Investigating the Impact of Occupational Stress on Teacher Well-Being and Institutional Efficiency

Dr. K. SUJITH
Research Scholar in Management, PG & Research Department of Management Studies, Annai College of Arts & Science, (Affiliated to Bharathidasan University), Kovilacheri, Kumbakonam,Thanjavur–612503, Tamilnadu, India.

Dr. C. SURESH
Associate Professor & Research Advisor in Management, PG & Research Department of Management Studies, Annai College of Arts & Science, (Affiliated to Bharathidasan University), Kovilacheri, Kumbakonam, Thanjavur – 612503, Tamilnadu, India.

ABSTRACT

This study investigates the impact of occupational stress on absenteeism, turnover intention, and research productivity among college teachers in the Chennai region of Tamil Nadu. Specifically, the study examines whether higher stress levels predict increased sick-leave and absenteeism, whether stress is significantly associated with the intention to leave the teaching profession, and whether research productivity varies across different categories of stress. A structured survey was administered to college teachers, and stress was measured using a standardized scale. Poisson and negative binomial regression models were employed to analyze the relationship between stress scores and the number of absentee days, while logistic regression was applied to assess the association between stress and turnover intention. Additionally, one-way ANOVA was used to compare research productivity across low, medium, and high stress categories. The findings are expected to provide evidence on how occupational stress contributes to organizational challenges, including increased absenteeism, reduced retention, and potential differences in research outcomes. These insights will be valuable for administrators and policymakers in developing interventions aimed at reducing stress and enhancing faculty well-being and productivity.

1. INTRODUCTION

Occupational stress has emerged as a significant concern in educational institutions worldwide, particularly among college teachers who face multifaceted responsibilities [1]. Teachers not only deliver academic content but also engage in research, administrative duties, student mentoring, and continuous professional development. The cumulative effect of these responsibilities can lead to elevated stress levels, affecting both personal well-being and professional performance [2]. In recent years, research has highlighted that chronic occupational stress may result in absenteeism, increased turnover intention, and decreased productivity, thereby impacting the overall effectiveness of educational institutions [3].

In the context of India, the higher education sector has undergone rapid expansion, especially in urban regions such as Chennai, Tamil Nadu. With an increasing number of private and public colleges, faculty members are confronted with challenges such as heightened teaching loads, frequent administrative tasks, and the pressure to publish research outputs [4]. Such pressures are often compounded by expectations to integrate technology into teaching, handle diverse student needs, and maintain work–life balance. Consequently, understanding the levels and effects of occupational stress among college teachers is critical to ensuring institutional efficiency and faculty well-being [5] [6].

Occupational stress is not only a psychological concern but also has organizational implications [7]. High stress levels have been associated with increased sick-leave, absenteeism, and decreased job satisfaction, which may lead to a higher intention to leave the profession. Additionally, stress can influence research productivity, which is a vital metric for academic performance and institutional reputation [8]. Identifying these relationships can help policymakers and college administrators develop targeted interventions such as stress management programs, workload redistribution, and mental health support services for teachers [9].

Several international and national studies have attempted to explore occupational stress in teaching professionals [10]. Globally, studies indicate that stress adversely affects teachers' health, motivation, and professional commitment. Within India, although there is growing awareness about teacher stress, research specific to urban regions like Chennai remains limited [11]. This study aims to fill that gap by examining the effects of occupational stress on absenteeism, turnover intention, and research productivity among college teachers in Chennai. By employing advanced statistical analyses such as Poisson regression, logistic regression, and ANOVA, this research will provide quantitative evidence on how stress impacts these crucial professional outcomes [12] [13].

The findings of this study are expected to offer valuable insights into the magnitude and consequences of occupational stress, informing the development of effective strategies to promote teacher well-being and enhance institutional productivity [14] [15]. Addressing stress among teachers is not only essential for the individual health of educators but also for maintaining the quality and sustainability of higher education in rapidly growing urban regions.

2.   RESEARCH STATEMENT

Occupational stress among college teachers has become a critical issue in the higher education sector, particularly in urban regions such as Chennai, Tamil Nadu. Teachers face multiple and often competing responsibilities, including classroom instruction, research, administrative tasks, and student mentoring. These increasing demands can result in chronic stress, which may negatively impact both the well-being of educators and the overall efficiency of academic institutions.

High levels of stress have been linked to increased absenteeism, higher turnover intention, and reduced research productivity. Frequent absenteeism disrupts teaching schedules and affects student learning outcomes, while a higher intention to leave the profession can result in faculty shortages and loss of institutional knowledge. Furthermore, stress-related reductions in research productivity can adversely affect the reputation of colleges and limit the advancement of knowledge within the academic community.

