significant positive correlations were identified among the three RAS aspects ( $r$  values from 0.82 to 0.95,  $p < 0.001$ ). These results indicate strong interrelatedness of the aggregated indicators. However, high intercorrelations (up to  $r = 0.952$ ) suggest substantial overlap between subscales and require cautious interpretation regarding discriminant distinctiveness.

To assess the construct validity of the scale, a confirmatory factor analysis (CFA) was conducted. The model included three aggregated aspects, Pleasure/Fun, Social/Success, and Self-improvement. Model fit indices are presented in Table 4.

**Table 4.** Model fit indices

| Indicator      | Value                |
|----------------|----------------------|
| CFI            | 1.000                |
| TLI            | 1.000                |
| SRMR           | 0.000000015          |
| RMSEA (90% CI) | 0.000 (0.00 to 0.00) |

The obtained model fit indices (CFI = 1.00, TLI = 1.00, RMSEA = 0.00, SRMR < 0.01) reflect a complete fit of the aggregated three-indicator model to the empirical data. Given that the CFA was conducted at the level of subscale scores, these indices should be interpreted as evidence of higher-order structural coherence rather than full construct validation. Standardized factor loadings of the aggregated aspects are presented in Table 5.

**Table 5.** Standardized factor loadings of the RAS CFA model

| Aspect           | Standardized factor loading | p value |
|------------------|-----------------------------|---------|
| Pleasure/Fun     | 0.856                       | < 0.001 |
| Social/Success   | 0.991                       | < 0.001 |
| Self-improvement | 0.961                       | < 0.001 |

All aggregated aspects of the scale demonstrated high and statistically significant standardized factor loadings, ranging from 0.86 to 0.99, with  $p < 0.001$ . These results indicate a strong association with the general latent factor, awareness of recreational activity. The CFA findings support the structural consistency of the aggregated dimensions of the RAS within the present sample.

Taken together, the results of the correlation analysis and aggregated-level confirmatory factor analysis provide preliminary evidence of internal coherence among the three dimensions of the RAS. However, given that the regression model reflects the additive structure of the total score and that CFA was conducted on aggregated subscale scores, these findings should be interpreted as exploratory and do not constitute full item-level validation of the instrument.

Table 6 presents descriptive statistical indicators for the three aspects of the Recreational Awareness Scale (RAS), Pleasure/Fun, Social/Success, and Self-improvement. The mean values and standard deviations reflect the distribution of recreational awareness indicators in the examined sample of students.

**Table 6.** Descriptive statistics of the RAS aspects

| RAS aspect       | M ± SD      | Minimum | Maximum |
|------------------|-------------|---------|---------|
| Pleasure/Fun     | 41.6 ± 6.64 | 20      | 50      |
| Social/Success   | 70.4 ± 14.9 | 30      | 90      |
| Self-improvement | 50.6 ± 11.0 | 22      | 65      |

The obtained data indicate moderate variability across all scale aspects, with coefficients of variation ranging from 15 to 21 percent, which suggests relative stability of respondents' answers. The minimum and maximum values reflect the presence of individual differences, which were most pronounced for the Social/Success aspect. Overall, the distribution of indicators is consistent across all three components of the RAS.

For the three aspects of the Recreational Awareness Scale (RAS), Pleasure/Fun, Social/Success, and Self-improvement, normality of the distributions was assessed using the Shapiro Wilk test. The test results revealed statistically significant deviations from normal distribution for all scale aspects ( $p < 0.001$ ). The  $W$  value was 0.937 for the Pleasure/Fun aspect, 0.941 for Social/Success, and 0.937 for Self-improvement. These findings indicate that the distributions do not meet the normality criterion, which justifies the use of nonparametric methods in the subsequent comparative analysis of group differences, particularly the Mann Whitney U test.

To assess differences between students from Eastern Ukraine ( $n = 53$ ) and Western Ukraine ( $n = 36$ ), the nonparametric Mann Whitney U test was applied for the three aspects of the Recreational Awareness Scale (RAS), Pleasure/Fun, Social/Success, and Self-improvement. The results of the analysis revealed no statistically significant differences between the groups for any of the scale aspects ( $p > 0.05$ ). Mean values for all components were comparable between students from Eastern and Western Ukraine (Table 7). The observed differences for the Self-improvement aspect were minor and did not reach statistical significance.

