ASSESSMENT OF PERCEIVED STRESS, SOCIO-DEMOGRAPHIC AND ECONOMIC CHARACTERISTICS IN ROMANIAN ADULTS

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Abstract: *Background: Stress is one of the most important health-related and quality of life factor in the modern society. Measuring stress level and assessing the correlations with different personal characteristics became critical, both in social and medical and public health interventions. Objective: to assess the level of perceived stress in relationship with self evaluated socio –demographic and economic characteristics. Materials and methods: socio-demographic, economic characteristics, perceived health status and perceived stress level were assessed using a Personal characteristics self-evaluation questionnaire and Perceived Stress Scale 14 items (Cohen et all, 1983), in a sample of 928 adult subjects, selected through "snow ball method" from three historical regions of Romania– Moldavia, Muntenia, Transilvania. Results: Similarities to other studies were noticed in overall score, by gender, or according to education or economic statute. Perceived stress level has been higher in women, increased from younger to older groups and decreased for subjects with higher education level and higher average income per family member. Subjects from urban environment seemed to be less stressed than rural and differ by geographic regions. Conclusions: PSS 14 is a valuable and easy to apply tool that should be used as a routine instrument for situation scan in medical, public health and social interventions.*

Cuvinte cheie: *adulţi, scala stresului perceput, caracteristici personale, sănătate, corelaţii*

Rezumat: *Stresul reprezintă unul dintre cei mai importanţi factori ce influenţează starea de sănătate şi calitatea vieţii în societatea modernă. Măsurarea nivelului stresului şi analiza corelaţiilor cu diferitele caracteristici personale a devenit o necesitate, atât pentru intervenţiile din domeniul medical cât şi social. Obiectiv: evaluarea nivelului stresului perceput în relaţie cu caracteristicile socio-demografice şi economice. Materiale şi metodă: caracteristicile socio-demografice, economice, starea de sănătate percepută au fost evaluate utilizând un Chestionar de autoevaluare a caracteristicilor personale, iar nivelul stresului perceput a fost măsurat cu ajutorul Scalei Stresului Perceput 14 itemi (Cohen et al, 1983), într-un lot de 928 de subiecţi adulţi, selectaţi prin "metoda bulgărelui de zăpadă" din trei regiuni geografice din România – Moldova, Muntenia, Transilvania. Rezultate: Nivelul stresului perceput a fost mai mare la femei, creşte odată cu vârsta şi este invers corelat cu nivelul de educaţie şi cel al veniturilor pe membru de familie. Subiecţii din mediul urban par mai puţin stresaţi decât cei din rural. Există similarităţi cu rezultatele din alte studii în ceea ce priveşte scorurile generale, pe sexe şi în funcţie de educaţie şi venituri. Concluzii: PSS 14 e un instrument valoros, uşor de aplicat şi ar putea fi folosit ca test de rutină pentru măsurarea nivelului stresului în analiza de situaţie pentru intervenţiile din domeniul medical, social şi al sănătăţii publice.*

INTRODUCTION

Stress is an important area of study in the modern society, being related to adaptative functioning (including social competence, health status and quality of life) and also to satisfaction and morale.(1) Stress arises when a person perceives some change in the environment as threatening or demanding while he or she does not have an appropriate coping response.(2,3) Measuring perceived stress level and assessing the relation with different personal characteristics became very useful not only for scientific purposes, but especially for different public health, medical and social interventions.

PURPOSE

The main purpose of this study was to evaluate the level of perceived stress in an adult population and to assess the potential relations between different levels of perceived stress and different socio-demographic and economic characteristics.

METHODS

The study was cross-sectional, conducted on a sample of 928 subjects, adults (over 18 years old), selected using "the snow ball method", from three different geographic regions – Moldavia, Muntenia, Transilvania. As tools for data collection, we used two self–administrated on paper questionnaires: a personal characteristics self-evaluation questionnaire and the Perceived Stress Scale 14 items (PSS-14).(4,5)

The personal characteristics self-evaluation questionnaire included 10 questions about place of living, age, gender, education, professional status, level of income per

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family member, perceived present health status (scale and score), perceived present stress level (scale and score).