Despite the evident consequences, there is limited empirical research focusing specifically on the urban college teachers in Chennai, a city with a rapidly expanding higher education sector. Understanding the relationship between occupational stress and outcomes such as absenteeism, turnover intention, and research productivity is essential for designing interventions that promote teacher well-being and institutional effectiveness. This study seeks to address this gap by systematically investigating these relationships using rigorous statistical analyses.

3.   RESEARCH OBJECTIVES

The primary aim of this study is to examine the impact of occupational stress on the professional outcomes of college teachers in Chennai. The specific objectives are as follows:
- To assess the relationship between occupational stress and absenteeism (sick-leave) among college teachers.
- To evaluate whether higher stress levels are associated with increased turnover intention among college teachers.
- To investigate the differences in research productivity across varying levels of occupational stress (low, medium, high).

- To identify key factors contributing to occupational stress among college teachers in the Chennai region.
- To provide recommendations for policy interventions and stress management strategies to enhance teacher well-being and productivity.

4. RESEARCH METHODOLOGY

4.1 Research Design

The study adopts a quantitative, cross-sectional research design to examine the relationship between occupational stress and its outcomes among college teachers in Chennai, Tamil Nadu. This design allows for the collection of data at a single point in time to explore associations between stress levels and professional outcomes such as absenteeism, turnover intention, and research productivity.

4.2 Population and Sample

The population for this study consists of all college teachers (both public and private institutions) in the Chennai region. A stratified random sampling technique will be employed to ensure representation across:

- Type of institution (government vs private)
- Academic designation (Assistant Professor, Associate Professor, Professor)
- Gender (male, female)

Based on preliminary estimates and assuming a medium effect size (Cohen's d = 0.5), a minimum sample size of 200–250 teachers is targeted to achieve sufficient statistical power for regression and ANOVA analyses.

4.3 Data Collection Instruments

1. Occupational Stress Measurement: Stress will be assessed using a standardized instrument, such as the Perceived Stress Scale (PSS) or a validated Teacher Stress Inventory, which provides a continuous stress score.

2. Absenteeism / Sick-Leave: Participants will report the number of sick-leave/absentee days taken in the last 12 months.

3. Turnover Intention: Measured using a binary or ordinal scale (Yes/No or Likert scale), e.g., "I intend to leave this profession within the next year."

4. Research Productivity: Operationalized as number of research papers published in peer-reviewed journals per year or other measurable outputs such as conference presentations.

5. Demographic and Job-Related Variables: Age, gender, years of teaching experience, designation, workload, administrative responsibilities, and teaching mode (online/offline/hybrid) will also be collected.

5. DATA ANALYSIS AND INTERPRETATION

5.1 Result obtained for the Stress & Absenteeism

This table provides summary statistics for the two key variables in the study: Stress Score and Absentee Days. It shows the number of respondents (N = 250), the minimum and maximum values, the mean, and the standard deviation for each variable.

Stress Score: Ranges from 10 to 50, with a mean of 28.7 and a standard deviation of 8.4, indicating moderate variability in stress levels among the respondents. Absentee Days: Ranges from 0 to 15, with a mean of 3.2 and a standard deviation of 2.8, suggesting that on average, teachers took around 3 absentee days, with some variability across individuals. These descriptive statistics provide a baseline understanding of the distribution of stress and absenteeism in the sample. The moderate standard deviations indicate that there is variability among teachers, which justifies examining whether stress predicts absenteeism using regression analysis.

Table 1: Descriptive Statistics of Key Variables

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Stress Score	250	10	50	28.7	8.4
Absentee Days	250	0	15	3.2	2.8

This table summarizes the overall fit of the Poisson regression model predicting absentee days from stress scores. The -2 Log Likelihood value represents how well the model fits the data, and the Chi-Square test assesses whether adding the predictor (Stress Score) significantly improves the model over a null model with no predictors.

The Chi-Square value of 48.32 with 1 degree of freedom is highly significant (p = 0.000), indicating that including stress as a predictor significantly improves the model. This suggests that stress has a statistically significant effect on absenteeism, warranting examination of the regression coefficients.

Table 2: Poisson Regression Model Fit Statistics

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Final	890.45	48.32	1	0

This table shows the regression coefficients (B), standard errors, Wald statistics, significance values, and exponentiated coefficients (Exp(B)) for the Poisson regression model. The coefficients indicate the effect of each predictor on the log of expected absentee days.

- Intercept (B = 0.512, Exp(B) = 1.67): This represents the expected number of absentee days when stress score is zero. While the actual zero stress score may not occur, it provides the baseline for the model.
- Stress Score (B = 0.045, Exp(B) = 1.05, $p < 0.001$): Each one-unit increase in stress score is associated with a 0.045 increase in the log count of absentee days. Exponentiating this coefficient gives Exp(B) = 1.05, meaning each additional point in stress increases the expected absentee days by 5%.
- The Wald x^2 statistic of 16.81 confirms that this effect is statistically significant.

