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The relationship between stress and personality factors

Voichita M. Dumitru, and Doina Cozman

Department of Clinical Psychology, "Iuliu Haţieganu" University of Medicine and Pharmacy Cluj-Napoca, Cluj, Romania

Abstract. Objective: The aim of the present study was to investigate the stress level in a group of nurses and to correlate the stress level and its subsequent symptoms with personality factors. Materials and Methods: The study was conducted on 34 psychiatric nurses, 68% of them being female. The average age of the male subjects was 32.25 years with a standard deviation of 6.21 years, while the average age of the female subjects was 35.18 years, with a standard deviation of 8.03 years. The analysis focused on the stress level, stress symptoms, age, duration of employment and personality factors. Results: The findings showed that female staff members were more affected by stress as they grow older and have spent a longer time on the job, while male staff members were subjected to higher stress levels at the beginning of their activity. Correlations between personality factors and stress both in concerns of perceived stress and the level of subsequent stress symptomatology were identified. High stress levels were identified in people with low social presence ($r=-0.417$, $p=0.01$) and low empathy ($r=-0.393$, $p=0.02$). A higher intensity of psychological symptoms following stress was also associated with low social presence ($r=-0.379$, $p=0.03$), low empathy ($r=-0.465$, $p<0.01$), low independence ($r=-0.347$, $p=0.04$), low good impression ($r=-0.380$, $p=0.03$), low well-being state ($r=-0.429$, $p=0.01$), low tolerance ($r=-0.484$, $p<0.01$), low intellectual efficiency ($r=-0.406$, $p=0.02$), low psychological intuition ($r=-0.437$, $p=0.01$), low work orientation ($r=-0.463$, $p<0.01$) and increased femininity ($r=0.431$, $p=0.01$). Conclusion: Several personality factors, such as social presence, empathy, independence, good impression, intellectual efficiency, psychological intuition, work orientation, femininity render individuals more vulnerable to stress. There are significant differences between females and males in what concerns stress adaptation.

Key Words: stress, symptoms, personality factors.

Corresponding Author: V. M. Dumitru, voichitadumitru@yahoo.com

Introduction

Stress represents a normal, necessary and unavoidable life phenomenon which can generate temporary discomfort as well as long-term consequences. The concept of stress was introduced in the medical terminology as early as 1936 by the Canadian philosopher Selye. He describes "the general adaptation syndrome" (GAS) as the body's effort to respond to the demands of the environment (Selye 1977). Scientific data confirm the idea that personality is an important factor in identifying, responding and approaching stress events. In recent years, a growing number of researchers have put a lot of effort in identifying the individual characteristics that influence the relationship between stimuli and stress reactions. It is a well-known fact that the perceived stress depends on the degree of congruence between the individuals and their environment, so that the individual experiences stress only if the particular situation is assessed as being threatening (de Jong & Emmelkamp 2000).

Research carried out in 2000 identified relationships between physical health and positions characterized by increased repetitiveness, monotony, sustained vigilance and working in shifts (Le Blanc et al 2000). According to these studies, stimuli with stress-generating potential within an organization can be divided into four big classes: work content, work conditions, employment conditions and the social network in the workplace. The results of a survey on health professionals carried out in 2005 demonstrate that personal relationships with the patients are very demanding and require empathy and emotional involvement. In the medical profession emotion management is considered an essential part of the job (Best *et al* 2005). Other researchers show that increased exposure of women to daily stress, including professional stress, is caused by their marital and parental roles (Kiecolt-Glaser & Newton 2001). Many researchers consider self-confidence to be an important coping resource. Individuals with a high self-confidence level are more predisposed towards adopting more effective stress-coping strategies than those with low self-confidence levels (Cassidy & O'Connor 2004). Personality types are important factors in determining stress, being thus capable of explaining how certain people manage to function for years while handling huge amounts of stress, whereas others collapse after several months under similar amounts of stress (Cooper 2005). The types of personality that feature robustness as a trait demonstrate over time resistance to stress and psychological protection against the most difficult life events (Cosman 2010). A key-component of robustness is provided by the coping mechanism of these people, which involves an active modification of the perception of the stressful event, by approaching it as a challenge that they are capable to overcome (Landy & Conte 2004). People with an optimistic

outlook towards life experience everyday events in a positive manner and have positive expectations regarding the results of their actions (Kivimaki *et al* 2005). Both optimistic and pessimistic persons spontaneously employ various coping strategies to deal successfully with stressful events. Optimism is conceptually related to active, complex coping strategies and attracting supportive social relationships. Extroversion-introversion represent intensely studied stress-shaping personality factors. Introverts get easily stressed out because of the anxious, pessimistic nature of their personal structure and their tendency towards perfectionism (Mc Crae & Costa 1986). Individuals characterized by high levels of extraversion are engaged in emotion-based coping strategies, as well as in self-blaming and avoidance. Other theories consider that both the introvert and the extrovert share characteristics that have equal impact on stress vulnerability, if these exceed the average (Iamandescu 1993). The design of stress reduction strategies must take into account stress factors and the psychological implications of stress as well as the individual's personality type.

