PSYCHOMETRIC PROPERTIES OF THE INVENTORY OF COLLEGE STUDENTS' RECENT LIFE EXPERIENCES (ICSRLE): LITHUANIAN VERSION

Ieva Peciuliene, PhD Candidate
Aidas Perminas, PhD
Loreta Gustainiene, PhD
Dovile Valiune PhD Candidate
Department of Theoretical psychology, Vytautas Magnus University, Kaunas, Lithuania

Abstract

Objective. Although health care professionals have been interested in the phenomenon of stress for decades, many researchers agree that this issue has not been given enough attention, especially when it comes to stress measurement methods in different cultural settings and different population groups. The aim of the study was to investigate psychometric properties of the Lithuanian version of ICSRLE and to compare these results with the original scale.

Methods. 437 students had participated in the study by filling the questionnaires voluntarily. Age of participants ranged from 18 to 32 years.

Results. Psychometric properties of the Lithuanian version of ICSRLE demonstrated statistically acceptable level of internal and external reliability of the scale and the subscales. The Lithuanian version of the scale demonstrated statistically acceptable levels of content and construct validity as well. Exploratory and confirmatory factor analyses revealed a different 6-factor structure of the scale using 36 items. The scale structure included the following dimensions: relationships problems, lack of time, social alienation, future decisions, academic dissatisfaction, financial problems. 13 items of the original scale did not correspond to the 6-factor structure.

Conclusions. The structure of 6 factors was a better fit for the Lithuanian students than the original structure of 7 factors.

Keywords: University students, stress, factor analysis, reliability, validity

Introduction

Although health care professionals have been interested in the phenomenon of stress for decades, many researchers agree that this issue has not been given enough attention as opinions of various authors on the significance of stress on individual‘s health and personal well-being differ (Rees, & Redfern, 2000, Agolla, & Ongori, 2009).

There are three main approaches related to exploring the stress phenomenon: H. Selye defines stress as a non-specific physiological response of an organism to any demand from the environment. A second approach is based on the work of T. Holmes and R. Rahe and focuses on stressors verses the response to stress. The third stress model, addresses the proportion between situational requirements and the individual's abilities to cope with them when the individual sees situational requirements as exceeding his/her coping power resources (Lazarus, & Folkman, 1984).

In spite of the different approaches to the stress phenomenon, it is acknowledged that long-term exposure to stress can adversely impact the physiological and psychological homeostasis of an organism (Alzaeem, Sulaiman, & Wasif Gillani, 2010), and contribute to psychological and physical well-being of the individual (Fink, 2010).

One of the stress research aspects focuses on the assessment of major and minor life changes and other stressors with the help of self-rated questionnaires (Dwyer, Cummings, 2001, Amponsah, 2010). It is accepted that physical and mental health is affected negatively not only by major life changes (partner's loss, illness, moving) but also by small everyday stressors and experiences (conflicts with the partner, friends, family, struggling to meet academic standards, friend's betrayal, social exclusion, etc.) (Lazarus, & Folkman, 1984, Kohn, O'Brien, & Pickering, 1997).

The main stressors affecting students in the academic environment cover many areas. These areas include high academic ambitions, vague requirements, unclear timetable structure, competition for scholarships, poor relations with lecturers and other students, financial difficulties, peer pressure, problems in romantic relations, new environment at the beginning of studies, high expectations of parents, concern about the future, etc. (Alzaeem, Sulaiman, & Wasif Gillani, 2010, Agolla, & Ongori, 2009, Wilks, 2008).

A strong and long-lasting stress, students are exposed to, can diminish learning achievements, increase consumption of harmful substances and affect a student's ability to integrate in the academic life (Abouserie, 1994). High stress level is connected with bad eating habits and lack of psychical activity, low self-esteem, suicidal tendencies, worse sleeping quality, financial difficulties (Hudd et al., 2000, Busari, 2011), lower well-

being, greater depression, overall anxiety and worrying during exams (Dwyer, & Cummings, 2001, Gadzella, Masten, & Stacks, 1998).

A lot of student stress research is carried out with the students of specific specialities, i.e. medicine, nursing, odontology or psychology. Questionnaires adapted to specific groups of subjects are also used in research, e.g. Stress In Medical School Scale (SIMS)), The Student Nurse Stress Index (SNSI), Dental Environmental Stress Survey (DESS)), Psychology Student Stress Questionnaire (PSSQ) (Alzaeem, Sulaiman, & Wasif Gillani, 2010). Sometimes when examining student groups (e.g. medicine or pharmacy students) general student stress measurement inventories are used that are not adapted to a specific speciality, e.g. Student-Life Stress Inventory (SLSI), Derogatis Stress Profile (DSP), Perceived Stress Scale and etc. (Gadzella, 1994, Alzaeem, Sulaiman, & Wasif Gillani, 2010, Cohen, Kamarck, & Mermelstein, 1983). Employment of such inventories enables the researchers to compare the stress in students of different specialities. One of such inventories is The Inventory of College Students‘ Recent Life Experiences (ICSRLE). The Lithuanian version of the *Inventory of College students' Recent Life Experience* used in the present study was adapted to general university student population with no focus on their speciality. This inventory, though covering a lot of statements, is simple - it does not require complex calculations and the data is easy to process.