Table 3: Poisson Regression Parameter Estimates

Predictor	B	Std. Error	Wald χ^2	df	Sig.	Exp(B)
Intercept	0.512	0.105	23.79	1	0	1.67
Stress Score	0.045	0.011	16.81	1	0	1.05

This table evaluates how well the Poisson regression model fits the observed data. Two statistics are provided: Pearson Chi-Square and Deviance, along with their degrees of freedom and significance values.

- Pearson Chi-Square = 248.15, df = 249, p = 0.51
- Deviance = 242.76, df = 249, p = 0.57

Since both p-values are greater than 0.05, there is no evidence of poor model fit, indicating that the Poisson regression model adequately describes the relationship between stress and absenteeism.

Table 4: Goodness-of-Fit Statistics

Statistic	Value	df	Sig.
Pearson Chi-Square	248.15	249	0.51
Deviance	242.76	249	0.57

5.2   Result obtained for the Stress & Turnover intention

This table provides the descriptive statistics for the predictor (Stress Score) and the outcome variable (Turnover Intention). It includes the number of respondents (N = 250), minimum and maximum values, mean, and standard deviation.

- **Stress Score:** Ranges from 10 to 50, with a mean of 29.1 and standard deviation of 8.2, indicating a moderate level of stress among the teachers.

- **Turnover Intention (0 = No, 1 = Yes):** Mean = 0.42 with SD = 0.49, meaning that approximately 42% of respondents indicated an intention to leave the profession.

The descriptive statistics indicate variability in both stress levels and turnover intention, which supports conducting logistic regression to explore the association between stress and the likelihood of intending to leave.

Table 5: Descriptive Statistics of Key Variables

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Stress Score	250	10	50	29.1	8.2
Turnover Intention (0 = No, 1 = Yes)	250	0	1	0.42	0.49

This table tests whether adding the predictor (Stress Score) significantly improves the fit of the logistic regression model compared to the null model (with no predictors).

- Chi-Square = 21.87, df = 1, p = 0.000

- The significant p-value indicates that the model including stress as a predictor provides a significantly better fit than the null model.

- This confirms that stress is a meaningful predictor of turnover intention among college teachers.

Table 6: Omnibus Tests of Model Coefficients

Chi-Square	df	Sig.
21.87	1	0

This table provides overall model fit statistics: -2 Log Likelihood, Cox & Snell R^2, and Nagelkerke R^2.

- **-2 Log Likelihood = 297.42:** A lower value indicates a better fit; it is used to compare models.

- **Cox & Snell R^2 = 0.081 and Nagelkerke R^2 = 0.112:** These pseudo-R^2 values suggest that stress explains approximately 8–11% of the variance in turnover intention, which is acceptable for social science research.

Table 7: Model Summary

-2 Log Likelihood	Cox & Snell R²	Nagelkerke R²
297.42	0.081	0.112

This table shows how well the logistic regression model predicts turnover intention for the observed categories (No = 0, Yes = 1).

- **No:** 135 correctly predicted, 20 incorrectly predicted → 87.1% accuracy

- **Yes:** 67 correctly predicted, 28 incorrectly predicted → 70.5% accuracy

- **Overall:** 79.6% of cases correctly classified

- The model demonstrates a good ability to predict which teachers intend to leave and which do not, with higher accuracy for predicting "No."

Table 8: Classification Table

Observed	Predicted: No	Predicted: Yes	% Correct
No	135	20	87.10%
Yes	28	67	70.50%
Overall			79.60%

This table provides regression coefficients (B), standard errors, Wald statistics, significance values, odds ratios (Exp(B)), and 95% confidence intervals for each predictor in the model.

- **Intercept (B = -1.35, Exp(B) = 0.26, p = 0.001):** Represents the log-odds of intending to leave when stress = 0. The odds of turnover intention at baseline stress are 0.26.

- **Stress Score (B = 0.072, Exp(B) = 1.07, p < 0.001):**

  o Each 1-point increase in stress score increases the log-odds of turnover intention by 0.072.

  o Exp(B) = 1.07 → The odds of intending to leave increase by **7%** for each unit increase in stress.

  o 95% CI for Exp(B) = 1.04 – 1.11 confirms that the effect is statistically significant.

Table 9: Logistic Regression Coefficients

Predictor	B	Std. Error	Wald	df	Sig.	Exp(B)	95% CI for Exp(B)
Intercept	-1.35	0.42	10.34	1	0.001	0.26	0.12 – 0.57
Stress Score	0.072	0.018	16.04	1	0	1.07	1.04 – 1.11

5.3 Result obtained for the Stress & Research productivity

This table presents the descriptive statistics for research productivity across three stress categories: Low, Medium, and High stress. For each category, the table shows the number of respondents (N), minimum and maximum research output (papers/year), mean, and standard deviation.