PSS is a self-reported questionnaire that was designed to measure "the degree to which individuals appraise situations in their lives as stressful".(4) We have chosen to use the 14 items scale (simplified scales with ten items and four item are also mentioned).(5) The PSS is considered one of the most robust and reliable primary psychological instrument for measuring perceived stress, in community based studies, for different categories of subjects.(5) It is proposed to make comparisons between individuals' perceived stress related to current, objective events. PSS comprises fourteenth items covering a number of direct queries about the current levels of stress experience such as feelings and thoughts during the last month. The responses of PSS-14 varying from 0 to 4 for each item and ranging from never, almost never, sometimes, fairly often and very often respectively on the basis of their occurrence during one month. Items 1, 2, 3, 8, 11, 12 and 14 are negatively stated and the response "never" is quantified as 0 points. Items 4, 5, 6,7, 9, 10 and 13 are the positively stated items and the response "never" is quantified in 4 points. PSS-14 scores are obtained by summing across all 14 items. The scale yields a single score with high scores indicating higher levels of stress and low scores indicating lower levels of stress. There is no specified threshold, therefore, the scale can produce a range of scores from 0 to 56.(5) For sample selection, a single exclusion criterion has been applied, regarding the level of education, due to the fact that PSS 14 has been validated only for persons with minimum junior high. A Romanian version of the PSS 14 scale, used in two previous studies, has been applied to responders.(6,7)

DATA ANALYSIS

We investigated the PSS overall score in relation to gender, age, geographical area, education and income. The age was analyzed globally and by categories according to other published data (18 – 29; 30 – 44; 45 – 54; 55 – 64 and 65+).(5) The geographical area was analyzed as rural/urban environment and as historical region of the country (Moldova, Muntenia and Transilvania). Education has been classified using ISCED in three levels: low education (ISCED levels 1 and 2, meaning eight years of education), medium education (ISCED 3 and 4, meaning more than eight years of education, including qualifications) and high education (ISCED levels 5-8, meaning at least an university degree).(8)

The income per family member has been classified in seven groups: less than 500 lei; 500 – 999lei; 1000 - 1499 lei; 1500 - 1999 lei; 2000 - 2499 lei; 2500 - 2999 lei and over 3000 lei.

Means and standard deviations or medians were calculated for the continuous symmetric variables. The normality was assessed using the Kolmogorov-Smirnov test. The non-symmetric scale variables were reported as medians (range). Nonparametric tests (Mann–Whitney *U*-test or Kruskal Wallis) were used for comparison. A p-value <0.05 was considered for statistical significance (two tailed test). Categorical data were presented as proportions with one decimal. Proportions were compared by using Chi square test ($p<0.05$). Microsoft Office Excel 2007 for Windows was used for data entry.

Statistical analysis was performed with SPSS software, version 17.0.

RESULTS

Out of 1000 people who were asked to complete the questionnaires, according to initial research plan, 933 accepted to participate (response rate 93,3%). Five sets of questionnaires have been invalidated, due to missing answers to more than 2 questions per questionnaire.

Finally, we investigated 928 subjects that answered to the questionnaire, among which 65.3 were females (male:female ratio of 1:2). Mean age was 40.22±13.109 years (18 – 90 years) and median age was 38 years. By age category, more than half of the subjects were young adults (21.9% and 45% of subjects were 18 – 29 years old and 30 – 44 years old respectively). The subjects came from 27 counties and from Bucharest. Most of the subjects lived in urban areas (77.7%). As geographic region, 28.8% came from Muntenia, 47.3% from Moldova and 23.9% Transilvania. 69% of our responders had high education and 24.5% and 6.6% had medium and low education respectively. PSS scores by personal characteristics are shown in table no. 1.

Table no. 1. PSS 14 scores by personal characteristics

Variable	No	%	Mean PSS score ± SD	Range	Median	p-value*
Overall	928	100.0%	22.69 ± 6.73	1 - 46	23	NA
Gender						
Males	322	34.7%	21.12 ± 6.97	1 - 43	21	<0.001
Females	606	65.3%	23.52 ± 6.45	4 - 46	24	
Age group						
18 - 29	203	21.9%	21.93 ±6.32	4 - 43	22	0.374
30 - 44	418	45.0%	22.10 ± 7.11	1 - 41	22	0.062
45 - 54	181	19.5%	23.44 ±5.94	1- 40	24	0.473
55 - 64	75	8.1%	24.23 ±6.58	7 - 43	24	0.709
65+	51	5.5%	24.80 ±7.15	6 - 46	24	NA
Environment						
Urban	721	77.7%	22.28±6.74	1 - 43	22	<0.001
Rural	207	22.3%	24.13±6.53	2 - 46	24	
Region						
Muntenia	267	28.8%	23.73±6.80	6 - 46	24	0.011
Moldova	439	47.3%	22.98±6.39	1 - 41	23	
Transilvania	222	23.9%	20.86±6.98	1 - 37	21	
Education						
inferior	61	6.6%	26.57±7.09	11 - 46	26	0.013

