A Study on Identifying the various key Factors Predicting Occupational Stress Among Faculty Members Working in Selective Self-Financing Engineering Colleges

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Abstract

A survey was conducted among faculty members working in selective Self-Financing Engineering Colleges on various key factors predicting occupational stress. For conducting the study, researcher developed a survey instrument relating to occupational stress. The samples were collected from faculty members working in self-financing institutions located in seven districts namely, Trichy, Thanjavur, Thiruvarur, Nagapattinam, Cuddalore, perambalur and Pudukkottai. SPSS amos software was used to identify the various factors predicting occupational stress. The researcher then could identify five different group of variables which were named according to the similarity of the variables in each group. They are; Physiological symptoms of stress, Inadequate facilities and poor administration, Poor interpersonal relationship, Unexpected work situations, Increased workload. Then all the factors were statistically measured to ensure that there is a significant relationship among all factors through CFA.

Key Words

Occupational Stress, Faculty Members, Self-financing Engg. Colleges

Introduction

Across the nation, one out of every five full-time teachers leave the teaching profession to pursue a career outside the education field (National Center for Education Statistics, 1998). According to Oliver and Venter (2003), stress is an occurrence that must be recognized and addressed in various professions - the teaching profession is no exception. Educators worldwide are also experiencing expanding levels of stress (Kyriacou 2001). Former Deputy Chancellor of University of Technology Malaysia, Tan Sri Ainuddin

Wahid indicated that teachers' obligation is heavy, which every teacher plays an important role in the development of attitude and personality of our future generation other than delivering knowledge and become a role model to their students all the time (Yaacob 1985). According to Faridah Karim dan Zubaidah Aman (1998), teaching is attributed as an occupation that always disclosed to high stress level. Here the researcher intends to identify the various key factors predicting occupational stress among Self-Financing Engineering Colleges.

Review of Literatures

Gmelch (1993) reported that an increase in stress is not necessarily bad. He believed that stress is necessary to exist but must remain at the appropriate level. Because of this, successful people are those who convert their stress into creative energy and creative power (Krüger 1993). A few people think of stress as a pleasant experience. However, research data has mostly supported negative stress (Distress). Walter Gmelch in his book coping with Faculty Stress (1993) noted the negative impact that stress can have on faculty performance. Not only is stress costly to faculty members but it is also costly to their institutions (Allcorn and Diamond 1997). Workplace stress is related to stress-related illnesses that reduce productivity (Allerton 2000). Absenteeism, turnover and health-related problems resulting from work-related stress have impacted productivity negatively.

Valerie Wilson (2002) of the Scottish Council for Research in Education overviewed the literature on teacher's stress and stated "It is now generally accepted that stress is a multidimensional and multi-level phenomenon which is influenced by personal, situational or structural factors". Research has also established that high levels of occupational stress result in substantial costs to organizations and the community through health care expenses, compensation payments, lost productivity and turnover. Teachers' task in this context is not only tied to teaching, educating, and guiding. In fact, teachers are required to equip themselves with various qualities, knowledge, and skills so that they can become ascetic model that should have ideal mannerism, become a role model to students,

never make a mistake, and also manage to give an effective teaching (Peter Songan dan Narawi 2002).

Attridge (2000) found in his study that job stress affected teacher health, job performance and mental health. He also found that teachers' job stressors affected their students' achievement. Negative interpersonal relations and the absence of support from colleagues or superiors have been identified as significant stressors for employees. Stress often causes teachers to lower their level of time and energy in performing their teaching responsibilities. Stress and stress-related outcomes do have serious consequences on an individual's personal, mental, psychological and physical health (Durosaro 1995). These high levels of perceived work stress often result in a number of adverse individual and organizational responses, such as increased levels of depression, cardiovascular and gastrointestinal diseases, absenteeism, turnover intent and decreased job performance.

Methodology

To conduct a study among the faculty members working in self-financing Engineering colleges, researcher developed a survey instrument consisting of twenty-one variables relating to occupational stress that includes various aspects of their stressors. The researcher has used Descriptive Research Design for conducting the study. Further D**isproportionate Random Sampling Method** was employed to obtain a representative sample and data for the study was collected by means of a questionnaire. Out of the total population of 2065 faculty members, around four hundred and twenty-two samples were collected from twenty-eight colleges located in seven districts through the survey instrument. Data collected for the study was entered into SPSS amos software for identifying the various key factors predicting Occupational Stress. Then the researcher named each group according to the similarities of variables.