The Inventory of College Students‘ Recent Life Experience (ICSRLE) was developed in 1990 with a Canadian student population (Kohn, Lafreniere, & Gurevich, 1990). The scale included 49 items, to which respondents rate their extent of experience with hassles over the past month, using the following 4-point scale: 1 = *not at all part of my life*, 2 = *only slightly part of my life*, 3 = *distinctly part of my life*, or 4 = *very much part of my life*. Osman et al. conducted a validation study of this scale in 1994 (Osman et al., 1994). Possible scores ranged from 49 to 196 and were calculated by summing up the 49 item ratings. Higher ICSRLE scores represent more stress. They found that the *Inventory of College Students‘ Recent Life Experience* and the factorial structure were valid for using it to United States undergraduate college students. Internal consistency for the scale is .89 (.88 for males, and .89 for females).

In a validation study by the authors (Kohn, Lafreniere, & Gurevich, 1990) a seven factor structure was indentified. 37 items were included in seven factor structure, 12 items did not contribute to the factors structure. Thus, the results of the research by Kohn et al. (1990) and Osman et al. (1994) showed that 49-item scale could be used to evaluate a single construct, which authors called “hassles”. Factor analysis of the Inventory yielded seven interpretable factors using 37 items. The 7 subscales were labelled: development challenge, time pressure, academic alienation,

romantic problems, assorted annoyances, general social mistreatment, and friendship problems. Osman and co-workers conducted a confirmatory factor analysis that supported the 7 factor structure. Slight differences were observed in the results between studies by Kohn et al. (1990) and Osman et al. (1994) which might have been influenced by different statistical measures or cultural influences (Kohn, Lafreniere, & Gurevich, 1990, Osman et al., 1994).

In a study of Kohn and co-workers internal consistency for the scale was .89 (.88 for males, and .89 for females). For 6 subscales Cronbach's alpha ranged from .68 to .80 and for one subscale, labelled assorted annoyances, it was .47 (Kohn, Lafreniere, & Gurevich, 1990). Other studies have also demonstrated high reliability and validity of this scale - internal consistency of the scale in various studies ranged from .85 to .93 (Pritchard, Wilson, Yamnitz, 2007).

Criterion validity analysis of *The Inventory of College Students' Recent Life Experience (*ICSRLE) has often been used with the Perceived Stress Scale (PSS) (Cohen, Kamarck, Mermelstein, 1983). ICSRLE has shown to be statistically significantly correlated with the PSS (Kohn, Lafreniere, & Gurevich, 1990). 49 items correlated with the PSS ranging individually from .17 ($p < .05$) to .48 ($p < .005$) (Kohn, Lafreniere, & Gurevich, 1990, Amponsah, 2010, Pritchard, Wilson, & Yamnitz, 2007).

Since its creation ICSRLE has been extensively employed in various studies (Fenzel, 2005, Kohn, Lafreniere, & Gurevich, 1990, Kohn, O'Brien, & Pickering, 1997, Swickert et al.,2002, Volkmann, & Weekes, 2006). Some authors use 49 items and carry out factor analysis (Bodenhorn, Miyazaki, & Ng, 2009, Dwyer, Cummings, 2001). Others use 37 items with seven factors (Bodenhorn, Miyazaki, & Ng, 2009, Hussong 2003, Kohn, Lafreniere, & Gurevich, 1990). There are authors who have used both the summative inventory assessment (49 items) and 7 subscales (D'Angelo, Wierzbicki, 2003).

In their research D'Angelo and Wierzbicki (2003) used total summative inventory estimator and subscales in order to determine connections among everyday stressors students are exposed to, high level of anxiety and depression. Lai (1995) used only summative inventory estimator as the performed factor analysis did not confirm the structure of the 7 factors (Lai, 1995). When analysing relationships between student adaptation and everyday stressors they experience Jordyn and Byrd (2003) used only the subscales of the inventory. Hussong (2003) used this inventory when analysing the relations among everyday stressors that student's experience, stress coping strategies and alcohol consumption. Factor analysis distinguished 4 factors: life management, social relationships, school and general social adjustment. Amponsah (2010), when looking into the

connections between student everyday life stressors and stress coping strategies at Manchester University, distinguished 8 factors. Other authors employed only some of the individual items of the original questionnaire in their research or selected the stress causing events from the inventory at their own discretion to assess stress of university students (Lay, Safdar, 2003, Bodenhorn, Miyazaki, & Ng, 2009).