Aim

The purpose of the present study was to investigate the stress phenomenon among the nurses who work in Psychiatry and to correlate stress levels and subsequent symptoms with personality factors.

Table 1.CPI personality factors

Group	Factor	Factor abbreviation
	Dominance	Do
	Capacity for status	Cs
	Sociability	Sy
I	Social presence	Sp
	Self-acceptance	Sa
	Independence	In
	Empathy	Em
	Responsibility	Re
	Socialization	So
	Self-control	Sc
II	Good impression	Gi
	Communality	Cm
	Well-being	Wb
	Tolerance	To
	Achievement through conformity	Ac
III	Achievement through independence	Ai
	Intellectual efficiency	Ie
	Psychological intuition	Py
IV	Flexibility	Fx
	Feminity/Masculinity	Fe
Secondary scales	Management potential	Mp
	Work orientation	Wo
	Creative temperament	Tc

Materials and Methods

The research sample consisted of 34 qualified nurses who attended at least 3 years of specialized studies and have a minimum of 1 year of experience. Their work schedule is divided into three 8-hour shifts during weekdays and two 12-hour shifts during the weekend. Our study was observational, transversal and analytic. The study was conducted between October and December 2008, the sample being represented by all nurses from 3rd Psychiatric Clinic Cluj-Napoca.

A number of three questionnaires were used in this study: California Psychological Inventory (CPI), "How stressed are you?", and "Psychological symptoms scale". The aim of the research has been explained to all nurses and each nurse received the three questionnaires that were filled in the presence of the researcher during a session of 80 minutes (40 minutes for CPI, and 20 minutes for "How stressed are you?", and "Psychological symptoms scale").

The CPI, comprising 462 items, has been applied on our sample. The mean and the median of the coefficients for internal consistency applied to the Romanian version of the CPI+462 test was 0.69 (Pitariu *et al* 2006). The standard scales are divided into four groups of psychological significance. Thus, the first group comprises those scales that indicate self-actualization dimensions. The second group comprises the scales that indicate value options and inter-relational maturity. The third group of scales measures the motivational level seen as one's personal accomplishment potential and focuses on intellectual values, while the fourth group comprises scales that reveal intellectual approaches that shape personal style. Three secondary scales were also utilized. The personality factors that were analyzed are presented in Table 1.

The test "How stressed are you?", a stress perception test, designed by T. Hindle in 2001 (Hindle 2001), consisted of 32 items whose answers range from 1 to 4.

The scores obtained by adding up the results on each item reveal the following stress levels:

• 23-46 points – the person manages to dominate stress very well and acquires an optimal balance between negative and positive stress;

• 47-67 points – an acceptable level of stress is noticeable, but certain aspects have to be improved;

• 68-92 points – the stress level is very high and one has to identify methods to reduce it.

The "Psychological symptoms scale" designed by Birkenbihl in 2000, consisting of 29 items which actually represent symptoms that occur frequently, regularly or permanently in a stressed out person (Birkenbihl 2000). There are three levels of interpretation that result from adding up the number of identified symptoms:

• < 3 symptoms: the person is not affected by stress;

• 3-6 symptoms: low level of stress;

• > 6 symptoms: high level of stress.

The data was statistically processed using the Statistical Pack for Social Sciences (SPSS v. 15.0). The Kolmogorov-Smirnov test was used to evaluate normal distribution of data. Student t-test for independent samples was used to compare normal distributed values according with gender. Whenever data were not normal distributed, the comparison were made with Mann-Whitney test. Correlation between variables was assessed by calculating Pearson correlation coefficient for normal distributed

data; otherwise the Spearman correlation coefficient was used. The tests and correlations were carried out at a significance level of 5%.

Results

The average age of the male subjects was 32.25 with a standard deviation of 6.210, while the average age of the female subjects was 35.18, with a standard deviation of 8.028. Descriptive statistics associated with years, years of working in the field, stress perception and psychological symptoms are presented in Table 2.

