

EVALUATION OF STRESS IN PROFESSIONAL LIFE AND OTHER FACTORS AMONG YOUNG TECHNOLOGY PROFESSIONALS IN SOUTH INDIA

Authors: Ramesh Bhat M¹, Pallavi Shet², Nayanatara AK³ and Ganaraja B^{4*}

¹Professor, Department of Physiology, Kasturba Medical College (Manipal University), Mangalore, India

²Assistant Professor, Physiology, KVG Medical College, Sullia, D.K., India

³Associate Professor, Department of Physiology, Kasturba Medical College (Manipal University), Mangalore, India

⁴Additional Professor, Department of Physiology, Kasturba Medical College (Manipal University), Mangalore, India.

*Corresponding author email: ganaraj.b@gmail.com Phone: +91 9449642150

ABSTRACT: Stress has been a topic of interest in the last century, since its description by Hans Selye. Stressors could be anything from the daily life, professional or domestic, eventually leading the deleterious health outcomes. However some types of stressors were believed to be necessary for growth, which were termed eustress. In the present study we evaluated the stress levels in software professionals (n=155) from Karnataka State, India by using Professional Life stress Score (PLSS) and Perceived Stress Score (PSS) after explaining the subjects about the questionnaire and response types and obtaining their informed consent. Ethical clearance was obtained from the institutional ethics committee before the beginning of the data collection. Apart from the responses for the questionnaire, their BMI was calculated by carefully measuring their height and weight. Their other demographic data such as age, matrimonial status were also collected. From the results we found that PLSS score was elevated to mild and moderate degree among the study group, which was not correlated with either their age or matrimonial status. However in contrast, the PSS scores were elevated to higher degree and it was well correlated with BMI, age and number of years of experience. From the results we found that these young technical professionals of Bangalore and Mangalore did not have much professional stress but they were influenced by other factors which produce overall stress as evidenced by the elevated PSS scores. Thus we herestate that this study produced results which was helpful in differentiating the professional life environment causing stress and other compounding factors influencing the psychological well being. We, therefore conclude that well employed young professional enjoy their work but other extraneous factors could lead to stress.

Key words: Professional life stress, Perceived stress score, Software professionals, BMI.

INTRODUCTION

The origin of stress in life is a matter of intense debate. Handling stress is the key for success and well being. Software industry has been a new area of employment in India post millennium, employing a number of young men and women. In India the software industry employees are in the age group of 25-35 years. Professional life involves several issues, such as task completion, competition, promotions and compensation package apart from the personal issues, which need a close watch. Often the hectic mental work and environmental reasons are stressful among this group of professionals. Stress in a limited sense is necessary for health and growth, this is termed eustress (Lazarus R 1972 - Lazarus, R. S. 1966, Hargrove, M. B et al, 2013), while it could be deleterious when it is severe, then it could be called distress. (Selye, Hans 1983, Howard, F. 2008) Eustress is thus related to self-efficacy. Self-efficacy is one's judgment of how they can carry out a required task, action or role. (Howard, F. 2008) Among the software professionals employed in Karnataka using the well validated professional life stress score (PLSS). (Fontana D. 1989)

Professional life stress is understated, but Yerkes-Dodson Curve aptly explains the importance of stress management. It suggests that optimal stress, which will result in maximum output, is necessary, but increased level could lead to fall in performance. (Fontana D. 1989). Research into concepts from the field of positive psychology such as work engagement, sense of coherence, self-efficacy, flow and resilience has begun to provide detailed understanding of workers' happiness, health and betterment. These findings provide possible directions for supervision interventions that go beyond traditional review of self-care and stress-management strategies and seek to extend the wellbeing of the supervisee. (. Howard FM. (2008). UK health and safety executive (HSE) has been analysing the work related stress in UK. (Robert Kerr et al, 2009, Colin J et al, 2004). They reported with the help of HSE management standards (MS) that work place stress to be positively associated with job satisfaction and negatively associated with 'job-related anxiety', 'jobrelated depression' and 'witnessed errors/near misses'. Occupational stress occurs when there is discrepancy between the demands of work place and an individual's ability to carry out the work and complete the demands (Ranjit L, Mahespriya L. 2012). Any kind of stress is known to increase the blood pressure up to a certain extent (Henry, O& Evans, A.J 2008, Douglas C et al, 2002). Software industry professionals reportedly showed higher levels of stress in earlier studies. (Harshfiled GA et al, 2002). This study reported over 50% of the respondents to be highly stressed among software employees, which was in agreement with other reports too. (Sivaraman G et al, 2011, Sharma AK et al, 2006). Reasons suggested for this are varied, from long work hours to night shift among other factors. Thong and Yap in their study opined that though pay structure is relatively higher compared with other sectors, the working conditions in the IT Profession is becoming more and more stressful. (Thong JY, Yap CS. (2000) Long-term exposure to job stress has been linked to an increased risk of musculoskeletal disorders and depression as well as syndromes such as burnout, and may contribute to a range of other debilitating diseases. Stressful working conditions also may interfere with an employee's ability to work safely, contributing to work injuries and illnesses. (Linda Seymour, 2005)