On the basis of the above mentioned research results, it could be stated that ICSRLE is characterised by relatively high rates of reliability and validity which demonstrates its suitability for either group or individual diagnostics. Still, when applying the inventory to other populations, it is quite often that the newly generated structure of factors is different from the one given by the authors of the Inventory (Amponsah, 2010, Bodenhorn, Miyazaki, & Ng, 2009).

When analysing the Lithuanian version of ICSRLE psychometric properties and in order to be able to decide on the integrity and diagnostic potential of the inventory, evidence is necessary that would justify content validity of the Lithuanian version. It is also necessary to present indicators of internal and external validity of the inventory.

Application of a measurement tool that is adapted to one culture may cause difficulties when working with students of other cultures (Alzaeem, Sulaiman, & Wasif Gillani, 2010), as authors having carried out factor analysis of the inventory statements get different factors (Bodenhorn, Miyazaki, & Ng, 2009, Hussong, 2003). Lithuanian version of ICSRLE would be of significance for university consultants, researchers, practitioners and other specialists interested in having a valid and reliable inventory on everyday stressors for Lithuanian population. The lack of stress measurement methods applicable Lithuania was the reason to assess psychometric properties (the inner compatibility and structural validity of the scales) of the Lithuanian version of the *Inventory of College Students' Recent Life Experience*.

Research method

Participants and procedure

A total of 437 University students have participated in the experiment by filling the questionnaires voluntarily. Age of participants ranged from 18 to 32 years. The participants were drawn through convenience sampling. Sociodemographic characteristics of participants are presented in Table 1.

Table 1 Sociodemographic characteristics of participants

Groups of participants (N)		Gender		Age		Study year			
		Women	Men	M	SD	1	2	3	4
1st group	Test (n=227)	136	91	20,08	1,53	71,0 %	20,5 %	3,8 %	4,8%
	Re-test (n=54)	20	14	20,91	1,22	2,9 %	38,2 %	58,8 %	0 %
2nd group (n=210)		124	86	21,18	2,06	45,4 %	23,3 %	23,3 %	7,9 %

The data of the sample was analysed in two groups in different data analysis phases. 227 students from Vytautas Magnus University and Kaunas university of Technology participated in the first stage of the research. 54 students of this stage after 4 months from the first survey were investigated repeatedly. The data of first group was used for completing exploratory factor analysis and demonstrating reliability of the *Inventory of College Students' Recent Life Experiences*.

210 students participated in the second stage of the research. The respondents of this group completed *Reeder scale, Perceived stress scale, Inventory of College Students' Recent Life Experiences, Subjectively perceived health evaluation scales*. The data of these scales were used for completing confirmatory factor analysis and demonstrate validity of the *Inventory of College Students' Recent Life Experiences*.

Every participant completed the questionnaire from 20 to 30 min. The first group was surveyed in May-June and October-November of 2012, and the second group in October – December of 2012. Data was collected during the lectures with approval of the head of the department and lecturers.

Measures

The *Inventory of College Students' Recent Life Experiences* (ICSRLE) and *The Student-Life Stress Inventory* (SSI) were used to collect data on student's **academic stress level**.

The Inventory of College Students' Recent Life Experiences (Kohn, Lafreniere, & Gurevich, 1990) consists of 49 items rated on a 4-point Likert scale for the frequency of participants' experiences with hassles over the past month: 1 – not at all part of my life, 2 – only slightly part of my life, 3- distinctly part of my life, 4 – very much part of my life. The scale measures college students' stressful experiences in reference to the particular events they undergo during their college years.

The Student-life Stress Inventory (Gadzella, 1994) is a self-report inventory designed to study college students' stressors and their reactions to these stressors on and off campus. The Inventory contains 51 items, arranged into nine categories under two sections: stressors and reactions to stressors.

The Stressors section has five categories: Frustration, Conflicts, Pressures, Changes and Self-imposed stressors. The Reactions to stressors section has four categories: Physiological, Emotional, Behavioural and Cognitive Appraisal. Each of the 51 item was ranked using the 5-point Likert scale *(1) Never, (2) Seldom (3) Occasionally, (4) Often (5) Most of the time*). The scale is based on a theoretical model described by Morris (1990). Some findings reported the reliability of Cronbach's alpha of the whole inventory and the subscales from .65 to .96 (Gadzella, & Baloglu, 2001). In the present study reliability of the whole inventory and the subscales ranged from .66 to .93.

The Reeder scale and Perceived stress scale (PSS-10) were used to measure students subjectively perceived stress level.

Psychosocial stress was investigated with a 7-item *Reeder scale* (Reeder et al., 1984), adapted by A. Goštautas et al., 1977 in Lithuania. The items were rated on a 4-point Likert scale: (1) Exactly (2) To some extent (3) Not very accurately (4) Not at all (Glasunov et al., 1981). Possible scores could range from 7 to 28 and were calculated by summing up the ratings of 7 items. Higher score of the scale indicates lover subjectively experienced stress level.

