

DEVELOPMENT OF A TOOL TO MEASURE STRESS AMONG UNIVERSITY AND COLLEGE TEACHERS

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Stress is a complex, multivariate process. Its process is dynamic, and constantly changing. Lazarus (1990) stated that psychological stress results from the interplay of system variables and processes and it depends on an appraisal by the person that the person-environment relationship at any given moment is one of harm, threat, or challenge. Stress is subjective in nature, rather than an objective phenomenon. It is essential to assess each important facet of the stress process which includes the environmental and personal *antecedents*, the *intervening* processes and indicators of the *stress response* and *consequences* of stress for individuals at the workplace.

University teaching has traditionally been regarded as a low stress occupation (Fisher, 1994). During recent years Indian universities have been subjected to many psycho-social, academic and organizational changes. Liberalization, privatization, self-financing, contractual teacher system, crisis in government funds, ever changing career advancement scheme, thrust on research etc. have led to an alarming increase in the occupational stress experienced by university and college teachers. Increase in work load, student and teacher politics, frequent changes in policies related to admission, grants, scholarships, incentives, courses and evaluation system have worsened the situation. The requirements to publish and participate in seminars and workshops have created ethical problems. Boyd and Wylie (1994) reported that increasing workloads and work-related stress resulted in less academic time spent on research, publishing and professional development, decreasing teaching and research standards and increasing interpersonal conflict in academic staff relationships. They further report that stress negatively affected physical and emotional health, family relationships and leisure activities. Armour, CaVarella, Fuhrmann, and Wergin (1987) reported that stress among academic and general staff of universities significantly affects the quality of both teaching and research, and results in feelings of detachment, low job satisfaction and low job commitment, which may be contagious for students and colleagues. They conclude that the consequences of academic stress may be far more wide ranging than the occasional stress illness.

Research in the area

Occupation and industry-specific stress scales are more reliable and valid predictors of stress and its effects than general occupational stress scales. Gmelch

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et al. (1986) designed a specific university stress survey for use with US university staff. The need to provide insight into sources of stress experienced by university and college teachers motivated the author to develop the tool to measure sources of stress i.e. stressors among university and college teachers.

Gillespie *et al* (2001) conducted a study on a sample of 178 academic and general staff from 15 Australian universities. The groups focussed on understanding staff's experience of occupational stress, perceptions of the sources, consequences and moderators of stress. Both general and academic staff reported a dramatic increase in stress during the previous five years. As a group, academic staff reported higher levels of stress than general staff. Five major sources of stress were identified including insufficient funding and resources; work overload; poor management practice; job insecurity; and insufficient recognition and reward. The majority of groups reported that job-related stress was having a deleterious impact on their professional work and personal welfare. Aspects of the work environment (support from co-workers and management, recognition and achievement, high morale, working conditions), and personal coping strategies (stress management techniques, work/non-work balance, tight role boundaries and lowering standards) were reported to help staff to cope with stress. Teachers working in higher educational institutions have the prime duty in the creation and development of knowledge and innovation in addition to imparting education. High levels of occupational stress if left unchecked and unmanaged may undermine the quality, productivity and creativity of employees' work, in addition to employees' health, well-being, and morale (Calabrese, Kling, and Gold, 1987; Everly, 1990; Matteson, and Ivancevich, 1987; Nowack, 1989; Osipow, and Spokane, 1991; Terry, Tonge, and Callan, 1995). Seldin (1987) stated that the academic environment of the 1980s had imposed surprisingly high levels of job stress on academics, and that the level of stress would continue to increase in future decades. Boyd and Wylie (1994) found that half of the academics in their sample of academics 'often or almost always' found their work to be stressful, and 80% believed that their workload had increased and become more stressful in recent years. In addition, 46% expected further increase in workload in the future. Sharpley, Reynolds, Acosta, and Dua (1996) reported that stress was a major problem for about 25% of staff, with these staff reporting higher levels of anxiety, days absent, doctors' visits, injuries, accidents and illnesses, and lower self-reported physical health.

