www.irmbrjournal.com June 2017
International Review of Management and Business Research Vol. 6 Issue.2

Causes of Stress Among PhD Research Scholars with Reference to Rashtrasant Tukadoji Maharaj Nagpur University: An Empirical Analysis

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Abstract

The present study reports the results of an empirical analysis on the causes of stress among PhD Research Scholars with reference to Rashtrasant Tukadoji Maharaj Nagpur University. A survey using stress questionnaire consisting of 35 multiple choice statements on 50 Research Scholars who participated in the Pre-PhD Course work at CP & Berar E.S. College, Nagpur was carried out during December 2016, the course work period. Six independent stress causing factors Work overload, Role ambiguity, Role overload, Physiological factors, and Behavioural Approach and Avoidance strategies and their effect on a dependent factor performance were assessed. We carried out the descriptive, correlation, Analysis of Variance and Multiple regression analysis to predict the cause and effect of six said independent variables on a dependent variable performance. The reliability and internal consistencies of the research instrument was measured using the reliability statistic Cronbach Alpha. The Cronbach Alpha values for all the factors varied from 0.66 to 0.80, whereas overall Cronbach Alpha measured at 0.78 indicating strong internal consistencies among the items of the research instrument. The statistical analysis reveal medium level stress among the research scholars and behavioural avoidance coping strategies has significant effect on reducing the stress(P<0.013), whereas the physiological factors (P<0.002) significantly contributed to the stress among the research scholars.

Key Words: *Stress, Research Scholar, Cronbach Alpha, Coping Strategies, Course Work.*

Introduction

The stress is a condition realized by a person when demand surpasses the availability of personal energy or resources. The Austrian born Endocrinologist Dr Hans Selye first dissected the concept stress in 1936. The stress in escapable and effects the human beings irrespective of the sectors and only the degree and stress causing factors differ. A report published by International Labor Organization reported that the occupational stress will csot about 10% of country's Gross National Product (Midgley, 1996). The Mid-Day web-site cited that Rhe Research Scholars' Companion Program (RSCP) at Indian Institute of

Technology, Mumbai in association with the counselling centre at the institute has organised a stress management programme for PhD research scholars to cope the stress (Web-Report, Pallavi Samrat, 2016). A research study on the relationship between stress and mental health in university among male and female students reported a negative correlation between stress and mental health and results are not significant (Ali Mostafaei, 2012).

Prabhakar and Gowthami (2014) in their study on sources of academic stress surveying 500 management students in Warangal District of Andhra Pradesh concluded that the factors like regular attendance, achieving academic goals and meeting deadlines significantly influence causing stress in the students. Hirsch & Ellis (1996) reported the pressure to earn good grades and to earn a degree is one of the stress causing factor among the students. Kirsten Schuder (2014) in her article Physiological responses to stress elucidated the physiological responses such as secretion of stress hormones, increased cortisone and adrenaline production and narrated about the physical effects of chronic physiological stress.

Review of Literature

In general, the human beings body reacts to the demand placed on it (Hans Selye). Researchers proposed several theories on stress. Hans Selye's (1956) General Adaptation Syndrome explained very comprehensively the stress phenomenon. Pareek (1983) reported the persons working in different roles also a major stress causing factor and developed organizational role stress scale (ORS) to measure ten role stressors. Osipow and Spokane (1987) developed theory on role overload and its causes of stress when a person perceives more than one role in his/her life. Emily Driscoll (2011) in his column narrated the cause of stress and effects of chronic stress in college students. He identified that relationship among the students also once of the cause for stress and warned a constant of stress affect physical, mental, and behavioural aspects of the student. The stress among the students results in a decline in the academic accomplishments, and affect the physical and mental state of the students. The research suggested that coping with stress will have a significant impact in higher education. (Scott, 2009) he stress causing factors academics; social, emotional and financial matters has immensely effect on the academic success of a college student (Kadapatti & Vijayalaxmi, 2012). Lakyntiew Pariat et.al. (2014) studied the interrelationship between stressors and coping strategies among the college students and concluded that appropriate coping strategies can reduce the stress in students.