Analysis and Interpretations

1. FACTOR ANALYSIS

Factor Analysis Executed for Stress index domain

Table 1.1 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.898
Bartlett's Test of Sphericity	Approx. Chi-Square	2941.003
	df	300
	Sig.	.000

Bartlett's test of sphericity indicates whether the correlation matrix is an identity matrix, which would indicate that the variables are unrelated. The significance level gives the result of the test. Very small values (less than .05) indicate that there are probably significant relationships among the variables. A value higher than about .10 indicates that this data is not suitable for factor analysis. Hence, the researcher concludes the data is suitable for factor analysis.

Table 1.2 Communalities

	Initial	**Extraction**
SI1Hea	.499	.554
SI2Swe	.524	.573
SI3Tir	.430	.495
SI4Gri	.349	.331
SI5Thr	.450	.503
SI6Hum	.459	.503
SI7Har	.461	.509
SI10Co	.264	.258
SI11In	.204	.247
SI12Te	.270	.292
SI13Ex	.252	.218
SI14Ca	.241	.228
SI15La	.280	.392

SI16Wo	.321	.496
SI17La	.207	.196
SI18Ti	.244	.239
SI19Fa	.322	.362
SI20As	.320	.358
SI21Un	.453	.546
SI23Be	.227	.242
SI24Du	.293	.295
SI25Re	.339	.369
SI26Ma	.268	.325
SI27Co	.297	.342
SI28Re	.414	.468

Extraction Method: Principal Axis Factoring.

Communalities indicate the amount of variance in each variable that is accounted for. Initial communalities are estimates of the variance in each variable accounted for by all components or factors. These values are the proportion (for correlation analyses) or the amount (for covariance analyses) of variance accounted for in each variable by the rest of the variables.

Table 1.3 Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	6.658	26.631	26.631	6.060	24.239	24.239	4.666
2	2.319	9.275	35.907	1.763	7.053	31.292	4.202
3	1.218	4.874	40.780	.636	2.545	33.837	3.692
4	1.166	4.664	45.444	.483	1.931	35.768	2.648
5	1.033	4.133	49.577	.401	1.605	37.373	1.951
6	.994	3.976	53.553				
7	.962	3.850	57.403				
8	.910	3.639	61.042				
9	.854	3.415	64.457				
10	.794	3.177	67.634				
11	.748	2.990	70.624				
12	.738	2.952	73.575				
13	.689	2.755	76.330				
14	.674	2.696	79.026				
15	.651	2.604	81.631				
16	.584	2.336	83.967				
17	.532	2.127	86.093				
18	.529	2.115	88.209				
19	.506	2.023	90.232				
20	.474	1.896	92.128				
21	.461	1.842	93.970				
22	.422	1.690	95.660				
23	.402	1.607	97.267				
24	.376	1.504	98.771				
25	.307	1.229	100.000				

Extraction Method: Principal Axis Factoring

The above table gives eigenvalues, variance explained, and cumulative variance explained for the factor solution. The first panel gives values based on initial eigenvalues. For the initial solution, there are as many factors as there are variables. The "Total" column gives the amount of variance in the observed variables accounted for by each factor. The "% of Variance" column gives the percent of variance accounted for by each specific factor, relative to the total variance in all the variables. The "Cumulative %"

column gives the percent of variance accounted for by all factors up to and including the current one. For instance, the Cumulative % for the second factor is the sum of the % of Variance for the first and second factors. In the above table, there are a few factors that explain a lot of the variance which is a sign of good factor analysis and the rest of the factors explain relatively small amounts of variance.

The Extraction Sums of Squared Loadings group gives information regarding the extracted factors or components. For Maximum Likelihood extraction method, these values will generally be smaller than the initial values, due to errors in measurements.

In the "Rotation Sums of Squared Loadings" group, the variance accounted for by rotated factors or components may be different from those reported for the extraction, but the Cumulative % for the set of factors or components will always be the same.

Table 1.4 Pattern Matrix[a]

	Factor				
	1	2	3	4	5
SI1Hea	.762				
SI2Swe	.732				
SI3Tir	.699				
SI4Gri	.498				
SI5Thr	.766				
SI6Hum	.590				
SI7Har	.607	.209		-.234	
SI10Co			.434		
SI11In		.471			
SI12Te		.406			
SI13Ex		.292			
SI14Ca	.359				
SI15La		-.239	.380		.448
SI16Wo					.640
SI17La			.297		

SI18Ti			.299		
SI19Fa		.474			
SI20As		.328		.372	
SI21Un		.286		.495	
SI23Be			.203	.338	
SI24Du			.217	.354	
SI25Re		.492			
SI26Ma		.401	.329		
SI27Co			.539		
SI28Re		.316	.433		

Extraction Method: Principal Axis Factoring.