Construction of items and item analysis

After going through the stressors experienced by teachers working in universities and taking self experiences into consideration, the author decided to

construct an inventory to measure stress experienced in the areas of admission, examination, student quality, research, academic support, inter-personal relations, ethics, professional growth, family attitude and economic factors. For each of the ten areas of stress ten items could be prepared. Teachers were requested to tell the frequency of their exposure to stress inducing situations during a period of last one year. The response alternatives were: "never, seldom, sometimes, many times and often".

The try-out form thus prepared was administered on a sample of 79 teachers working in university and colleges. A score of 0, 1, 2, 3 and 4 were assigned for the five responses namely never, seldom, sometimes, many times and often respectively. Scores on items belonging to each of the ten areas of stress were added separately to find "Area" scores for ten areas of stress.

Table 1 : Correlations between scores on various items and stress area

Item no. try-out form	Item no. final form	ADMI	EXAM	STUD	RESE	ACAD	INTE	PROF	ETHI	FAMI	ECON	CHI
1	1	.304**	-.293**	-.147	.049	-.239*	-.067	-.409**	-.303**	-.076	-.246*	14.86**
2	1	.496**	.451**	.256*	.318*	.430**	.365**	.436**	.429**	.300**	.236*	36.13**
3		.421**	-.087	.249*	-.002	.234*	-.183	-.181	-.178	.100	.078	2.31
4		.222	.152	.119	-.147	-.075	.145	.133	.067	.046	-.245*	33.22**
5	11	.596**	.173	.045	.349**	.113	-.139	-.144	.125	-.304**	.027	21.57**
6		.697**	.503**	.220	.243	.288*	.067	.089	.371**	-.089	.166	7.77
7	21	.474**	.475**	.118	.378**	.068	.006	-.098	.250*	.194	.331**	41.44**
8	31	.436**	.587**	.324**	.333**	.251*	.077	.257*	.409**	.048	.352**	18.28**
9	41	.658**	.395**	.303**	.565**	.411**	.022	.180	.187	.124	.575**	20.68**
10		.624**	.318**	.092	.412**	.245*	-.017	.036	.188	-.068	.303**	8.79
11		.567**	.576**	.319**	.449**	.439**	.068	.302**	.525**	-.053	.150	8.53
12		.289*	.487**	-.062	.267*	.013	.111	.017	.163	.020	-.114	18.79**
13	2	.404**	.628**	.178	.239	.162	.205	.386**	.302**	.102	.188	23.09**
14		.225*	.453**	.161	.457**	.134	.091	.122	-.019	.345**	.169	33.34**
15	12	.348**	.669**	.132	.402**	.218	.398**	.459**	.438**	.418**	.419**	10.18*
16	22	.299**	.584**	.064	.096	-.144	.028	.034	.173	-.122	-.002	9.80*
17		.488**	.713**	.382**	.292*	.420**	.135	.148	.395**	.269*	.270*	8.91
18	32	.289*	.708**	.367**	.272*	.300**	.028	.289**	.392**	.158	.342**	11.19*
19		.192	.637**	.484**	.174	.232*	-.098	.168	.220	.130	.198	3.72
20	42	.036	.585**	.335**	.083	.270*	.247*	.423**	.295**	.477**	.303**	23.22**
21		.300**	.454**	.569**	.062	.396**	-.044	.279*	.272*	-.093	.191	8.79
22	3	.092	.135	.533**	.140	.273*	-.243*	-.047	-.015	.066	.007	20.81**
23		.180	.402**	.149	.359**	.238*	.308**	.306**	.376**	.272*	.181	15.22**
24		.039	-.242*	.231*	.117	.032	-.458**	-.485**	-.534**	-.035	.038	37.27**
25	13	.281*	.173	.591**	-.068	.309**	-.061	.028	-.111	.235*	.194	20.68**