Table 2. Descriptive statistics of investigated variables

Gender	Parameter	Age (years)	Seniority (Years)	SPS	SSP
Female	Min	22	1	43	1
	Max	54	35	90	18
	Median	33,5	11,5	64	6
	Q_1	29,25	4,25	59,5	4
	Q_3	39,75	18,75	68,75	10
Male	Min	26	2	33	0
	Max	43	19	81	12
	Median	31	6,5	54,5	2,5
	Q_1	26	3,75	51,75	0
	Q_3	38	8,5	60,25	4

Seniority = Length of employment;

SPS= Stress perception; SSP= Psychological symptoms;

Q_1 = first quartile; Q_3 = third quartile

Women obtained higher scores compared with male employees, both from the point of view of the stress level and the symptoms that it triggers. The mean scores of female and male employees are presented in Table 3.

Table 3. Differences according with gender (22 female vs. 12 male)

Variable	Gender	m±StDev	P-value
Age (years)	Female	35.18±8.028	n.s.[a]
	Male	32.25±6.210	
Seniority (Years)	Female	12.00±8.950	n.s.[a]
	Male	7.08±4.582	
Psychological symptoms	Female	65.68±13.239	0.0362[a]
	Male	55.25±12.046	
Stress perception	Female	7.64±5.215	0.0446[b]
	Male	2.92±3.476	

n.s. = not statistically significant; m = arithmetic mean;

StDev= standard deviation;

[a] = Student t-test for independent samples

[b] = Mann-Whitney test

A moderate positive significant correlation (ρ=0.440; p=0.041) has been identified between age and psychological symptoms for female. Moreover, the good relationship between psychological symptoms and stress perception has identified in female group (ρ=0.664, p=0.001). The male proved having psychological symptoms at the beginning of their employment (ρ = -0.635, p = 0.027).

The difference between genders in regards to psychological factors was tested using t-test and the results are presented in Table 4.

Table 4. Differences of psychological factors according with gender

Parameter	Gender	Mean±StDev	Statistic (p-value)
Sp	Female	21.70±4.466	-2.084 (0.045)[a]
	Male	25.00±4.000	
In	Female	17.17±4.509	-1.085 (0.286)[a]
	Male	18.82±3.157	
Gi	Female	18.39±7.353	0.339 (0.736)[a]
	Male	17.55±5.373	
Wb	Female	28.48±4.926	-1.899 (0.067)[a]
	Male	31.64±3.529	
To	Female	17.48±3.918	-1.291 (0.206)[a]
	Male	19.27±3.495	
FM	Female	19.61±3.858	5.041 ($1.77 \cdot 10^{-5}$)[a]
	Male	13.18±2.442	
Wo	Female	26.57±4.698	-1.104 (0.278)[a]
	Male	28.27±2.901	
Em	Female	18 (16; 21)[b]	-1.022 (0.326)[c]
	Male	18 (17; 23)	
Ie	Female	28 (25; 32)	-1.461 (0.153)[c]
	Male	32 (29; 33)	

[a] = Independent Student t-test (degrees of freedom = 32); [b] = median (Q_1 = first quartile; Q_3 = third quartile); [c] = statistics for comparison of two independent samples – non-parametric test; Sp = Social presence; In = Independence; Gi = Good impression; Wb = Well-being; To = Tolerance; FM = Femininity / Masculinity; Wo = Work orientation; Em = Empathy; Ie = Intellectual efficiency

The link between stress and personality factors, expressed as correlation coefficients and associated significance are presented in Table 5.

Discussion

Personality types are important factors in determining stress, being able to explain how certain people manage to function for years while handling huge amounts of stress, whereas others collapse after several months under similar amounts of stress (Cooper 2005). The Big Five personality questionnaire has been used to investigate the influence of the learning style and personality to perception of work, workspace climate, stress, burnout and satisfaction within physicians age around 30 years (McManus 2004). The, study demonstrate differences in approach to work and perceived workplace climate seem mainly to reflect stable, long-term individual differences in doctors themselves, reflected in measures of personality and learning style. Stress, burnout and satisfaction also correlate with trait measures of personality taken five years earlier (McManus *et al* 2004). The personality trait known as conscientiousness has been found to be a significant predictor of performance in medical school. Additional traits concerning sociability i.e. extraversion, openness, self-esteem and neuroticism have been identified to be also relevant particularly

in the applied medical environment (Doherty & Nugent 2011).