Rotation Method: Promax with Kaiser Normalization.

Rotation converged in 11 iterations.

The above table reports the factor loadings for each variable on the factors after rotation. For example each number represents the partial correlation between the item (.762) and the rotated factor (Factor 1). These correlations can help the researcher to formulate an interpretation of the factors. This is done by looking for a common thread among the variables that have large loadings for a particular factor. This exercise can be well depicted by the below table 1.5.

Factors	**Loadings**	**Variables**	**% of Variance of Each Factor**
Physiological Symptoms	0.762	I often have headaches and migraines	24.239
	0.732	I usually suffer from the problems of sweating, palpitations and trembling	
	0.699	I feel tired even when I wake after an adequate sleep	
	0.498	I find myself grinding my teeth	

	0.766	I often suffer from throat chocking	
	0.59	I have lost sense of humour	
	0.607	I work hard but accomplish little	
	0.359	Increased caffeine intake (coffee, tea, etc.,)	
Inadequate facilities and poor administration	0.471	Receiving inadequate salary to meet financial needs	7.053
	0.406	Having repetitions in teaching assignments	
	0.474	Inadequate facilities (office, library, labs, etc,)	
	0.492	Insufficient institutional recognition and support for research	
	0.401	Frequent changes in management policies	
Poor interpersonal relationship	0.434	Feeling pressure to compete with my colleagues	2.545
	0.539	Covering work for another employee	
	0.433	I often make complaints with colleagues about work related things	
Unexpected work situations	0.372	Assignment of duties without consultation	1.931
	0.495	Unreasonable expectations from colleagues, students or your head of department	

	0.354	Assignment of duties that take me away from my college	
Increased workload	0.448 0.640	Teaching large class or more students Increased workload	1.605

Interpretation of the factors

In this study, only the variables with high loadings (0.35+) were selected for interpretation. Small factor loadings were omitted from the table. Of the original pool of 28 items, 21 specific stress statements loaded highly (0.35+) on one of the five factors produced by the factor analysis. These five factors in combination account for 37.373% of the total variance (see Table 1.5). The explored factors and their respective loaded variables are shown in table 1.5. We can also priorities the factors based on the percentage of variance of each factor.

The first factor was labeled physiological symptoms which accounts for 24.239% of the common variance. There are eight items loading on this factor. All the variables directly reflect the symptoms of physiological problems.

The second factor was labeled inadequate facilities and poor administration which accounts for 7.053% of the common variance. Four of the five items loaded on this factor directly pertain to poor or improper administration (Receiving inadequate salary to meet financial needs, having repetitions in teaching assignments, insufficient institutional recognition and support for research, frequent changes in management policies). One item pertains to inadequate infrastructure facilities (such as inadequate facilities (office, library, labs, etc.).

The third factor was labeled poor interpersonal relationship which accounts for 2.545% of the common variance. Of the three items loaded on the fourth factor two items directly pertain to poor interpersonal relationship at work (Feeling pressure to compete with my colleagues, I often make complaints with colleagues about work related things). The remaining one item is directly or indirectly related to interpersonal relationship at work (Covering work for another employee).

The fourth factor which accounts for 1.931% of the common variance was labeled unexpected work situations. Two of the three items loaded on this factor directly pertain to unexpected work situations (Assignment of duties without consultation, Assignment of duties that take me away from my college). The remaining one item is directly or indirectly related to unexpected work situations (Unreasonable expectations from colleagues, students or your head of department).

Finally the fifth factor accounting for 1.605 of the common variance was labeled increased workload. The two items loaded on this factor pertain to increased work load (Teaching large class or more students, increased workload).