1	1	.304**	-.283**	-.147	.049	-.239*	-.067	-.409**	-.303**	-.076	-.246*	14.88**
2	1	.486**	.451**	.256*	.318*	.430**	.365**	.436**	.429**	.300**	.236*	38.13**
3		.421**	-.087	.249*	-.002	.234*	-.183	-.181	-.178	.100	.078	2.31
4		.222	.152	.119	-.147	-.075	.145	.133	.067	.046	-.245*	33.22**
5	11	.596**	.173	.045	.349**	.113	-.139	-.144	.125	-.304**	.027	21.57**
6		.697**	.503**	.220	.243	.288*	.067	.089	.371**	-.089	.168	7.77
7	21	.474**	.475**	.118	.378**	.068	.006	-.098	.250*	.194	.331**	41.44**
8	31	.436**	.587**	.324**	.333**	.251*	.077	.257*	.409**	.048	.352**	18.28**
9	41	.658**	.395**	.303**	.565**	.411**	.022	.180	.187	.124	.575**	20.68**
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11		.567**	.576**	.319**	.449**	.439**	.068	.302**	.525**	-.053	.150	8.53
12		.289*	.487**	-.062	.267*	.013	.111	.017	.163	.020	-.114	18.79**
13	2	.404**	.628**	.178	.239	.162	.205	.386**	.302**	.102	.188	23.09**
14		.225*	.453**	.161	.457**	.134	.091	.122	-.019	.345**	.169	33.34**
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16	22	.299**	.584**	.064	.096	-.144	.028	.034	.173	-.122	-.002	9.80*
17		.488**	.713**	.382**	.292*	.420**	.135	.148	.395**	.269*	.270*	8.91
18	32	.289*	.708**	.367**	.272*	.300**	.028	.289**	.392**	.158	.342**	11.19*
19		.192	.637**	.484**	.174	.232*	-.098	.168	.220	.130	.198	3.72
20	42	.036	.585**	.335**	.083	.270*	.247*	.423**	.295**	.477**	.303**	23.22**
21		.300**	.454**	.569**	.062	.396**	-.044	.279*	.272*	-.093	.191	8.79
22	3	.092	.135	.533**	.140	.273*	-.243*	-.047	-.015	.066	.007	20.81**
23		.180	.402**	.149	.359**	.238*	.308**	.306**	.376**	.272*	.181	15.22**
24		.039	-.242*	.231*	.117	.032	-.458**	-.485**	-.534**	-.035	.038	37.27**
25	13	.281*	.173	.591**	-.068	.309**	-.061	.028	-.111	.235*	.194	20.68**
26		.080	.055	.321**	-.128	.287*	-.141	-.022	-.111	.096	.141	52.96**
27		.201	.193	.312**	.103	.252*	-.089	-.030	.040	.092	-.162	21.44**
28	23	.223*	.243*	.467**	.015	.376**	.241*	.449**	.504**	.147	.365**	16.13**
29	33	.043	.146	.415**	-.156	.228*	-.104	.054	-.034	.199	-.131	36.38**
30	43	.107	.248*	.680**	.128	.284*	.030	.011	.046	.159	.131	39.41**
31	4	.288*	.341**	.097	.548**	.201	-.161	.054	.016	.034	.356**	13.60**
32	14	.359**	.521**	.129	.681**	.342**	-.057	.129	.334**	-.014	.276*	9.54*
33	24	.29**	.290**	.397**	.515**	.541**	-.341**	-.094	-.052	.257**	.108	33.98**
34		.297**	.337**	.274*	.409**	.368**	-.011	.151	.176	.023	-.022	28.91**
35		.190	.393**	.098	.264*	.229*	.283*	.409**	.495**	.006	.297**	29.80**
36	34	.251*	.454**	.005	.658**	.339**	.338**	.384**	.48**	.184	.268*	31.32**
37	44	.278*	.260*	.034	.478**	.167	-.165	.011	.326**	-.148	.261*	
38		.288*	.149	.061	.409**	.139	-.046	-.052	.074	-.039	.242*	15.14**
39		.502**	.282*	.244*	.533**	.375**	.071	.019	.148	.308**	.508**	81.44**
40		.128	.190	-.045	.177	.056	-.021	.075	-.074	.324**	.253*	42.08**
41		.003	.012	.314**	.066	.208	-.174	.005	-.174	.044	.222*	34.35**
42		.252*	.151	.306**	.224	.624**	.156	.133	.260*	.197	.102	14.14**
43	5	.34**	.287*	.322**	.465**	.454**	-.236*	-.069	.001	.255*	.043	29.92**
44	15	.33**	.322**	.453**	.507**	.580**	-.318**	-.116	.060	.157	.091	12.84*
45	25	.123	.202	.259*	.191	.531**	.205	.192	.269*	.152	.140	12.84*
46	35	.156	.254*	.192	.159	.602**	.358**	.381**	.485**	.281*	.088	23.47**
47		.36**	.316**	.336**	.001	.327**	.037	.116	.163	.029	-.293**	36.51**
48	45	.28*	.048	.293**	.297*	.465**	-.109	-.036	-.046	.131	.019	13.34**
49		-.175	-.026	-.008	.153	.314**	.306**	.426**	.288*	.173	.268*	23.98**
50		-.132	-.025	.028	-.093	.246*	.500**	.422**	.363**	.170	.280*	16.13**
51	6	.215	.272	-.119	.201	.163	.673**	.433**	.620**	.269	.334**	25.11**