Therefore, we analysed the PLSS scores (Fontana D. 1989), of respondents among Information technology professionals to assess their status. In the same group, we carried out the general levels of stress by using PSS score (Cohen, S., Kamarck, T., and Mermelstein, R. 1983, Cohen, S. and Williamson, G. 1988). This study allowed us to differentiate between the stress due to profession on one hand and overall stress on the other hand. Careful interpretation of the results will allow us to analyse if the well being of the individual depends on profession per se or the compounding factors in life other than work place too were considered stressors.

MATERIALS AND METHODS

For this study, we recruited Software engineers working in various software companies across Karnataka. The study group included programmers, developers, and project managers working on full time basis. A total of 155 subject, 110 males and 45 females in the age group of 25 to 40 were included in this study. The group, irrespective of gender, were further subdivided in to age group of 20years -25 years (n=43); 26 years – 30 Years (n=58); and above 31 years (n=44). Further, the number of years of experience too was taken into consideration (less than 5 years; 5-10 years & more than 10 years of experience), based on this also the PLSS score was assessed.

Inclusion criteria:

1. Healthy subjects working in software professional for atleast 3 months.
2. Daily working of minimum 6hrs

Exclusion criteria:

1. History of major illness in the recent past
2. History of family distress in the recent past

Participants were explained the purpose, procedure and the confidentiality in advance and their written informed consent were obtained. Institutional ethical committee clearance was obtained before commencement of the study. A standardized questionnaire Professional Life Stress Score (Linda Seymour, 2005) was used to assess stress levels were handed over to each participant. This questionnaire for professional life stress score used By David Fontana Adapted from Managing Stress, The British Psychological Society and Routledge Ltd., 1989 to assess stress levels at work place were handed over to each participant. Participants' response was noted after explaining each question to them. For each question, score was marked. This tool is a 24 question list with options for representing the respondents' answers. Based on the response, people were categorised on different levels of stress using the key for computation as: Score = 0-15. Low Stress; Stress isn't a problem in your life. Score = 16-30, Moderate range of stress for a busy professional person.

It's nevertheless well worth looking at how it can reasonably be reduced. Score = 31-45, High Stress is clearly a problem, and the need for remedial action. Score = 45-60, Very high stress is a major problem, and something must be done without delay. Person may be nearing the stage of exhaustion in the general adaptability syndrome. Perceived Stress Score (PSS score) (Fontana D. 1989, Cohen, S., Kamarck, T., and Mermelstein, R. 1983) was also assessed in the same group. This tool consists of 10 item self-report questionnaire, for which the respondents will give ratings from 0 to 4, with the help of key, the total of scores were computed and the individual's stress levels were assessed as: Low stress: Scores ranging from 0-13. Moderate stress: Scores ranging from 14-26. High perceived stress: Scores ranging from 27-40. Anthropometric data of the study group was also collected and tabulated. Their body mass index (BMI) was calculated. The PLSS and PSS responses were determined and compared and correlated to their BMI, age, work experience, matrimonial status represented here.

Statistical analysis:

This is a cross sectional study. The data collected was entered in SPSS software and analyzed by Pearson's chi square test, correlation coefficient & descriptive analysis. p value less than 0.05 was considered significant.