To assess gender differences in levels of recreational awareness, the nonparametric Mann Whitney U test was applied to the three aspects of the Recreational Awareness Scale (RAS), Pleasure/Fun, Social/Success, and Self-improvement. The analysis revealed no statistically significant differences between men and women for any of the scale aspects ( $p > 0.05$ ). Although mean values were slightly higher for women across all components,

these differences were minor and did not reach statistical significance (Table 8). This indicates a similar level of recreational awareness among men and women within the analyzed sample.

To assess regional differences in levels of recreational awareness, separate comparisons were conducted between students from Eastern and Western Ukraine within male and female subgroups. The analysis was performed for the three aspects of the Recreational Awareness Scale (RAS), Pleasure/Fun, Social/Success, and Self-improvement, using the nonparametric Mann Whitney U test. The results revealed no statistically significant regional differences for any of the scale aspects among either men or women ( $p > 0.05$  in all cases). Mean values for all scale components were comparable between regions within each gender subgroup (Table 9). The observed differences for the Self-improvement aspect were minor and did not reach statistical significance.

To assess differences in levels of recreational awareness among students from different academic years, a nonparametric one way analysis of variance using the Kruskal Wallis criterion was applied. The analysis was conducted for the three aspects of the Recreational Awareness Scale (RAS), Pleasure/Fun, Social/Success, and Self-improvement. The Kruskal

Wallis test results revealed no statistically significant differences among students from different academic years for any of the scale aspects ( $p > 0.05$ ; Table 10). Additional pairwise comparisons using the Dwass Steel Critchlow Fligner (DSCF) test also showed no significant differences between individual academic years. The obtained data indicate relative stability of recreational awareness indicators throughout the period of university study.

**Table 10.** Kruskal Wallis test results by academic year

| RAS aspect       | $\chi^2$ | df | p     | $\eta^2$ |
|------------------|----------|----|-------|----------|
| Pleasure/Fun     | 3.85     | 3  | 0.279 | 0.0437   |
| Social/Success   | 2.75     | 3  | 0.431 | 0.0313   |
| Self-improvement | 4.39     | 3  | 0.222 | 0.0499   |

## Discussion

The purpose of this study was to assess the level of students' recreational awareness and to examine the psychometric characteristics of the Ukrainian version of the Recreational Awareness Scale (RAS). The obtained results indicate substantial interrelatedness of the three scale aspects (Pleasure/Fun, Social/Success, and Self-improvement) and support the structural coherence of the aggregated

**Table 7.** Between group differences in the RAS aspects (Mann Whitney U test)

| RAS aspect       | U   | p     | Effect size (r) | Eastern Ukraine M ± SD | Western Ukraine M ± SD |
|------------------|-----|-------|-----------------|------------------------|------------------------|
| Pleasure/Fun     | 935 | 0.877 | 0.02            | 41.5 ± 6.51            | 41.6 ± 6.92            |
| Social/Success   | 953 | 0.997 | 0.00            | 70.3 ± 15.27           | 70.7 ± 14.56           |
| Self-improvement | 856 | 0.413 | 0.10            | 49.9 ± 11.61           | 51.6 ± 10.25           |

**Table 8.** Gender differences in the RAS aspects (Mann Whitney U test)

| RAS aspect       | U   | p     | r     | Women M ± SD | Men M ± SD   |
|------------------|-----|-------|-------|--------------|--------------|
| Pleasure/Fun     | 954 | 0.829 | -0.03 | 42.0 ± 6.19  | 41.2 ± 7.03  |
| Social/Success   | 921 | 0.626 | -0.06 | 71.8 ± 14.37 | 69.3 ± 15.38 |
| Self-improvement | 869 | 0.358 | -0.11 | 51.9 ± 10.82 | 49.6 ± 11.24 |