2. CONFIRMATORY FACTOR ANALYSIS

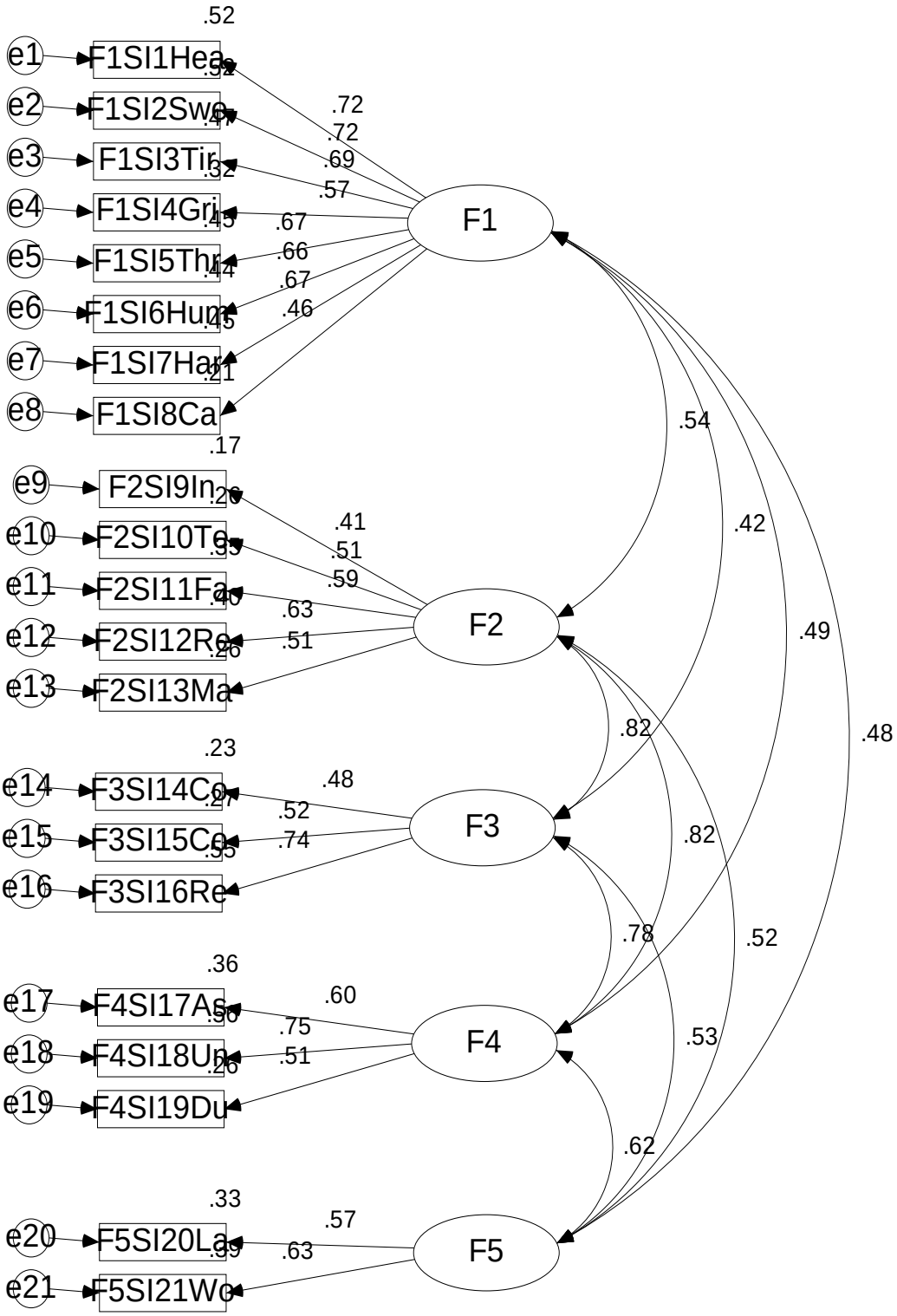

Figure 2.1 Confirmatory five factor Measurement Model (CFA-Analysis)

Measurement model Occupational stress (OS) scale was tested by confirmatory factor analysis in order to focus on the relationship of each latent variables namely, F1, F2, F3, F4 and F5 and with that of their respective observed indicators. A confirmatory factor analysis for OS Instrument was processed using the Amos 16 software program. Amos implements the general linear model and common factor Analysis known as structural equation modeling (SEM), also known as analysis of covariance structures, (or) causal modeling (Arbuckle and Wothke 1999).

The initially hypothesized CFA model of OSI was designed to test the relationships among five dimensions of OSI namely, F1, F2, F3, F4, and F5 was extracted through exploratory factor analysis from the data captured out of the OS scale developed with the literature and content validation.

Reliability analysis of OSI

Reliability of the measures used in this study was confirmed by Cronbach's alpha coefficient value. The values ranged between 0.85 and 0.53, indicating a high internal consistency (Nunnaly and Bernstein 1994). Based on the suggestions from Hair et al (1998); the value of Cronbach's coefficient alpha on F1 was .85, the value of cronbach's coefficient alpha on F2 was .66; the value of Cronbach's coefficient alpha on F3 was .59; the value of Cronbach's coefficient alpha on F4was .65 and the value of Cronbach's coefficient alpha on F5 was .53.