Table 5. Results of relationship analysis between perceived stress and psychological factors, and between psychological symptoms and personality factors

Relationship between	Female	Male
SPS-Sp	-0.494 (0.017)[a]	0.063 (0.853)[a]
SPS-In	-0.368 (0.084)[a]	0.114 (0.738)[a]
SPS-Em	-0.561 (0.005)[b]	-0.102 (0.765)[b]
SPS-Gi	-0.243 (0.263)[a]	-0.518 (0.103)[a]
SPS-Wb	-0.331 (0.123)[a]	0.182 (0.593)[a]
SPS-To	-0.070 (0.750)[a]	0.046 (0.894)[a]
SPS-Ie	-0.360 (0.092)[b]	0.238 (0.481)[b]
SPS-Fm	0.285 (0.187)[a]	-0.378 (0.252)[a]
SPS-Wo	-0.374 (0.079)[a]	0.052 (0.879)[a]
SSP-Sp	-0.379 (0.074)[a]	0.036 (0.917)[a]
SSP-In	-0.351 (0.101)[a]	-0.078 (0.820)[a]
SSP-Em	-0.524 (0.010)[b]	-0.155 (0.649)[b]
SSP-Gi	-0.424 (0.044)[a]	-0.472 (0.143)[a]
SSP-Wb	-0.416 (0.048)[a]	-0.067 (0.846)[a]
SSP-To	-0.461 (0.027)[a]	-0.395 (0.229)[a]
SSP-Ie	-0.426 (0.043)[b]	0.129 (0.707)[b]
SSP-Fm	0.394 (0.063)[a]	-0.365 (0.269)[a]
SSP-Wo	-0.463 (0.026)[a]	-0.250 (0.458)[a]

SSP = Psychological symptoms; SPS = Stress perception;

[a] = Pearson's correlation coefficient; [b] = Spearman's correlation coefficient;

Sp = Social presence; In = Independence; Gi = Good impression; Wb = Well-being; To = Tolerance; FM = Femininity / Masculinity; Wo = Work orientation; Em = Empathy; Ie = Intellectual efficiency

Research studies on physicians disciplined by state medical boards showed specific types of unprofessional behavior to be predictive of later disciplinary action. Physicians who demonstrated unprofessional behavior during medical school versus those who did not scored significantly lower on four CPI scales. Results are consistent with findings in which general unprofessional behavior during medical school can be further characterized to domains of irresponsibility, lack of self-improvement, and poor initiative (Hodgson *et al* 2007). According to our knowledge, our study is the first on Romanian health care personal that investigated the relationship between personality and stress using the CPI carried on nurses. This study represents a part of a research focused on the relation between stress of workers in health care and personality traits.

The analysis of demographic characteristics (Table 2) of the nurses included in the analysis revealed the following:

• The ages of female and male nurses were similar, with the maximum age seen at female. This could be explained by the policy of employment before Romanian revolution (1989).

• The maximum length of employment is observed to female (35 years for female compare to 19 years for male). Overall, the female spent a longer time on the job compared to male.

• The female staff members had a higher score of perception of stress compared to male. The difference was of 10.

• The female perceived a score of psychological symptoms higher almost 3 times compared to male.

No statistically significant difference had been observed between female and male in regards of age and length of employment (Table 3). The female proved both more affected by stress compared to male staff (p=0.003, Table 3) and with more psychological symptoms (p=0.04, Table 3). Moreover, the female seems to had more psychological symptoms as the get older (significant correlation since p < 0.05) while the psychological symptoms are directly related to stress perception (statistically significant moderate correlation). Psychological symptoms were inverse related with the length of employment for male.

The female included in our study proved having a lower statistically significant social presence compared to male (p<0.05, Table 4). A difference at the border (6.7%) has been identified to well-being, with a slightly lower score to female compared to male while a high statistically significant difference in the perception of femininity/masculinity has been observed (Table 4). Thus, the results of our study demonstrate the influence of personality factors, quantified through the California Personality Inventory (CPI), in shaping stress response. High stress levels were identified in people with low score for social presence (expressed as reserved, do not express his/her opinion, prudent, with predisposition to feelings of guilty.

The analysis of the results presented in Table 5, regarding the relationship between perceived stress and psychological factors, and between psychological symptoms and personality factors revealed the following:

• Stress perception was statistically significant inverse related with social presence and empathy for female (p<0.05)

• Psychological symptoms were statistically significant inverse related with empathy, good impression, well-being, tolerance, intellectual efficiency and work orientation.

• No statistically significance relationships between perceived stress and psychological factors or between psychological symptoms and personality factors were identified for male (p>0.05).