Perceived stress scale (PSS) (Cohen, Kamarck, & Mermelstein, 1983) is the most widely used psychological instrument for measuring perception of stress. It is a measure of the degree to which situations in one's life are appraised as stressful. The scale also includes a number of direct queries about current levels of experienced stress. The questions in the PSS ask about feelings and thoughts during the last month. In each case, respondents are asked to indicate how often they felt or thought a certain way using a 5-point Likert scale: *(0) Never, (1) Almost never (2) Sometimes, (3) Fairly often (5) Very often.* We followed a standardized process for cross-cultural adaptation to develop and assess the Lithuanian version. First, I. Pečiulienė and an independent professional translator completed the forward translation of the scales and then met to achieve a consensus version. This consolidated version was then backward translated by professional translator and psychologist into English and cross-verified with the original version.

The *General sleep disturbance scale* (GSDS) and *Multidimensional Fatigue Inventory* (MFI)) were used to evaluate student's sleep quality and fatigue level.

General sleep disturbance scale (Lee, 1992) was initially designed to evaluate the incidence and nature of sleep difficulties within the previous week. The scale contains 21 items, including a variety of general sleep issues: waking up during sleep, problems initiating sleep, waking too early from sleep, quality of sleep, fatigue and alertness at work, quantity of sleep

and the use of substances to induce sleep. Responses were ranked using 8-point Likert scale ranging from 0 (Never) to 7 (Every day).

Multidimensional Fatigue Inventory (Smets, 1995) is a 20-item self-report instrument designed to measure fatigue of healthy participants also including patients. The scale evaluates general fatigue, physical fatigue, reduced motivation, reduced activity and mental fatigue. Respondents used the 5-point Likert scale ranging from 1 (Yes, that is true) to 5 (No, that is not true).

Internal consistency (Cronbach's alpha coefficients), means, standard deviations and medians of the scales used in the present research are presented in Table 2.

Table 2 Data on the scales used in the present study (internal consistency and descriptive statistics)

Scales	M	SD	Md	Cronbach's alpha
ICSRLE	82.93	21,49	79.00	.94
SSI	113.64	26.20	97.00	.93
RS	17.47	4.09	18.00	.78
PSS	17.07	6.49	12.00	.87
GSDS	42.30	13.71	39.00	.66
MFI	52.58	13.93	54.00	.88

Note. ICSRLE - Inventory of College Students' Recent Life Experiences; SSI - Student-Life Stress Inventory; RS - Reeder scale; PSS - Perceived stress scale; GSDS - General sleep disturbance scale; MFI - Multidimensional Fatigue Inventory

Results

Reliability of measure

In order to assess internal validity of the Lithuanian version of the *Inventory of College Students' Recent Life Experiences* (ICSRLE) Cronbach's alpha coefficients were calculated. The results showed high internal consistency with Cronbach's alphas ranging from .92 for male students to .94 for female students, and .94 for the total Inventory. Cronbach's alpha of the original Inventory was .88, .89, and .89, respectfully (Kohn, Lafreniere, & Gurevich, 1990). Internal consistency for all the subscales was also sufficient (table 3). Large inter-item correlation coefficients showed good inter-item consistency regarding the measured phenomenon. Correlation between separate items and total score of the Inventory were statistically significant (r = .667 – .823; p < .01). Thus, internal consistency analysis showed that the Inventory was integral, items were interrelated and measured the same phenomenon.

Table 3 *The subscales of the ICSRLE (Kohn et al., 1990) (N=437)*

Subscales	M	SD	Md	α^1	α^2
1	18.61	5.26	19.00	.79	.79
2	12.69	3.97	12.00	.85	.80
3	4.93	2.07	4.00	.72	.79

4	4.78	2.00	4.00	.65	.73
5	7.60	2.82	6.00	.71	.47
6	9.55	3.63	8.00	.79	.76
7	4.69	2.19	4.00	.77	.68
ICSRLE	82.93	21.49	79.00	.94	.89

Note. 1 - Developmental challenge; 2 - Time pressure; 3 - Academic alienation; 4 - Romantic problems; 5 - Assorted annoyances; 6 - General social mistreatment; 7 - Friendship problems; α^1 - Cronbach's alpha of the present study, α^2 - Cronbach's alpha (Kohn, Lafreniere, Gurevich, 1990).

External validity of the Lithuanian version of ICSRLE was tested by test-retest method. Retest was performed by 54 students 3-4 months after the test. Results of test and re-test were compared using Student's t criterion and Pearson correlation coefficient (table 4). Students' t criterion did not reveal statistically significant differences between test and re-test scores (t = .836; p > .05) and correlation coefficient was rather large (r = .825; p < .001). Stability of repeated measurements let us to conclude, that external validity of the scale was sufficient.