The stress is found in all the sectors/areas and research scholars are not exception on escaping of this silent killer and the stress has significant psychological, physiological and performance effects on human resources. The stress can be job related, organization related, individual related and physiological related or academic related. Therefore the tress is inevitable in all the areas and research scholars are no exception. The authors carried out this study to measure causes of stress, coping strategies and its effect on research scholar performance. The proposed study was conducted in CP & E.S. Berar College, Nagpur during December 2016.

Objectives and Hypotheses

- To identity the existence and causes of "stress" a silent killer among the Scholars.
- To assess how academic related stress and its physiological reaction affect the research scholars.
- To suggest the coping strategies to address stress related issues.

Research Question

Is pre-PhD Research Scholars really experience stress? Is Stress really effecting their performance?

Hypothesis

H_{01}: Occupational Stress is not significantly related to Performance of the Pre-PhD Course Research Scholars.
H_{11}: Occupational Stress is significantly related to Performance of the Pre-PhD Course Research Scholars.
H_{02}: Occupational stress is not significantly related to coping of the Pre-PhD Course Research Scholars.
H_{12}: Occupational stress is significantly related to coping of the Pre-PhD course Research Scholars.

Methodology

Research Design

Positivistic research approach has been used as it relies mainly on quantitative data, using relatively large samples and is concerned with hypotheses testing, structured research design and objective method using cross-sectional design. A Descriptive Research Method using survey method, with specific hypotheses was carried out.

Conceptual Framework

The proposed framework was adopted based on the past research by Karunanithy and Ponnampalam (2013) and Prasad et al. (2016). The independent factors stress is measured suing six dimensions Workoverload, Role Ambiguity, Role Overload, Physiological factors, Behavioural approach and Behavioural avoidance coping strategies and the Research Scholar Performance as dependent factor. The following framework is formulated based objectives and its linkages to the variables of the study (Figure 1).

Sample Size

The total sample size is 50, because the total pre-PhD course work participants 49 and 1 from faculty.

Research Instrument

A structured questionnaire with 35 statements is source of the primary data collection. The questionnaire consists of 2 sections; general information was gathered in the first section. In the second section, the 35 statements to measure the stress levels, coping strategies, and its impact on research scholar performance was used.

Table 1. Stress, coping and performance factors used in the study

S. No.	Factor	Description of items
1	Work overload	4: Excessive work pressure, overtime, pressure
2	Role ambiguity	4: Unclear explanation of role, confusion, too many untrained assignments, etc.
3	Role conflict	4: dual roles, instructions from too many supervisors, family and personal roles
4	Physiological factors	4: nervousness, muscle pain, bloating stomach
5	Approaching coping	5: Confront, Plan, Impulsive decision, alternative solutions, console, scheduling action plan, etc.
6	Avoidance Coping	4: Leave, Off to sleep, smoking, alcohol, excessive eating, escaping, withdrawal, resignation, etc.
7	Performance	5: Regular attendance, goal achievement, grades, relationship, Meeting deadlines

The statements are related to three stress causing independent factors Work overload, Role ambiguity, Role overload, two coping strategies – Behavioral Approach and Behavioral avoidance and performance a dependent factor. The respondents requested to select the appropriate answer based on their realization and degree of experience of stress. To measure the independent factors and effect on dependent factors 4-5 statements for each factor was used (Table 1).