Important symptoms related to stress are seen also persons with lack confidence, those with low independence, easily irritated and angry, who insist doing things as they consider even if this generates conflicts (low good impression), as well as to persons with low-being state. Persons that obtained low scores to tolerance (lack of confidence in the people, who criticize the opinion of other persons, self-centered, hostile and vengeful), to intellectual efficiency (people with difficulties to perform cognitive tasks that preferred dealing with tangible problems rather than with concepts and abstractions), to empathy (indifferent people, lacking motivation, concerned over what people do than what they feel or think) as well as work orientation (people fickle, easily distracted from tasks priority, with fluctuating moods). Several symptoms related with stress are seen to sensible male, concerned with aesthetic and modest women, dependent that had higher scores to femininity/masculinity.

The main limitation of the present study is related with the size of the sample. Presented results must be interpreted with a degree of caution but reflect the reality of the studied sample. The results could not be extrapolated to the population due to the

restricted studied sample size. This research should be seen as the first step in analysis of link between perceived stress and psychological factors, and between psychological symptoms and personality factors but further analysis on larger sample size using multi-centers assessments must be done in order to obtain reliable results able to present what is happen in the population.

Conclusion

Several personality factors, such as social presence, empathy, independence, good impression, intellectual efficiency, psychological intuition, work orientation, and femininity render individuals more vulnerable to stress. There are significant differences between females and males in what concerns stress adaptation.

References

Best, R. G., Stapleton, L. M., Downey, R. G. 2005 Core Self-Evaluations and Job Burnout: The Test of Alternative Models. Journal of Occupational Health Psychology, 10(4):441-451.

Birkhenbil, V., 2000. Stresul-un prieten preţios?, Bucureşti, Ed. Gemma Pres.

Cassidy, C., O'Connor, L. C., 2004. Perceived Discrimination and Psychological Distress: The Role of Personal and Ethnic Self-Esteem. Journal of Counseling Psychology, 51(3):329-339.

Cooper, I. D., 2005. Approaching Burnout. South African Family Practice 47(2):5-8.

Cosman, D., 2010. Psihologie medicala, Ed. Polirom, 14(8), pp. 300-302.

Doherty, E. M., Nugent, E., 2011. Personality factors and medical training: a review of the literature. Medical Education 45:132-140.

Hindle T., 2001. Cum să reducem stresul, Bucureşti, Ed. RAO.

Hodgetts, R. M., 1991. Organizational Behavior. Theory and Practice, New York, Macmillan Publishing, p. 336.

Hodgson, C. S., Teherani, A., Gough, H. G., Bradley, P., Papadakis, M. A., 2007. The relationship between measures of unprofessional behaviour during medical school and indices on the California Psychological Inventory. Acad Med 82(10 suppl):S4-7.

Iamandescu, B. I.,1993. Stresul psihic şi bolile interne. Editura All Bucureşti.

de Jong, G. M., Emmelkamp, P. M., 2000. Implementing a Stress Management Training: Comparative Trainer Effectiveness. Journal of Occupational Health Psychology 5(2):309-320.

Kiecolt-Glaser, J. K., Newton, T. L., 2001. Marriage and health: His and hers. Psychological Bulletin 127(4): 472-503.

Kivimaki, M., Vahtera, J., Elovainio, M., Helenius, H., Singh-Manoux, A., Pentti, J., 2005. Optimism and Pessimism as Predictors in Change in Health after Death or Onset of Severe Illness in Family. Health Psychology 24(4):413-421.

Landy, F. J., Conte, J. M., 2004. Work in the 21st Century. An Introduction to Industrial and Organizational Psychology. NY: McGraw-Hill.

Le Blanc, P., de Jonge, J., Schaufeli, J., 2000. Job Stress and Health. in Chmiel, N. (Ed.) Work and Organizational Psychology, pp. 394-396.

McCrae, R. R., Costa Jr , P. T., 1986. Personality, coping and coping effectiveness in an adult sample, Journal of Personality 54:385-405.

McManus, I.C., Keeling A., Paice E., 2004. Stress, burnout and doctors' attitudes to work are determined by personality and learning style: A twelve year longitudinal study of UK medical graduates. BMC Medicine 2:29.

Pitariu, H. D., Iliescu D., Tureanu V., Peleaşcă C., 2006. Inventarul de personalitate California, Editura Odyssea Bucureşti.

Selye, H., 1977. The Stress of Life. McGraw-Hill Co, New York.

Authors

•Voichita Dumitru, Department of Clinical Psychology, "Iuliu Haţieganu" University of Medicine and Pharmacy, Romania, Cluj-Napoca, 400012, 43rd Victor Babeş St., voichitadumitru@yahoo.com

•Doina Cozman, Department of Clinical Psychology, "Iuliu Haţieganu" University of Medicine and Pharmacy, Romania, Cluj-Napoca, 400012, 43rd Victor Babeş St., doina_octaviancosman@yahoo.com