RESULTS

Analysis of PLSS score among the study group revealed, 132(85%) of them showed mild stress and 15% exhibited Moderate degree of Stress. There were none in this study group who showed high or very high scores of PLSS (Table 1). PLSS scores in majority of respondents was in lower range (mild, n=132) in all categories of BMI. In the same group, the Perceived Stress Score was assessed and we found that more number of respondents showed higher stress levels. 70% of persons with normal BMI showed moderate stress, while incidence was 75% among overweight respondents (Table 2). When the PSS and PLSS scores were computed and correlated to the age and Gender, we found that the PSS showed elevated scores in higher age group ($p < 0.01$), while PLSS showed no significant rise. There was no significant variation of scores among the Genders. (Table 3).

Table 1: PLSS scores among the study group (overall) and PLSS levels in different category based on BMI. Values = Mean \pm SD (Mild vs moderate PLSS scores ** = $p < 0.001$)

BMI	Professional life stress scale(PLSS)			
	Mild 132 (85%)	Moderate 23(15%)	High	Very high
Total 155				
PLSS in underweight	12.25 \pm 1.26 n= 4 (3%)	19 \pm 1.73** n= 3(13%)	Nil	Nil
PLSS in normal	8.32 \pm 3.35 n= 103(78%)	20.25 \pm 2.55** n= 8(35%)	Nil	Nil
PLSS in overweight	8.43 \pm 3.35 n= 16(12%)	17.25 \pm 2.52** n= 8(35%)	Nil	Nil
PLSS in obese	9.11 \pm 4.70 n= 9(7%)	20.5 \pm 2.23** n= 4(17%)	Nil	Nil

Table 2: PSS score among the study group, Under-weight, Normal, Overweight and Obese subjects (Total n= 155), Values = Mean \pm SD

BMI	PSS score Group mean \pm SD	Perceived Stress Scale		
		Mild	Moderate	High
Underweight (n=7)	21 \pm 3.92	(0)	19.67 \pm 1.86 (n=6, 85%)	29 (n=1, 15%)
NORMAL (n=111)	16.01 \pm 4.70	10.73 \pm 2.61 (n=30, 27%)	17.55 \pm 3.10** (n=78, 70%)	28.67 \pm 0.58** $\dagger\dagger$ (n=3, 3%)
Overweight (n=24)	19.58 \pm 5.01*	11.50 \pm 1.73 (n=4, 17%)	20.55 \pm 3.26 (n=18, 75%)	27 \pm 0 (n=2, 8%)
OBESE (n=13)	16.77 \pm 9.30	6.5 \pm 0.58 (n=4, 30%)	15.2 \pm 0.45 (n=5, 40%)	29 \pm 1.16 (n=4, 30%)

PSS score: * Normal vs Overweight: $p < 0.05$; **mild v/s moderate- $p < 0.001$; $\dagger\dagger$ Moderate Vs High: $p < 0.001$.

Table 3: PSS and PLSS Stress Level With Age Groups & Gender. (n=155)

STRESS SCORE	AGE(yrs)			GENDER	
	20-25	26-30	> 30	MALE	FEMALE
PSS	16.721±5.7	15.63±4.1	18.86±5.91	16.9±5.8	16.6±5.04
p value	0.01**			0.737ns)	
PLSS	10.53±3.83	9.8±4.48	10.05±4.87	10.2±4.87	9.7±5.39
p value	0.76(ns)			0.635(ns)	

** Highly significant, ns-not significant.

From the data, matrimonial status did not show any elevated stress levels in PSS score and PLSS showed slightly elevated stress in unmarried respondents (Table 4). Increased stress levels was observed in PSS analysis progressively as the number years of work experience, but their PLSS did not show signs of elevated stress. (Table 5).