52		.217	-.047	-.190	.088	-.120	.280	.042	.020	.040	.054	2.71
53	16	-.111	-.068	-.103	-.013	.124	.785**	.502**	.412**	.365**	.124	11.89
54	26	.041	.218	.011	.024	.248	.645**	.487**	.318**	.696**	.221	38.91**
55		.015	.144	-.065	-.123	.105	.533**	.407**	.437**	.258	.047	52.33**
56		.010	.218	-.107	-.046	.063	.643**	.461**	.511**	.213	.394**	2.17
57	36	.051	.076	-.044	.009	.050	.743**	.450**	.378**	.370**	.167	45.75**
58	46	-.101	.178	-.065	-.146	.057	.703**	.497**	.415**	.286	.269	19.42**
59		-.242	-.061	-.066	-.089	.067	.642**	.414**	.214	.425**	.174	19.04**
60		.231	.289**	.260	.013	.376**	.219	.399**	.303**	.172	-.115	26.25**
61	7	.182	.318**	.074	.153	.303**	.418**	.568**	.439**	.339**	.573**	18.79**
62		-.083	.206	-.069	.071	.199	.455**	.524**	.497**	.298**	-.010	32.33**
63	17	-.033	.130	-.078	.053	.212	.643**	.696**	.365**	.401**	.241	41.32**
64	27	-.094	.137	-.049	.060	.057	.373**	.676**	.316**	.147	.450**	28.80**
65	37	-.026	.157	-.061	-.087	.279	.473**	.742**	.558**	.112	.281	18.03**
66		.162	.348**	.139	.072	.248	.635**	.781**	.520**	.394**	.535**	8.03
67	47	-.021	.333**	.030	-.072	.061	.388**	.661**	.386**	.254	.399**	18.87**
68		.101	.191	.258	.033	.257	.302**	.487**	.366**	.179	-.030	55.37**
69		.144	.253	.250	.020	.134	.278	.497**	.236	.204	-.002	41.44**
70		-.012	.277	.054	.198	.211	.087	.347**	.256	.148	.016	31.06**
71	8	.195	.232	-.177	.350**	.257	.329**	.375**	.660**	.199	.237	14.48**
72	18	.307**	.427**	-.113	.427**	.158	.323**	.376**	.594**	.103	.296**	20.81**
73		.318**	.260	.178	.230	.201	.249	.266	.572**	.023	.418**	33.09**
74	28	.290	.457**	.272	.214	.351**	.472**	.518**	.628**	.516**	.425**	24.61**
75		.220	.247	.118	.197	.209	.102	.255	.419**	-.086	-.015	28.03**