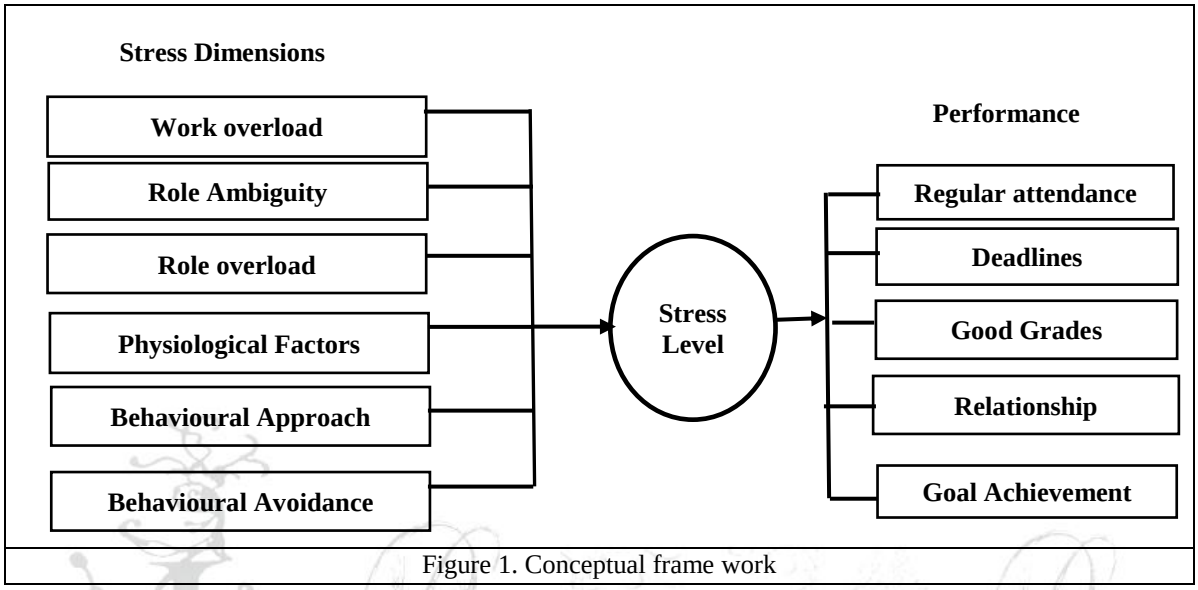

Figure 1. Conceptual frame work

Statistical Methods

In our empirical study, we have used the descriptive statistics to summarize the data, correlation and regression analysis used to measure cause and effect relationship of independent variables on dependent variable.

Reliability Statistics

The Cronbach Alpha (C-alpha) was estimated for all the 7 factors to measure the internal consistencies and reliability of our research instrument and all the other statistical analysis using Statistical Analytical System (SAS) (SAS Institute, 2008).

Reliability test of the Research Instrument

The Likert scale with the scale 1-5 was used (1=Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree, and 5=Strongly Agree) for this study. The C-alpha reliability statistic was estimated to measure how all the items in the research instrument related to the total instrument.

The measured C-alpha values ranged from 0.66 to 0.80 for all the 7 factors with overall C-alpha being 0.71 indicating strong internal consistency among the items (Gay et al. 2006). However, 5 statements with terrible C-alpha was dropped out of this study and one of the main reason for the low C-alpha for 5 statements is the nature of the sample (Table 2).

Table 2. Measured Cronbach alpha values for the study factors	
Factor	C-Alpha Value
Overall	0.78
Work overload	0.72
Role Ambiguity	0.68
Role conflict	0.66
Physiological	0.70
Approach coping	0.74
Avoidance coping	0.79
Performance	0.80

The measured overall mean was $\bar{X}$ 3.30 and Standard Deviation estimated σ =0.7, and based on these values Low, Medium and High stress levels were determined (Table 3).

Table 3. Determination of level of stress and rating of the score for stress in research scholars	
Mean	Standard deviation
$\bar{X}$ 3.30	σ =0.7
Rating and range of the score	
$(\bar{X} + \sigma)$ = 3.30+0.70 =4.0 (>4.0)	High level
$(\bar{X} + \sigma)$ = 3.30-0.70 =2.60 (<2.60)	Low Level
2.60 to 3.30	Medium Level

The above rating was determined based on the symmetric distribution of data, and the expected range for any symmetric distribution will be six times of the standard deviation (Francis 2008, Sumathi and Nandagopal, 2014). In the present study the primary research instrument has 30 statements out of which 5 are reverse keyed. The minimum score is 1 and maximum is 5. Minimum range value is 30(30 * 1) and maximum range value is 150 (30*5) for 30 questions and the range is 4. The estimated Standard Deviation 0.7 which is near normal to range (i.e 6 times of standard deviation 0.7 x 6). The high level stress was determined adding standard deviation to Overall mean, the difference between the Mean and standard deviation is low level and the level between low and Mean is set as Medium Level. (Table 3).