Table 4: PSS and PLSS Levels With Marital Status (n=155)

Stress Score		Single	Married
PSS Score	Mild	18 (25.4%)	20 (23.8%)
	Moderate	49 (69%)	58 (69%)
	High	4 (5.6%)	6 (7.1%)
P Value		0.917(ns)	
PLSS Score	Mild	66 (93%)	66 (78.6%)
	Moderate	5 (7%)	18 (21.4%)
P Value		0.01 *	

Table 5: PSS and PLSS scores and Work experience

Stress Score	Work Experience(yrs)		
	0-5	6-10	>11
PSS	16.42±5.3	15.69±4.5	20±5.91
P value	0.001***		
PLSS	10.25±4.47	9.17±4.13	11.14±7.27
P value	0.23		

***very highly significant

DISCUSSION

From the present study on the analysis of PLSS score and PSS scores in the same group of respondents, we were able to reveal an interesting fact that even though stress was elevated, it need not always be due to the profession. We found elevated PSS scores suggesting an increased stress levels. But PLSS scores were not elevated in the same line. There were no cases of high or very high scores in PLSS at all among all the 155 respondents. PLSS scores showed no correlation to BMI, while PSS scores were high among overweight and obese respondents. Gender and Matrimonial status did not show any correlation in this study. But PSS scores were elevated in increased age and number of years of service in the industry. Overall it appears; our study group had a good mental comfort level. Eustress was conducive to health and growth (Howard, F. 2008). When factors in our environment cause deleterious effects which are believed to be beyond our control, then distress may ensue (Selye, Hans 1983). Most people believe the major contributor to stress is the professional life (M. S. Darshan et al, 2013). Health and safety executive, UK had been carrying out a series of research on typical stressors the professional life by a range of commentators. (The HSE) (Rick, J et al, 2002). More specific stress theories such as burnout; (Maslach, C et al, 2001) job demand – job control (Karasek, R.A. 1979), effort-reward imbalance (Siegrist, J. 1998), violation of the psychological contract (Rousseau, D.M. 1995), social status in hierarchy. (Smith, G.D et al, 1990). Therefore it is widely known that stress could originate from work place and job stress.

Previously published articles on Indian software professional suggested that over 50% were professionally stressed. (M. S. Darshan et al, 2013). They also argued that this lead to alcoholism and loss of performance. In our study, we found that there was an increased stress levels in PSS method, (PallaviShet et al, 2014) while, the PLSS in the same group did not show the trend. Our study differed from the available literature on the software industry workers based in Karnataka state, India. Stress could occur from several sources, and other compounding factors could be family issues, health concerns and even sundry affairs could be a factor. Since the software industry is an industry employing young tech graduates, paying decent compensation package, the workplace stress could be minimal in this study. Moreover we also have to take into consideration of the social factor of life style and comfort levels of the city which is chosen for study. Most of the respondents of this study were from Garden city, Bangalore and Mangalore, where the cosmopolitan nature of the cities give a good environment for living. The professional life stress also could vary from company to company, depending upon their respective service rules, working environment as well as compensation package. (Johnson JV, Lipscomb J. 2006). All these factors must be kept in mind in order to get the best output by the employees in the industry. This information also will be useful for the psychiatric counsellors and care givers of those who experience on job burnout.

However from the study of PLSS and PSS scores in the same group of subjects we could differentiate that the not all the stress originated from the work place. Other compounding factors play important role in the mental well being. Though this study has been conducted in a small group of subjects and limited area, it may differ from other studies. A larger group and multicentric study may reveal more information regarding the psychological well being of the individuals working in respective sectors of service.

CONCLUSION

In the present study, we elucidated the stress originated from the professional life by PLSS scores and over all life stress by PSS scores in the same group of subjects. It revealed that the stress originating from Professional life was lower and overall stress may be more. A balance of work place and overall environment contribute to stress and this must be kept in mind by the care givers, counsellors and the employers for the best output by the employees.