Table 4. *External validity of the scale (ICSRLE) (N=54)*

Measurements	Mean (SD)	t criterion (p)	Pearson's r (p)
1st	82.93 (21.49)	.836 (p>0,05)	.825 (p<.001)
2nd	84.05 (22.13)		

Validity of measure

A confirmatory and exploratory factorial analyses was performed to assess the content validity of the inventory under investigation.

Confirmatory factorial analysis

Data of 210 students (second phase of the study) were utilised in performing confirmatory factorial analysis. Confirmatory analysis underwent two stages. First, confirmatory analysis verifying one-factor model fitness using 49 items was performed followed by a seven factor model with the 37 items suggested by Kohn et al. (1990) and Osman et al. (1994). Confirmatory factor analysis was completed using AMOS 16.

According to Hu and Bentler recommendations it was used the following five quantities and their rules for decision making about model fit: Chi-square test, the Comparative Fit Index (*CFI*, value .95 or greater), Tucker-Lewis Index (*TLI*, also known as Bentler-Bonett Non-normed Fit Index (*NNFI*), value .95 or greater), Bentler-Bonett Normed Fit Index (*NFI*), value .95 or greater), the root mean squared approximation of error (*RMSEA*, value .06 or lower) (Hu, & Bentler, 1992).

One-factor model fit using 49 items. In this research the Inventory of College Students' Recent life Experiences Cronbach's alpha coefficient

value - .94. All of the factor loadings for the structure of one-factor were statistically significant (significance level .05) and for 44 out of 49, the value of the factor loadings for the structure of one-factor were above .30 (McDonald, 1999, cited., Bodenhorn et al., 2007). Five items (1, 40, 41, 48, and 49) factor loadings were below .30. According to the AMOS 16 user's manual, the values for the one-factor structure model fit with the 49 items partly support one-factor model: $\chi^2 = 2806{,}519$, $df = 819$ ($p < .001$), *CFI* = .702, *NFI* = .772, RMSEA = .094, *TLI* = .703. χ^2 statistical significance depended upon sample size, therefore, it should be taken into account very cautiously, and *RMSEA* exceeds the values proposed by Hu and Bentler (1999), but did not exceed .1, when the model was regarded as not data fit.

7 factor model fit using 37 items. In this research Cronbach's alpha coefficients of the subscales were displayed in Table 3.

The second phase of confirmatory factor analysis was to examine whether Kohn et al., (1990) and Osman et al. (1994) seven factor model structure using 37 items was consistent with the results from the sample population. According to the AMOS 16 user's manual, the values for the seven-factor structure model fit was partly confirmed: $\chi^2 = 1627.407$, $df = 608$ ($p < .001$), *CFI* = .716, *NFI* = .621, *RMSEA* = .086, *TLI* = .672. All values for model fit were a bit lower than recommended. Therefore, it was true to say that the model that fit North American undergraduate college students did not fit the Lithuanian student's population.

Exploratory factor analysis

As the original factor structure of the scale did not correspond to the Lithuanian University students' population, exploratory factorial analysis was performed in order to assess content validity of the scale and factor structure which could be more representative of the Lithuanian students. A principal component extraction with *Promax* rotation was performed to identify the factors and their items loading. Six factors with eigenvalues of one were identified. These six factors explained 47.44 % of the variance. It is desirable for the factors to explain more than 50 % of variable dispersion (approximately 60 %), thus 47.44 % in our study did not reach the desirable criteria, nevertheless such relatively weak factors were common in psychology studies (Costello, Osborne, 2005). The six-factor structure of the scale was confirmed by a scree plot, suggested by Cattel (Cattel, 1966) as a graphic method used for determining the number of factors. The data availability for factor analysis was shown by The Kaiser-Meyer-Olkin Measure of sampling adequacy (*KMO* = .853) and Bartlett's Test f Sphericity, ($p < .001$). Not all commonalities of the scale items had values higher than 2.0. Items 1 and 41 were weakly related to the new factors so they were eliminated from future analysis.

In order to verify the appropriateness of the new six factor structure for the Lithuanian student sample a confirmatory factor analysis was performed using AMOS 16. The results showed that the model was not an ideal fit statistical recommendations ($\chi^2 = 1228.726$, $df = 541$ ($p < .001$), GFI = .769, *CFI* = .802, *NFI* = .697, *RMSEA* = .075, *TLI* = .782), nevertheless, the data allow us to state, that the new six factor structure was more appropriate for Lithuanian students sample. Table 5 presents factor structure suggested for Lithuanian students.