To assess the independent stress factors Work overload, Role Ambiguity, Role Overload, Physiological factors and coping factors Behavioural Approach and Behavioural Avoidance effect on research scholar performance the primary data gathered was analyzed. The Table 4 presents the estimated Mean and Standard Deviation, and overall standard error value of 0.07 indicating that the means are relatively close to the true mean of overall population (Table 4).

Table 4. Mean, Standard Deviation and Standard Error in mean respondents in factor scale		
Factor	Standard Deviation	Standard Error of Mean
Workload	0.71	3.5±0.11
Role Ambiguity	0.67	3.7±0.10
Role Conflict	0.74	3.3±0.11
Physiological	0.85	3.01±0.13
Behavioural Approach	0.5	3.65±0.07
Behavioural Avoidance	0.51	2.57±0.08
Performance	0.92	1.99±0.14

Results

Correlation studies: The independent factors Work overload, Role Ambiguity, Physiological Factors, Behavioural Approach Behavioural Avoidance coping strategies negatively correlated with Performance (r= -0.23, -0.13, -0.60, -0.15, -0.51), a positive correlation can be observed between Role Overload and Performance (r=0.12). The correlations are very weak and with the available results we can conclude that the there is any significant relationship with independent and dependent factors (Table 5.)

Table 5. Correlation studies (correlations among the study factors)

	Work overload	Role Ambiguity	Role Overload	Physiological Factors	Behavioural Approach	Behavioural Avoidance	Performance
Work overload	1						
Role Ambiguity	0.15	1					
Role Overload	0.05	0.23	1				
Physiological Factors	0.11	0.19	-0.19	1			
Behavioural Approach	0.25	-0.06	-0.11	0.22	1		
Behavioural Avoidance	0.11	-0.06	-0.15	0.40	0.50	1	
Performance	-0.23	-0.13	0.12	-0.60	-0.15	-0.51	1

Multiple Regression Analysis

To predict the value of dependent factor research scholar performance, the multiple regression analysis was performed using 6 independent factors and to measure and cause and effect relationship stress and research scholar performance (Table 6). The independent factors has 49% influence on stress and effect the research scholars performance, indicating 49% variability of performance is accompanied for the factors in the model (Table 6). The amount of expected change in performance can be observed from the coefficients of each factor given a unit's change in the value of that factor, when all the other factors are held constant. If we consider the work overload, there will be a decrease of 0.23 units in the performance for every unit increase in work overload assuming that all other factors in the model are held constant (Table 7). Similarly, one can expect an increase 0.38 units in performance if Behavioural Approach coping strategies followed to mitigate the stress. The computed standardized Beta (ß) values indicate the strength among the coefficients. Considering the Beta value of Work Overload, one standard deviation increase on work overload will lead to the one standard deviation decrease in predicted performance, with all other factors held constant. In the same one standard deviation increase in appropriate Behavioural approach strategies will increase 0.20 standard deviation increase in performance, with all other factors held constant. The physiological and behavioural avoidance factors has significance influence on this model (Table 7).

Table 6: Results from Multiple Regression Analysis (Analysis of variance)

Variable	Model	R	R Square	ANOVA F value	P value
Stress	1	0.7076	0.4962	5.42	<.0005
Source: Survey data					

Table 7. Results from multiple regression analysis						
Factor	Description	Unstandardized Coefficients		Standardized Coefficients (ß)	t	P
Stress	(Constant)	4.69769	1.23567	3.8	0.0006	0
	Work overload	-0.23838	0.1681	-1.42	0.1655	-0.18396
	Role Ambiguity	-0.0532	0.18357	-0.29	0.7738	-0.03832
	Role Overload	0.07564	0.16116	0.47	0.6419	0.06049
	Physiological factors	-0.48671	0.15091	-3.23	0.0028	-0.44963
	Behavioural Approach	0.38541	0.27295	1.41	0.1673	0.20801
	Behavioural Avoidance	-0.72296	0.27577	-2.62	0.0131	-0.40219