**Table 9.** Regional differences in the RAS aspects among men and women (Mann Whitney U test)

| Group | RAS aspect       | U   | p     | r     | Eastern Ukraine M ± SD | Western Ukraine M ± SD | Conclusion                  |
|-------|------------------|-----|-------|-------|------------------------|------------------------|-----------------------------|
| Men   | Pleasure/Fun     | 278 | 0.752 | 0.05  | 41.3 ± 6.29            | 41.2 ± 8.08            | Differences not significant |
| Men   | Social/Success   | 284 | 0.847 | -0.03 | 69.6 ± 14.60           | 69.0 ± 16.73           | Differences not significant |
| Men   | Self-improvement | 275 | 0.707 | 0.06  | 49.4 ± 10.85           | 49.8 ± 12.01           | Differences not significant |
| Women | Pleasure/Fun     | 187 | 1.000 | -0.00 | 41.8 ± 6.87            | 42.2 ± 5.07            | Differences not significant |
| Women | Social/Success   | 185 | 0.955 | 0.01  | 71.0 ± 16.25           | 73.1 ± 10.92           | Differences not significant |
| Women | Self-improvement | 163 | 0.501 | 0.13  | 50.5 ± 12.60           | 54.1 ± 6.75            | Differences not significant |

three-factor model within the present sample. The results of the confirmatory factor analysis provide preliminary support for the structural coherence of the aggregated RAS dimensions. However, given that the CFA was conducted at the level of subscale scores rather than individual items, these findings should be interpreted as exploratory and do not constitute full item-level validation of the instrument. The absence of statistically significant differences by region and gender suggests a similar perception of recreational activity among students regardless of socio geographic factors and sex. Taken together, these findings provide a basis for further analysis of the relationships between recreational awareness, psycho emotional state, and social functioning of students under conditions of increased stress and uncertainty associated with wartime events.

The regression model presented in the Results section was used exclusively as an internal aggregation check. Because the total RAS score is calculated as the sum of its subscale components, the high explained variance reflects the mathematical structure of the scoring procedure rather than an independent validation test. Therefore, conclusions regarding structural validity are primarily based on correlation analysis and aggregated-level confirmatory factor modeling.

#### *Psychometric stability and cross cultural reproducibility of the RAS*

Comparison of the obtained results with data from the original study by Ekinçi and Ozdilek [13] confirms the stability of the three factor structure of the Recreational Awareness Scale (RAS), which includes the Pleasure/Fun, Social/Success, and Self-improvement aspects. The Ukrainian version of the scale demonstrated high internal consistency and structural validity, indicating preservation of the conceptual integrity of the instrument during the process of cultural and linguistic adaptation. The psychometric characteristics obtained in the present study are generally comparable with those reported for the original version of the scale, for which high measurement reliability was also demonstrated.

Similar findings have been reported in subsequent studies conducted in different sociocultural contexts. In the studies by Ece et al. [14] and Bebek and Çakmak-Yildizhan [15], the three component model of the RAS also demonstrated structural stability and high subscale consistency, supporting the universal nature of the measured construct. Consistency of overall psychometric characteristics and ranges of factor loadings across samples from different countries allows the RAS to be considered an instrument that reflects core psychological aspects of mindful participation in recreational activity.

Contemporary research in the field of recreation and psychological well-being further supports

the stability of a multidimensional approach to measuring leisure activity. For example, the development of the Leisure Activity Scale for Young Adults demonstrated high reliability and internal consistency of indicators of recreational participation [19], which is consistent with the factor modeling logic applied in the RAS. Similarly, Köse et al. [20] demonstrated gender invariance of the Perceived Health Outcomes of Recreation Scale (PHORS), highlighting the universal nature of perceptions of recreational effects. In the study by Sarol et al. [21], perceived recreational outcomes and subjective happiness were shown to be mediated by psychological resilience, which strengthens the theoretical rationale for the relationship between mindful recreational activity and personal well-being. Complementing this body of research, Munusturlar and Bayrak [22] proposed the Leisure Education Scale, within which awareness of recreational activity is considered a significant component of educational and personal development.

Taken together, the presented evidence is consistent with the results of the present study and confirms that recreational awareness can be reliably measured across diverse cultural and social contexts. This allows the adapted Ukrainian version of the RAS to be considered a preliminarily supported instrument for use in Ukrainian student samples, while cross-cultural validation requires further large-scale and multi-sample investigation.