This OSI instrument items were developed with the help of various occupational stress tested Instruments and from various contemporary research findings literature. Hence this specific OS Scale developed using EFA was confirmed statistically by CFA, which caters to the Indian higher education sector and more specifically to the Self-

Financing Engineering Colleges Located in the seven districts namely Trichy, Thanjavur, Thiruvarur, Nagapattinam, Cuddalore, perambalur and Pudukkottai.

It is an instrument designed to allow faculty members to reflect their opinion on the occupational stress indicators. This avoids the potential psychometric problems associated with the other OSI scales. The scale also avoids the negatively worded question items found in the other OSI instruments.

The 21 OSI scale items that make up occupational stress have factor loadings of .05 (or) greater and encompass five dimensions. The operational definitions of the five dimensions and the individual 21 Occupational stress indicators are presented in Table 1.5.

The instrument's reliability, dimension loading and validity were all empirically tested and the results were “encouraging both in their own right and when compared with other studies”. The following GOF indices portray the degree to which the OSI model fits with the observed data through confirmatory five factor measurement model. On the basis of the aforementioned results, all the GOF results fall into an acceptable level of Fit with respect to the previous research conducted by Hair et al (1998); schummacker and Lomax (1996).

Table 2.1 Confirmatory factor Analysis for OSI Scale-Goodness-of-fit statistics

S.No	Goodness-of-fit statistics	Values	Desired value of goodness fit criteria
	Absolute Fit Measures		
1.	Chi-square test-x^2	355.9	p>.05
2.	Degrees of freedom-df	179	0
3.	Chi-square/degrees of freedom ratio -x^2/df	1.988	1-4
4.	Goodness-of-fit index-GFI	.93	>.90
5.	Root mean square error of approximation-RMSEA	.04	<0.1
6.	Root mean square Residual-RMR	.05	<0.5
S.No	**Incremental fit Measures**	**Values**	**Desired value of Goodness Fit criteria**
1.	Adjusted goodness -of-fit index-AGFI	.91	>.90
2.	Relative fit index-RFI	.84	>.90
3.	Normal fit index-NFI	.86	>.90
4.	Comparative fit index-CFI	.93	>.90
5.	incremental fit index-IFI	.93	>.90
6.	TLI	.91	>.90
S.No	**Parsimonious fit measure**	**values**	**Desired value of Goodness Fit Criteria**
1.	Parsimonious nor med fit index-PNFI	.73	>.50
2.	Parsimonious goodness-of-fit index-PGFI	.72	>.50

Source: Amos output-Version 16.

Table 2.2 Standardized Regression Weights of OS Scale items.

OS Variables / Factors			Estimate
F1SI1Hea	<---	F1	.722
F1SI2Swe	<---	F1	.721
F1SI3Tir	<---	F1	.686
F1SI4Gri	<---	F1	.567
F1SI5Thr	<---	F1	.673
F1SI6Hum	<---	F1	.663
F1SI7Har	<---	F1	.671
F1SI8Ca	<---	F1	.456
F2SI9In	<---	F2	.413
F2SI10Te	<---	F2	.510
F2SI11Fa	<---	F2	.591
F2SI12Re	<---	F2	.629
F2SI13Ma	<---	F2	.514
F3SI14Co	<---	F3	.484
F3SI15Co	<---	F3	.517
F3SI16Re	<---	F3	.739
F4SI17As	<---	F4	.597
F4SI18Un	<---	F4	.746
F4SI19Du	<---	F4	.513
F5SI20La	<---	F5	.571
F5SI21Wo	<---	F5	.626

From the above table, the estimate of standardized regression weight of OS Variables on OS factors can be interpreted as when F1 goes up by 1 standard deviation, F1SI1Hea goes up by 0.722 standard deviations.

Findings

From the above analysis and interpretations, the researcher has identified five major factors predicting occupational stress among faculty members on the basis of factor analysis. Further they were named according to the similarities of variables in each group as Physiological symptoms, Inadequate facilities and poor administration, Poor interpersonal relationship, Unexpected work situations and Increased work load. The instrument's reliability, dimension loading and validity were all empirically tested and the results were "encouraging both in their own right and when compared with other studies". On the basis of the CFA, all the GOF results fall into an acceptable level of Fit with respect to the previous research conducted by Hair et al (1998).

Conclusion

It is concluded from the above study titled "**A Study on Identifying the various key Factors Predicting Occupational Stress Among Faculty Members Working in Selective Self-Financing Engineering Colleges"** When a teacher perceives occupational stress it affects the teacher first then the organization for which he or she is working ultimately the students' community who are going to decide the future of the nation. So it is important for the organization to address the major key factors predicting occupational stress amongst faculty members.

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