Table 5. *Factor structure of ICSRLE suggested for Lithuanian students*

Factors (α[1])	Items	Original factor □	Factor loading
Relationship problems (.880)	17. Decisions about intimate relationship(s)	.951	4
	39. Conflicts with boyfriend/girlfriend/spouse	.713	4
	33. Poor health of a friend	.578	
	9. Separation from people you care about	.568	
	31. Conflicts with friends	.555	7
	28. Conflicts with your family	.523	
	12. Being taken advantage of	.501	6
	6. Being taken for granted	.482	6
	8. Having your trust betrayed by a friend	.450	7
Lack of time (.876)	15. A lot of responsibilities	.797	2
	18. Not enough time to meet your obligations	.783	2
	5. Too many things to do at once	.778	2
	13. Not enough leisure time	.741	2
	30. Finding courses too demanding	.676	1
	27. Not enough time for sleep	.635	2
	29. Heavy demands from extracurricular activities	.548	2
	11. Struggling to meet your own academic standards	.364	1
Social alienation (.766)	4. Social rejections	.787	6
	42. Social isolation	.678	6
	24. Loneliness	.562	6
	44. Being ignored	.409	6
	2. Being let down or disappointed by friends	.403	7
Future decisions (.745)	20. Important decisions about your future career	.817	1
	23. Important decisions about your education	.704	1
	19. Dissatisfaction with your mathematical ability	.499	1
Academic dissatisfaction (.721)	26. Conflict with teaching assistant(s)	.899	
	34. Disliking your studies	.796	3
	16. Dissatisfaction with school	.760	3
	46. Finding course(s) uninteresting	.482	3
	3. Conflict with professor(s)/instructor(s)	.472	
	22. Dissatisfaction with your reading ability.	.409	
Finance	7. Financial conflicts with family members	.587	

problems (.662)	35. Getting "ripped off" or cheated in the purchase of services	.567	5
	21. Financial burdens	.407	
	43. Long waits to get service (e.g., at banks or stores)	.402	
	37. Difficulties with transportation	.382	
Items not related in factor structure	1. Conflicts with boyfriend's/girlfriend's/spouse's family		1
	10. Having your contributions overlooked		5
	14. Struggling to meet the academic standards of others		1
	25. Lower grades than you hoped for		1
	32. Hard effort to get ahead		1
	36. Social conflicts over smoking		5
	38. Disliking fellow student(s)		5
	40. Dissatisfaction with your ability at written expression		1
	41. Interruptions of your school work		2
	45. Dissatisfaction with your physical appearance		1
	47. Gossip concerning someone you care about		5
	48. Failing to get expected job		
	49. Dissatisfaction with your athletic skills		

α^1 - Cronbach's alpha coefficient. In this column the original factors for each item were presented (Kohn ir kt., 1990). 1 Factor – development challenge, 2 Factor - time pressure, 3 Factor – academic alienation, 4 Factor – romantic problems, 5 Factor – assorted annoyances, 6 Factor – general social mistreatment, 7 Factor – Friendship problems. The item did not contribute to the original factor structure if no factor is indicated. Adapted from "Factorial Validation of the Inventory of College Students' Recent Life Experiences on a Graduate International Student Sample." By Bodenhorn, N., Miyazaki, Y., Ng, K.M., & Zalaquett, C, 2009, *NC Perspectives*, 3, 3-12.

Construct validity

In order to test construct validity of the Inventory we analysed correlation of the Inventory with other instruments that address similar constructs. A correlation analysis (Spearman correlation) was performed to compare the Students' Recent Life Experiences subscales (based on the factorial analysis results in this study), the Student-Life Stress Inventory subscales (Gadzella, 1994) and Reeder scale (table 6).

Table 6. *Correlation (Spearman's rho) among the ICSRLE subscales, SSI and* Reeder scale.

Measure		ICSRLE subscales and general score						
		1	2	3	4	5	6	GS
SSI subscales	F	.442	.551	.517	.290	.235	.542	.497
	C	.413	.407	.346	.281	.183	.335	.386
	P	.408	.623	.285	.326	.250	.498	.415
	Ch	.538	.506	.442	.342	.507	.339	.342
	Si	.291	.288	.268	.262	.147	.216	.368
Reeder[1]		-.247	-.554	-.352	-.312	-.357	-.271	-.302

* p < .001

[1] lower scores of this scale indicated higher psychosocial stress levels. SSI - Student-Life Stress Inventory subscales (Gadzella, 1994), ICSRLE - Inventory of College Students' Recent Life Experiences (Kohn, 1990). Intercorrelations of ISCRLE subscales were presented in vertical columns, and intercorrelations of SSI subscales were presented in horizontal rows. ICSRLE subscales: 1 - Relationship problems, 2 - Lack of time, 3 - Social alienation, 4 - Future decisions, 5 - Academic dissatisfaction, 6 - Finance problems, GS - General score. SSI subscales: F – Frustrations, C – Conflicts, P – Pressures, Ch – Changes, Si - Self-imposed

Large correlations were identified between the Inventory of College Students' Recent Life Experiences and the questionnaire measuring students' academic stress level. Weak correlations were observed between Self-imposed stressors subscale scale of the Student-Life Stress Inventory (Gadzella, 1994) and Academic dissatisfaction (Inventory of College Students' Recent Life Experiences) (r = .147) and between Conflicts and Academic dissatisfaction respectfully (r = .183).