The multiple regression analysis was also carried out on overall stress factors against performance and observed 24% variance is accompanied in performance in the model (Table 8). One standard deviation increase in overall stress, there will be 0.49 standard deviation decrease in performance predicted in the model. Overall a medium level of stress among the research scholars predicted with the model (Table 9).

Therefore from the results of the multiple regression analysis we reject the null hypothesis H_{01}: Occupational Stress is not significantly related to Performance of the Pre-PhD Course Research Scholars and accept the alternate hypothesis H_{11}: Occupational Stress is significantly related to Performance of the Pre-PhD Course Research Scholars; and reject the H_{02}: Occupational stress is not significantly related to coping of the Pre-PhD Course Research Scholars and accept the alternate hypothesis H_{12}: Occupational stress is significantly related to coping of the Pre-PhD course Research Scholars.

Table 8: Results from Multiple Regression Analysis (Overall)					
Variable	Model	R	R Square	ANOVA F value	P value
Stress	1	0.49713	0.2418	12.12	<.0013
Source: Survey data					

Table 9. Results from multiple regression analysis						
Factor	Description	Unstandardized Coefficients		Standardized Coefficients	t	P
Stress	(Constant)	6.39243	1.27092	0	5.03	0.0001
	Overall	-1.33397	0.38314	-0.49178	-3.48	0.0013

From the values of Table 7, the estimated regression coefficients, the sample regression equation can be written as:

$$Y=4.96-0.23_{wol}-0.05_{ramb}+0.12_{rol}-0.48_{physiol}+0.38_{bapp}-0.722_{bavoi}$$

Discussion

The data gathered was analysed to predict the effect of stress and coping on research scholar performance. From the overall mean value of 3.30 it was observed there exists medium level stress in research scholars and effect the performance. Work Overload is causing more stress and behavioural approach strategies will reduce the stress and increase the performance. The overall multiple regression analysis results also predicted the similar results in the study. Results of this study are in line with the regression studies carried

out by Vishal Samartha et al. (2013); Murray et al. (2006), and Dasgupta et al. (2002) who pioneered the research in the area of stress using multivariate analysis.

Conclusions

Stress is in escapable and exists in all forms of the life. The authors carried out this study to measure the causes of stress and its effect on research scholar performance on pre-PhD course work research scholars during 5-15 December 2016, in CP Berar & E.S. College, Nagpur using a structured questionnaire. In general the survey research has several problems such that researcher do not know whether the real respondent has answered the questionnaire, the perception and mental state of the respondent at the time he/she is answering to the statements. The authors has drop the five statements because of low C-alpha values one such example is the statement "do you consume alcohol when stressed" because of the sample profile and some are young, energetic at the beginning of their career. However, the author published 3 papers on the similar study and the same question received different answer when survey was carried out in IT sector around Hyderabad. Another factor might have effected this study is that the authors have to content with the sample size of 50 and even though dropping of five statements marginally effect the study

The authors strongly believe the logistic regression and multinomial logistic regression analysis is a better option than multiple regression to address the bell shed curve problem with regression analysis. For this study a researcher need a bigger sample size with some categorical variable for predicting near perfect results.

Acknowledgment

The Authors thank the Dr. Medha Kanetkar, Coordinator Place For Higher Learning and Research, C.P. & Berar College, Tulsibag, Mahal, Nagpur for giving first author an opportunity to undergo the course work. The authors are very grateful to UGC-Human Resources Development Centre and its faculty Dr Rekha Sharma for delivering thoughtful lectures. Thanks are due to all the faculty who guides the first author and all Pre-PhD course work research scholars for enthusiastically participated in the survey. This study is a part of the Seminar and Reports during the Pre-PhD Course work.

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