medium	227	24.5%	23.82±6.37	1 - 43	24	<0.001
high	640	69.0%	21.92±6.64	1 - 41	22	NA
Income						
<500 lei	103	11.1%	25.62±6.70	7 - 43	26	0.002
500 – 999lei	219	23.6%	23.06±6.76	2 - 46	24	0.085
1000 - 1499 lei	220	23.7%	22.09±6.44	1 - 41	22.5	0.371
1500 - 1999 lei	139	15.0%	21.71±6.10	8 - 36	22	0.088
2000 - 2499 lei	76	8.2%	23.30±7.20	6 - 41	23.5	0.224
2500 - 2999 lei	53	5.7%	21.77±6.67	4 - 37	22	0.963
3000 lei or above (700 EUR).	118	12.7%	21.72±7.0	1- 40	21	NA

** T student test or Non-parametric tests (Mann Whitney or Kruskal Wallis/Median), according to distribution*

The overall **PSS 14 score** varied from 1 to 46 in our sample, with a mean of 22.69 and a median of 23. **Gender:** A significant difference was found by gender, women being apparently more stressed. Women had a 2.4 higher mean score compared to men and a higher median (p<0.001).

Age: A weak, direct but significant correlation was found between PSS14 score and age (r=0.131, p<0.001). Apparently the mean PSS score increased by age-group, from 21.93 in subjects aged 18 – 29 years to 24.80 in subjects aged 565 years or over, but the differences between successive age-groups were not significant.

Environment: Differences were identified between the rural and the urban subjects, both at mean (24,13 vs 22,28) and median (24 vs. 22, p<0.001) PSS score level, in favour of urban people who seems to be less stressed. Significant differences were found also by **geographic region,** Transilvania being apparently most favoured, compared to the other two regions. No differences were found between Muntenia and Moldova (p=0.223).

Education: Increased education seemed to be related to lower stress score. A negative, weak, significant correlation was shown between level of education and PSS scores (r=-0.179, p<0.001). Significant differences were found among neighbour level of education.

Income: Similar to education, income had a negative, weak and significant correlation to PSS scores (r=-0.143, p<0.001), meaning that increased income is accompanied by lower level of stress. However, significant differences in scores in neighbour groups of income were found only for the first two groups.

DISCUSSIONS

An overall remarque might be the fact that the high response rate (93,3%) may suggest a very high interest for this topic among the investigated group.

Our results are consistent to other studies that aim to validate the use of PSS-14 in different populations (table no. 2).

Table no. 2. Comparison among different studies results related to PSS-14

Study	Our study	Cohen et al, 1988	Andreou et al, 2011 (11)	Remor et al, 2006 (12)
No subjects	928	2387	941	440
Country	Romania	USA	Greece	Spain
Overall score	22.69 ± 6.73	19.62±7.49	unknown	25.0±8.1
Gender				
Males	21.12 ± 6.97	18.8±6.9	23.48±7.77	23.6±7.8
Females	23.52 ± 6.45	20.2±7.8	25.64±7.89	26.6±8.1
Result by gender	significantly lower score in males	significantly lower score in males	significantly lower score in males	significantly lower score in males
Age groups				
18 - 29	21.93 ±6.32	21.1±7.2	Other categories	Only Spearman correlation
30 - 44	22.10 ± 7.11	19.6±7.3		
45 - 54	23.44 ±5.94	19.1±7.1		
55 - 64	24.23 ±6.58	18.3±8.1		
65+	24.80 ±7.15	18.5±7.8		
Result by age	Significant increasing by age; r= 0.131, p<0.001	Significant decreasing by age; r=-0.13; p<0.001	Significant decreasing by age	Significant decreasing by age ; r=-0.18 p<0.001
Education	increased education - related to decreased stress	increased education - related to decreased stress	Not explored	Not explored
Income	increased income is related to decreased stress	increased income is related to decreased stress	Not explored	Not explored
Cronbach Alpfa	0.746 / 0.878*	0.75	0.82	0.81

As an overview, both mean and median PSS 14 scores of analyzed sample have moderate values, mean level of perceived stress representing only 41% of the maximum level. The results are pretty surprising, taking into account that the study has been performed in May - October 2012, a period characterized by political and economical instability.