REFERENCES

- Anderson, C. R. (1976). "Coping behaviors as intervening mechanisms in the inverted-u stress-performance relationship". *Journal of Applied Psychology* 61(1): 30-34.
- Colin J. Mackay, Rosanna Cousins, Peter J. Kelly, Steve Lee And Ron H. McCain. (2004) 'Management Standards' and work-related stress in the UK: Policy background and science *Work & Stress*, April-June, VOL. 18, NO. 2, 91-112.
- Cohen, S., Kamarck, T., and Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 24, 386-396.
- Cohen, S. and Williamson, G. (1988). Perceived Stress in a Probability Sample of the United States. Spacapan, S. and Oskamp, S. (Eds.) *the Social Psychology of Health*. Newbury Park, CA: Sage,
- Darshan M. S., Rajesh Raman, T. S. Sathyanarayana Rao, Dushad Ram, BinduAnnigeri. (2013). A study on professional stress, depression and alcohol use among Indian IT professionals. *Indian Journal of Psychiatry* 55(1), 63-69.
- Douglas C, George DS, Martin JS. (2002) Blood pressure reaction to acute psychological stress and future Blood pressure status: A 10 Year old follow up of men in the Whitehall 2 study *psychosomatic medicine*; 63: 737-43.
- Fontana D. (1989). *Managing stress*. The British Psychological Society. Routledge Ltd. Leicester. England.
- Fontana D. (1989). Professional life stress scale adapted from *Managing stress*. The British Psychological Society and Routledge Ltd.
- Hargrove, M. B. Nelson, D. L.; Cooper, C. L. (2013). "Generating eustress by challenging employees: Helping people savour their work." *Organizational Dynamics* 42: 61-69.
- Harshfield GA, Treiber FA, Davis H, Kapuku GK. (2002). Impaired stress induced pressure natriuresis is related to left ventricular structure in blacks. *Hypertension*; 39: 844-7.
- Henry, O& Evans, A.J (2008) "Occupational stress in organizations" *journal of management research* 8(3): 123-135.
- Howard, F. (2008). "Managing stress or enhancing wellbeing? Positive psychology's contributions to clinical supervision." *Australian Psychologist* 43(2): 105-113.
- Johnson JV, Lipscomb J. (2006). Long working hours, occupational health and the changing nature of work organization. *Am J Ind Med*; 49(11):921-9.

- Karasek, R.A. (1979). Job Demands, Job Decision Latitude and Mental Strain: Implications for Job Redesign Administrative Science Quarterly 24 285-311.
- Lazarus R 1972 - Lazarus, R. S. (1966). Psychological Stress and the Coping Process. New York, Toronto, London: McGraw-Hill Book Co.
- Linda Seymour, (2005). "Workplace Interventions for People with Common Mental Health Problems", British Occupational Health Research Foundation.
- Maslach, C., Shaufeli, W.B. & Leiter, M.P. (2001). Job burnout Annual Review of Psychology, 52, 397-422.
- PallaviShet, Ramesh Bhat, Ganaraja B, Nayanatara AK, Sheila Pai. (2014). Evaluation of Stress and Its Correlation with Anthropometric Parameters among Software Industry Professionals, International Journal of Innovative Research in Science, Engineering and Technology, 3 (2); 9068-9072.
- Ranjit L, Mahespriya L. (2012). Study on job stress and quality of life of women software employees. Int J Res Soc Sci.;2:2
- Rick, J., Thomson, L., Briner, R.B., O'Regan, S. & Daniels, K. (2002). Review of existing scientific knowledge to underpin standards of good practice for key work-related stressors – Phase 1 Research Report 024 London: HSE
- Robert Kerr, Marie Mchugh and Mark McCrery. (2009). HSE Management Standards and stress-related work outcomes. Occupational Medicine; 59:574–579.
- Rousseau, D.M. (1995). Psychological Contracts in Organisations: Understanding Written and Unwritten Agreements. London: Sage
- Siegrist, J. (1998). Adverse health effects of effort-reward imbalance at work. In C.L. Cooper (ed), *Theories of Organisational Stress*. Oxford: Oxford University Press.
- Selye, Hans (1983). "The Stress Concept: Past, Present and Future". In Cooper, C. L. Stress Research Issues for the Eighties. New York, NY: John Wiley & Sons. Pp. 1–20.
- Sivaraman G, Mahalakshmy T, Kalaiselvan G. (2011). Occupation related health hazards: Online survey among software engineers of South India, Indian J Med Spec; 2: 77-8.
- Sharma AK, Khera S, Khandekar J. (2006). Computer related health problems among information technology professionals in Delhi. Indian J Community Med.31:36-8. Available from:<http://www.ijcm.org.in/text>.
- Smith, G.D., Shipley, M.J. & Rose, G. (1990). Magnitude and causes of socio-economic differentials in mortality: further evidence from the Whitehall Study. Journal of Epidemiology and Community Health, 44, 265-270
- Thong JY, Yap CS. (2000). Information systems and occupational stress: A theoretical framework. Omega.28 (6); 681–92.