#### *Recreational awareness as a factor of students' psychological resilience*

Analysis of contemporary research indicates that mindful participation in recreational activities performs an important adaptive function and is associated with increased psychological resilience and subjective well-being among students. Sarol et al. [21] reported that perceived recreational outcomes and levels of subjective happiness are mediated by psychological resilience. In turn, Kirby et al. [10] demonstrated that campus based peer support programs grounded in recreational activity contribute to enhanced well-being and greater social engagement among students.

These conclusions are consistent with findings from studies conducted under crisis conditions and in contexts of armed conflict. Efrat Treister and Fuchs [23] highlighted the restorative potential of leisure activity during wartime, while Kokun and Bezverkhyi [24] showed that the combination of personal resources and mindful activity contributes to Ukrainian students' resistance to war related stress. These data emphasize the importance of recreational awareness as a mechanism of psychological adaptation under extreme conditions.

Additional empirical evidence supports the role of mindful recreation and interaction with natural

environments as resources for emotional stability and psychosocial adaptation. Studies by Giordano et al. [25], Wullenkord et al. [26], and de Jonge et al. [27] demonstrate that recreational activity oriented toward mindful experience and recovery contributes to the reduction of emotional tension and the maintenance of psychological balance during periods of crisis.

The results of a systematic review by Korobeinikova et al. [28] further confirm that students' participation in recreational and rehabilitative activities is associated with lower stress levels and enhanced subjective well-being. Taken together, findings from previous research are consistent with the results of the present study and support the role of recreational awareness as a significant factor of psychological resilience and student adaptation under war conditions.

#### *Regional and Gender Related Characteristics of Recreational Activity Perception*

Studies addressing recreational awareness emphasize the universality of its structure and its relevance for different social groups. In the study by Ekinci and Ozdilek [13], perception of recreation was shown to include three interrelated components, pleasure, social success, and self-realization. Subsequently, Ece et al. [14] confirmed that the level of recreational awareness is positively associated with subjective happiness, while Bebek and Çakmak Yıldızhan [15] identified its relationship with body acceptance and emotional comfort. A number of studies have also shown that perceived recreational outcomes are generally independent of gender and sociocultural differences, with psychological resilience acting as a key mediator between leisure awareness and well-being [20; 21]. These findings provide a theoretical basis for examining the potential role of regional and gender factors in the perception and implementation of recreational activity in the Ukrainian student context.

At the same time, some studies indicate the presence of certain differences in the level and nature of students' recreational activity depending on gender and region of residence. Bergier et al. [29] reported that among Ukrainian students, men demonstrate higher levels of physical and recreational activity than women, while overall engagement in health oriented practices remains moderate. In an earlier study, Bergier et al. [30] noted that patterns of recreational activity are shaped by social, cultural, and educational factors, and that regional differences reflect variations in infrastructure and local leisure traditions. The findings of Vypasniak et al. [31] showed that even under war conditions, students from Eastern and Western Ukraine demonstrate similar evaluations of the educational and recreational environment, although higher satisfaction with conditions and

recovery opportunities is observed in western regions. Taken together, these data suggest that gender and regional characteristics of recreational activity perception are not radical in nature, but may manifest as differences in intensity, motivation, and subjective evaluation of recreational experience.

#### *Practical Implications and prospects for the use of the RAS in the ukrainian context*

The practical value of the Recreational Awareness Scale (RAS) lies in its potential for systematic monitoring of students' recreational awareness and for analyzing patterns of engagement in leisure practices within educational settings. In the original study by Ekinci and Ozdilek [13], the scale demonstrated high reliability and theoretical coherence, which enabled its subsequent use in studies assessing life satisfaction and subjective happiness [14], as well as body acceptance and emotional comfort [15]. These findings confirm the universality of the scale's conceptual model and its applicability across different research contexts.

Methodological recommendations for cultural and linguistic adaptation of psychometric instruments [32], together with the successful validation of the Ukrainian version of the CTSR scale under war conditions [5], support the feasibility of appropriately adapting the RAS for a Ukrainian sample. Under conditions of armed conflict, studies by Ukrainian researchers indicate that physical activity and recreational practices function as significant factors of students' psychological resilience and recovery [16, 18]. In this context, the adapted Ukrainian version of the RAS may be used not only for scientific analysis, but also as a practical tool for evaluating the effectiveness of recreational support programs and for conducting cross cultural comparisons in the fields of education and health.