Similarities to other studies were noticed in overall score, by gender, or according to education or economic statute. Perceived stress level has been higher in women, increased from younger to older groups and decreased for subjects with higher education level and higher average income per family member. Subjects from urban environment seemed to be less stressed than rural, which is quite unexpected due to the complex challenges from urban environment. The difference could be related to differences in other variables or to the lack of representativity (we used the snow-ball method for selection).

A constant difference was found by age compared to all other studies. This could be related to sample selection or to the cultural difference between people, potentially influenced by the socio-economical situation in the country.

On another hand, we use a Romanian version of PSS-14 questionnaire that has been used previously in other two studies in Romania.(6,7) However, we were not able to find publications related to validation of the Romanian version.

We evaluated the internal consistency which was adequate (Cronbach's Alpha 0.746 and standardised item 0.878).

No other explorations were performed on the tool validity. The influence of the demographic characteristics to the PSS-14 score was explored through a regression analysis.

Only 11% of the PSS-14 score variance was explained by the demographic factors. Further research in necessary to evaluate the validity of the PSS-14 an to understand the other influencing factors on the stress perception in Romania.

CONCLUSIONS

Applying PSS-14 in our study to a sample of Romanian adults revealed the fact that this questionnaire is easy to use and provides results that are consistent with those from other studies. Additional research is necessary to analyse validity and to identify the other factors which may influence perceived stress level in Romanian adult population.

Taken into consideration that a high perceived stress level is related to higher risk of health problems (3,4,5,6) and, on the other hand, the groups with the highest level of perceived stress seems to be the same as included in the vulnerable categories from medical, public health and social perspective, we consider that perceived stress level assessment should be a part of the routine tests, applied in situation scan for any intervention in the mentioned above domains.

REFERENCES

1. Lazarus RS, Blackfield Cohen J. Environmental stress. In Human Behavior and Environment. Advances in Theory and Research Volume 2. Springer US; 1977. p. 89.
2. Lazarus RS. and Folkman S. Stress, Appraisal and Coping. Springer, New York; 1984.
3. Lazarus RS. The concepts of stress and disease. In Society, Stress and Disease, L. Levi Editor. Oxford University Press: London; 1971.p. 53-58.
4. Cohen S, Kamarck T and Mermelstein R. A global measure of perceived stress. J Health Soc Behav. 1983;24:385-396.
5. Cohen S and Williamson G. The Social Psychology of Health. Sage Publications, London; 1988.
6. Mihailescu A, Matei V, Cioca I, Iamandescu IB. Perceived stress – predictor of anxiety and depression in a group of first year medical students. Medical Practice IV. 2011;22(2).
7. Pascanu R, Lupas C, Ardelean D, Spatarel D, Stoleru M. Ivestigating the quality of life of the medical team in psychiatric facilities.
8. ISCED 2011 Original UNESCO General Conference document, in multiple languages. Available at: http://www.uis.unesco.org/EDUCATION/Pages/international-standard-classification-of-education.aspx.
9. Al Kalaldeh MT, Abu Shosha GM. Application of the perceived stress scale in health care studies. Analysis of literature. International Journal of Academic Research Part B; 2012;4(4):45-50.
10. Iamandescu IB. Socio-professional risc factors. In: Iamandescu IB, ed. Manual of Medical Psychology. Bucureşti: Ed. Infomedica; 2010. p.76-78.
11. Andreou E, Alexopoulos, EC, Lionis C, Varvogli L, Gnardellis C, Chrousos GP, Darviri C. Stress Scale: Reliability and Validity Study in Greece. In Int J Environ. Res Public Health. 2011;8:3287-3298.
12. Remor E. Psychometric Properties of a European Spanish Version of the Perceived Stress Scale (PSS), in the Spanish Journal of Psychology. 2006;9(1):86-93.