**/* significant at .01/.05 level

Product moment coefficients of correlation were computed to find out whether items belonging to each area measure stress in the area. It was hypothesized that item-total (for specific area) correlation for each item belonging to the area will be higher than that for other areas. Table 1 shows these correlations. Chi squares were also computed and their significance was tested at .05 level. An overview of the table shows that five items were selected for each dimension. All items belonging to each area of stress have significant correlations for the relevant area and chi-square value for the items are also significant.

Reliability and Validity

Split half reliability for the Scale was calculated for a sample of university and college teachers (N=48). It is .948. The value of alpha coefficient is .922.

For finding the validity efforts have been made to find correlation between total stress score and stress scores for each of the ten areas. The results are given in table 2. All correlations are significant at .01 level. This shows that stress in various areas are positively related to total stress. It points to the validity of the scale.

Table 2 : Correlations between total stress score and stress scores for ten areas

S.No.	Areas	total stress
1	admission	.745**
2	examination	.541**
3	student quality	.703**
4	research	.784**
5	academic support	.619**
6	interpersonal relations	.717**
7	ethics	.778**
8	professional growth	.801**
9	family attitude	.637**
10	economic factors	.685**

** Significant at the 0.01 level

Table 3 : Correlations among stress in various areas of stress

	admission	examination	student quality	research	academic support	interpersonal relations	ethics	professional growth	family attitude
admission									
examination	.556**								
student quality	.392**	.319							
research	.542**	.298	.598**						
academic support	.460**	.214	.424**	.558**					
interpersonal relations	.440**	.238	.432**	.454**	.467**				
ethics	.518**	.649**	.516**	.490**	.427**	.606**			
professional growth	.547**	.398**	.559**	.678**	.464**	.386**	.552**		
family attitude	.279	.230	.343	.421**	.147	.484**	.399**	.540**	
economic factors	.498**	.117	.356	.424**	.205	.507**	.426**	.464**	.604**

** Significant at .01 level

Correlations among stress related to various areas have also been calculated. They have been given in table 3. Ten out of 45 correlations are not significant at .05 level. This also shows that stress in majority of the areas is positively correlated.

Norms:

Percentile norms for various areas of stress and total stress as well as descriptives have been shown in table 4 and 5 respectively.

Table 4 : Descriptives for the stress scale

Areas of Stress	Descriptives	Values	Areas of Stress	Descriptives	Values
admission	Mean	7.8542	interpersonal relations	Mean	6.4792
	Median	7.0000		Median	6.0000
	Std. Deviation	3.88664		Variance	16.680
	Skewness	.251		Std. Deviation	4.08417
	Kurtosis	-.567		Skewness	.712
examination	Mean	6.0833		Kurtosis	1.270
	Median	6.0000		Median	3.0000
	Std. Deviation	3.31235		Std. Deviation	3.34530
	Skewness	1.056		Skewness	1.259
	Kurtosis	1.629		Kurtosis	1.302
student quality	Mean	10.2708	professional growth	Mean	7.0000
	Median	9.0000		Median	6.5000
	Std. Deviation	3.95044		Std. Deviation	4.40503
	Skewness	.782		Skewness	.574
	Kurtosis	.005		Kurtosis	-.004
research	Mean	8.7708	family attitude	Mean	2.5417
	Median	9.0000		Median	1.0000
	Std. Deviation	4.13207		Std. Deviation	3.40812
	Skewness	.357		Skewness	1.744
	Kurtosis	.245		Kurtosis	2.797
academic support	Mean	7.9375	economic factors	Mean	7.3750
	Median	8.0000		Median	7.0000
	Std. Deviation	3.81713		Std. Deviation	5.24557
	Skewness	.299		Skewness	.341
	Kurtosis	-.018		Kurtosis	-.771
total stress	Mean	68.7917			
	Median	62.5000			
	Std. Deviation	27.88728			
	Skewness	.682			
	Kurtosis	.206			