Practical implementation of the concept of mindful recreation requires the training of specialists capable of organizing restorative and supportive forms of activity within educational environments. Makotchenko [33] emphasizes that under wartime conditions, pedagogical mechanisms aimed at fostering psychological resilience and providing psycho emotional support to students through recreational programs become particularly important. Within this framework, the adapted RAS can be integrated into educational and psycho pedagogical interventions as a diagnostic tool and as a means of evaluating the effectiveness of implemented measures.

Findings from both international and domestic research further highlight the importance of developing psychological resources through recreational practices. Svatenkova [34] demonstrated that engaging adolescents and students in programs aimed at activating personal potential contributes to the formation of sustainable behavioral

strategies and enhances self-regulation. This allows recreational awareness to be considered not only as an indicator of emotional well-being, but also as a tool for developing psychological resilience within educational settings.

Summarizing the results of the conducted analysis, recreational awareness can be regarded not only as an individual characteristic, but also as an indicator of the adaptive potential of the student population. The Ukrainian version of the Recreational Awareness Scale (RAS) demonstrated reliability in assessing various aspects of participation in recreational activity and made it possible to identify relationships between mindful recreation, emotional resilience, and social interaction. Under conditions of wartime stress, these relationships acquire particular importance, reflecting students' efforts to maintain psychological balance through engagement in restorative forms of activity. Overall, the discussed findings provide a foundation for the practical application of the RAS and define directions for future research focused on analyzing the role of mindful recreation in the processes of psychological adaptation of students in Ukraine.

#### *Study limitations and directions for future research*

Despite the confirmed reliability and construct validity of the Ukrainian version of the Recreational Awareness Scale (RAS), the present study has several limitations. First, the sample consisted primarily of university students, which limits the generalizability of the findings to other age and social groups. Second, data collection was conducted under wartime conditions, which may have influenced respondents' psychoemotional state and their subjective perception of recreational activity. Third, the use of self-report measures entails a potential risk of response bias due to social desirability effects.

In addition, the study design did not include a longitudinal component, which prevents assessment of changes in recreational awareness over time. Future research directions include expanding the sample to encompass participants from different regions of Ukraine and diverse social

groups, incorporating international comparisons, and applying the RAS in comprehensive studies aimed at examining the role of recreational activity in the development of psychological resilience and social adaptation among young people.

## **Conclusions**

The conducted study confirmed the psychometric adequacy of the Ukrainian version of the Recreational Awareness Scale (RAS) and its applicability for analyzing recreational awareness among students living under wartime conditions. The three factor structure of the scale, including the Pleasure/Fun, Social/Success, and Self-improvement aspects, demonstrated high internal consistency, indicating preservation of the original conceptual model of the instrument during the process of cultural and linguistic adaptation.

The present study did not directly assess psychoemotional state or subjective well-being; therefore, potential associations between recreational awareness and psychological outcomes remain theoretical and require empirical verification in future research including additional psychological measures. The Ukrainian version of the RAS can be used for assessing levels of recreational awareness in student populations, evaluating patterns of engagement in recreational practices, and supporting further research within comparable educational and cultural contexts.

## **Conflict of interest**

Authors Sergii Iermakov, Wladyslaw Jagiello, and Tetiana Yermakova are members of the editorial board of the journal. To ensure an objective and unbiased review process, the manuscript was handled by an independent member of the editorial board, and the peer review was conducted by external reviewers with no affiliations to these authors. The above-mentioned authors did not participate in the peer-review process or in any editorial decision-making related to this manuscript. The remaining authors declare that they have no conflicts of interest.

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Cite this article as:

Iermakov S, Yermakova T, Vypasniak I, Ivanyshyn I, Yatsiv Y, Cieslicka M. Validation of the Recreational Awareness Scale among ukrainian students under wartime conditions. *Physical Education of Students*, 2026;30(1):43–53. <https://doi.org/10.15561/20755279.2026.0105>

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Received: 03.01.2026

Accepted: 25.02.2026; Published: 28.02.2026