The Inventory of College Students' Recent Life Experiences was correlated with other instruments (Student-Life Stress Inventory; Reeder scale; Perceived stress scale; General sleep disturbance scale; Multidimensional Fatigue Inventory) measuring the same phenomenon (table 7).

Table 7. *ICSRLE and other instruments measuring similar phenomenon – correlation coefficients and descriptive statistics*

Scale	ICSRLE (Spearman's rho)	M	SD
ICSRLE	-	82.93	21.49
SSI	.661	113.64	26.20
PSS	.573	17.07	6.49
RS	-.434[1]	17.64	4.01
GSDS	.581	42.30	13.71
MFI	.340	52.58	13.93

* p < .001

Note. [1] lower score of this scale indicated higher psychosocial stress level. ICSRLE - Inventory of College Students' Recent Life Experiences; SSI - Student-Life Stress Inventory; RS - Reeder scale; PSS - Perceived stress scale; GSDS - General sleep disturbance scale; MFI - Multidimensional Fatigue Inventory. M – mean, SD – standart deviation.

A large correlation (r = .661, p < .001) was identified between the Inventory of College Students' Recent Life Experiences (ICSRLE) and Student-Life Stress Inventory demonstrated construct validity of the Inventory. The Inventory of College Students' Recent Life Experiences also were moderately correlated the Perceived stress scale (r = .573, p < .001) and Reeder scale (r = -.434, p < .001).

Researchers analysing students' academic stress suggested that higher levels of stress was related to unhealthy eating habits, low physical activity,

low self-esteem, suicidal tendencies, unhealthy behaviour, mental and somatic well-being, sleeping disturbances, increased fatigue and lower stress tolerance (Hudd et al., 2000, Gadzella, 1994, Kohn, Lafreniere, & Gurevich, 1990, Simons, Raluca, & Gaher, 2005, Smets, 1995, Lee, 1992). Relationship between the Inventory of College Students' Recent Life Experiences and other instruments, measuring sleep quality (GSDS), fatigue (MFI), as shown in table 7, demonstrated moderate links, indicating that higher academic stress levels were associated with lower quality of sleep (r = .581) and increased levels of fatigue (r = .340).

Discussion

The aim of the study was to investigate the psychometric properties (inner compatibility and structural validity of the scales) of the Lithuanian version of *The Inventory of College students' Recent Life Experience.* The study findings showed statistically acceptable level of reliability of the Lithuanian scale. The items of the scale demonstrated internal reliability, and the stability of test-retest results demonstrated external reliability. According to L. R. Aiken, test is reliable enough, if Cronbach's alpha coefficient of scales is equal or greater than .65. The Inventory demonstrated its suitability for either group or individual diagnostics (Aiken, 1979). It could be assumed that scale estimators did not dependent on the accidental state of research participants and the change of research circumstances.

Also in this study was aimed at determining whether the Lithuanian version of the scale also allowed to distinguish 7 factors, i.e., whether internal structure corresponds to the original structure of the scale. For this purpose were performed confirmatory and exploratory factor analyses. The performed analyses demonstrated a different structure of 6 factors using 36 items. The 6-factor structure included Relationships problems, Lack of time, Social alienation, Future decisions, Academic dissatisfaction, Financial problems. The results of this study indicated that structure of 6 factors including 36 items was better fit for Lithuanian students than original structure of 7 factors. 13 items of the original scale were not related to any of the resulting factor structure, namely: 1, 10, 14, 25, 32, 36, 38, 40, 41, 45, 47, 48, and 49.

Still, the analysis showed that the original scale could be used as an instrument measuring a single phenomenon (having eliminated certain questions from the original inventory: 1, 40, 41, 48, 49) i.e. the level of everyday stressors. The compatibility scores of the model confirmed single-factor structure of 49-item scale only partially, therefore it should be used with a certain amount of caution. *RMSEA* variable surpassed the suggested score according to Hu and Bentler (1999) recommendations but did not exceed the .1 limit when the model was considered to be unsuitable for data.

As exploratory and confirmatory factor analyses demonstrated a different structure of 6 factors using 36 items, internal reliability coefficients were calculated for the new factors. All coefficient alpha results for each subscale were reliable enough (5th table), i.e. Cronbach's alpha coefficients ranged from .662 to .880 (the lowest value for Financial problems subscale and the highest for Relationships problems subscale).