Table 5 : Percentiles for the Stress Scale for University and College Teachers

S.No.	Area of stress	Percentiles						
		5	10	25	50	75	90	95
1	admission	1.45	3	5	7	11	14	15
2	examination	1.45	2	4	6	7	11	13
3	student quality	5	6	7	9	13.75	15	19.55
4	research	2	2.9	6	9	11	13.2	18
5	academic support	2	3.8	5	8	10	13.	14.65
6	interpersonal relations	0	.9	4	6	8.75	12.1	13
7	ethics	.45	1	2.	3	5.75	9.20	12.65
8	professional growth	.45	2	3	6.5	10	13	16.1
9	family attitude	0	0	0	1	4	8	11.55
10	economic factors	0	1	2	7	11.75	15.1	17.1
11	total stress	25.25	36	51	62.5	83.75	115.6	124.55

References :

- Armour, R. A., Caffarella, R. S., Fuhrmann, B. S., & Wergin, J. F. (1987). Academic burnout: Faculty responsibility and institutional climate. In P. Seldin (Ed.), *Coping with Faculty Stress* San Francisco, CA: Jossey-Bass.
- Boyd, S., & Wylie, C. (1994). *Workload and Stress in New Zealand Universities*. Wellington: New Zealand Council for Educational Research and the Association of University Staff of New Zealand.
- Calabrese, J., Kling, M., & Gold, P. (1987). Alterations in immune-competence during stress, bereavement, and depression. *American Journal of Psychiatry*, 144, 1123-1134.
- Costa, P. T., & McCrae, R. R. (1992). *NEO PI-R (Professional Manual)*. Odessa, Florida: Psychological Assessment Resources.
- Everly, G. S. (1990). *A Clinical Guide to the Treatment of the Human Stress Response*. New York: Plenum Press.
- Fisher, S. (1994). *Stress in Academic Life: The Mental Assembly Line*. Buckingham: Open University Press.
- Gillespie, N.A., Walsh, M., Winefield, A.H., Dua, J. & Stough, C. (2011). Occupational stress in universities: Staff perceptions of the causes, consequences and moderators of stress. *Work & Stress: An International Journal of Work, Health & Organisations*, 15(1), 53-72.
- Gmelch, W. H., Wilke, P. K., & Lovrich, N. P. (1986). Dimensions of stress among university faculty: Factor-analytic results from a national study. *Research-in-Higher-Education*, 24, 266 - 286.
- Lazarus, R. S. (1990). Theory-based stress measurement. *Psychological Inquiry*, 1 (1), 3 - 13.
- Lazarus, R. S., & Folkman, S. (1984). *Stress, Appraisal and Coping*. New York: Springer.
- Matteson, M. T., & Ivancevich, J. M. (1987). *Controlling Work Stress: Effective Human Resource and Management Strategies*. San Francisco, CA: Jossey Bass.
- Nowack, K. M. (1989). Coping style, cognitive hardiness, and health status. *Journal of Behavioural Medicine*, 12, 145 - 158.

- Osipow, S. H., & Spokane, A. R. (1991). *Occupational Stress Inventory: Manual (Research Version)*. Odessa, Florida: Psychological Assessment Resources.
- Seldin, P. (1987). Research findings on causes of academic stress. In P. Seldin (Ed.), *Coping with Faculty Stress* (pp. 13-24). San Francisco, CA: Jossey-Bass.
- Sharpley, C. F., Reynolds, R., Acosta, A., & Dua, J. K. (1996). The presence, nature and effects of job stress on physical and psychological health at a large Australian University. *Journal of Educational Administration*, 34, 73 - 86.
- Terry, D. J., Tonge, L., & Callan, V. J. (1995). Employee adjustment to stress: The role of coping resources, situational factors, and coping responses. *Anxiety, Stress and Coping*, 8, 1 - 24.