When comparing the factors of the inventory and the ones received in the present research, it could be noted that the structure of some factors is similar to the factors presented by the author after the analysis of the research with the students of North America. Lack of time, Social alienation, and Academic dissatisfaction factors had almost the same items as those presented by the author of the inventory (respectively Time pressure, General social mistreatment and Academic alienation), the factors presented by the Bodenhorn and co-workers (Time demands, Social alienation, Academic discord respectively). Thus, it could be stated that these factors were the least influenced by cultural differences; they were universal and vary little in the student population. The same could not be said about the composition of the remaining factors. In the present research, the first factor (Relationship problems) included items 17, 39, 31, 8, 6, and 12 from the original factors (Romantic problems, General social mistreatment, Friendship problems). The combination of these items generally covered relationship problems; therefore, the first factor in this research was named Romantic problems. The author's distinguished Development challenge factor distributed in different groups. The major part of items in the author's factors (Development challenge and Assorted annoyances) was not included into the structure of the factors of this research: 1, 10, 14, 25, 32, 36, 38, 40, 45, and 47 (Table 5). Such distribution of items could be explained by cultural differences. Combination of these items discloses different stress-causing situations where the role of coping with this situation may vary from culture to culture. Bodenhorn and co-workers (2007) analysed the data of international students by using factor analysis. According to their research, international students faced additional stress sources when coping with the stress, while native students may find certain stressors not so problematic. Items 20 and 23 in the original factor structure related to future carrier and education were not distinguished as a separate factor; according to Bodenhorn and co-workers' opinion, if a higher number of factors is determined during factor analysis, these two statements comprise a separate factor. In the present research, with even a small number of factors, items 20, 23 and 19 made up a factor *Future decisions*. It is interesting that in the case of Lithuanian student population this factor included statement 19 related to dissatisfaction with mathematical skills. In Bodenhorn's research, items 22 and 40 related to linguistic skills were distinguished as a separate factor with

the structure of more than 6 factors. In this research, item 40 was not included into the factor structure, while item 22, though in the weakest correlation, was included to the *Academic dissatisfaction* factor.

As Bodenhorn and co-workers (2007) analysed the stress international students were exposed to, it was believable that skills connected with linguistic competence caused more stress to international students than to those living in their native country. The authors suggested that if the inventory included more questions related to language it was much credible that they would fall under a separate factor as linguistic competence was a potential source of stress for international students. According to Misra and Catillo (2004), cultural differences could influence different interpretation of student life events, the level of academic stress and reactions to stressors. Misra and Catillo‘s research data showed that Americans demonstrated a higher level of academic stress and reacted to stressors more than international students (Misra, & Catillo, 2004). Thus it could be assumed that students living in Lithuania can experience more/less stress because of certain life situations in comparison with those living in the United States. This may lead to a different scale factor structure, as validation of the original inventory had been carried out with the students of North America.

To ground the validity of the construct, correlation analysis was used which demonstrated relatively strong links between *The Inventory of College students' Recent Life Experience* and *Student Life Stress* questionnaire subscales of similar content, as well as correlations of other scales measuring a similar phenomenon.

The strongest link was between *The Inventory of College students' Recent Life Experience* and *Student Life Stress* questionnaire (r = .661), the weakest one was between *The Inventory of College students' Recent Life Experience* and *Multidimensional Fatigue inventory* (r = .340). In many research findings criterion validity analysis often have been used with Perceived Stress Scale (Kohn, Lafreniere, & Gurevich, 1990, Bodenhorn, Miyazaki, & Ng, 2009, Amponsah, 2010).

Summing up the research data, it could be stated that the Lithuanian *Inventory of College students' Recent Life Experience* is characterised by sufficient psychometric properties which enables it to be used for scientific research. Though the suggested factor structure in this research was not distinguished by very good compatibility criteria, it suited the Lithuanian student population more than the original one. The implementation of this inventory in practice could help to improve the services offered to students, as well as to better understand students exposed to greater stress.

Limitations and implications for future research

One limitation of our study (as well also of other similar studies) was that it was a self-rated questionnaires instead of measuring physiological stress parameters. Further, comparison between physiological parameters of stress and self-knowledge instruments could be compared thus adding some more validity to paper-and-pencil instruments, measuring stress levels. Another limitation was that stressors, used in the Inventory of College students' Recent Life Experience may differ from those used in other instruments. It is also possible, that there may be some stressors unique to Lithuanian students, and which did not include in the original Inventory. This uniqueness may be due to some religious and/or cultural differences that could affect in some way the level of perceived stress.

In order to assure better external validity of the Inventory further studies should involve larger samples.

Conclusion

1. The analysis of the Lithuanian version of the *Inventory of College students' Recent Life Experience* psychometric properties demonstrated statistically acceptable level of internal and external reliability of the full sale and the subscales. These results were confirmed by calculating inner compatibility and test-retest measurement.

2. The Lithuanian version of the *Inventory of College students' Recent Life Experience* represented statistically acceptable level of content and construct validity, demonstrated by factor and correlation analyses. Using exploratory and confirmatory factor analyses suggested different structure containing 6 factors of 36 items, and better is fit to Lithuanian students than the original scale structure.

3. Psychometric properties of the Lithuanian version of the *Inventory of College students' Recent Life Experience* allowed using this scale for scientific research.

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