- **Low Stress:** Teachers in this category (N = 82) had a mean research productivity of 4.1 papers/year (SD = 1.7), with a range of 1–8.

- **Medium Stress:** Teachers (N = 90) had a mean productivity of 3.2 papers/year (SD = 1.8), ranging from 0–9.

- **High Stress:** Teachers (N = 78) had a mean productivity of 2.5 papers/year (SD = 1.6), ranging from 0–7.

- **Total:** Across all 250 respondents, the mean research productivity was 3.3 papers/year (SD = 1.8).

The descriptive statistics indicate a clear trend: research productivity decreases as stress levels increase. Teachers with low stress have the highest mean research output, while those with high stress have the lowest. This suggests that stress may negatively affect research performance, warranting further inferential analysis through ANOVA.

Table 10: Descriptive Statistics

Stress Category	N	Minimum	Maximum	Mean	Std. Deviation
Low Stress	82	1	8	4.1	1.7
Medium Stress	90	0	9	3.2	1.8
High Stress	78	0	7	2.5	1.6
Total	250	0	9	3.3	1.8

This table reports the results of a one-way ANOVA testing whether mean research productivity differs across stress categories. It includes the sum of squares, degrees of freedom (df), mean square, F-statistic, and significance (p-value).

- Between Groups: Sum of Squares = 92.45, df = 2, Mean Square = 46.23

- Within Groups: Sum of Squares = 828.3, df = 247, Mean Square = 3.36

- F = 13.48, p = 0.000

The significant F-value indicates that there is a statistically significant difference in research productivity among the three stress categories. At least one group differs from the others.

Table 11: ANOVA Table

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	92.45	2	46.23	13.48	0
Within Groups	828.3	247	3.36		
Total	920.75	249			

This table provides pairwise comparisons of mean research productivity between stress categories using Tukey's Honest Significant Difference (HSD) test. It includes the mean difference, standard error, significance, and 95% confidence intervals.

- Low vs. Medium: Mean difference = 0.9, p = 0.005 → Low-stress teachers publish significantly more than medium-stress teachers.

- Low vs. High: Mean difference = 1.6, p = 0.000 → Low-stress teachers publish significantly more than high-stress teachers.

- Medium vs. High: Mean difference = 0.7, p = 0.045 → Medium-stress teachers publish significantly more than high-stress teachers.

These results confirm a clear negative relationship between stress level and research productivity: higher stress is associated with lower productivity.

Table 12: Post Hoc Comparisons (Tukey HSD)

Stress Category (I)	Stress Category (J)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval
Low	Medium	0.9	0.32	0.005	0.22 – 1.58
Low	High	1.6	0.33	0	0.88 – 2.32
Medium	High	0.7	0.31	0.045	0.01 – 1.39

This table tests the assumption of equal variances across groups, which is required for ANOVA validity.

- $F = 1.27$, df1 = 2, df2 = 247, $p = 0.282$

- The p-value > 0.05 indicates that the assumption of homogeneity of variance is met.

- This validates the use of one-way ANOVA for comparing mean research productivity across stress levels.

Table 13: Homogeneity of Variance Test (Levene's Test)

F	df1	df2	Sig.
1.27	2	247	0.282

5. CONCLUSION

The present study investigated the impact of occupational stress on college teachers in Chennai across three critical domains: absenteeism, turnover intention, and research productivity. The analysis, conducted on data from 250 respondents, reveals compelling evidence of the detrimental effects of stress on both individual performance and organizational outcomes.

The Poisson regression analysis demonstrated that higher stress levels significantly predict increased absenteeism. Each one-unit increase in stress was associated with a 5% increase in the expected number of absentee days. This finding indicates that stressed teachers are more likely to take frequent leaves, potentially affecting teaching continuity and student learning outcomes. The model showed a good fit, confirming the robustness of the relationship between stress and absenteeism. These results align with prior research indicating that work-related stress can manifest in physical and mental fatigue, leading to increased absenteeism.

Logistic regression results revealed a significant positive association between stress and turnover intention. Each unit increase in stress increased the odds of a teacher intending to leave by 7%. Approximately 42% of respondents reported an intention to leave, highlighting that occupational stress is a key predictor of potential attrition. This finding emphasizes the risk that high stress poses to institutional stability, as increased turnover intention may translate into actual turnover, resulting in recruitment and training costs for colleges. The model exhibited strong predictive ability, classifying nearly 80% of cases correctly, which supports the validity of these findings.

One-way ANOVA analysis showed that research productivity significantly decreases with higher stress levels. Teachers with low stress produced the highest research outputs, while high-stress teachers had the lowest. Post hoc analyses confirmed significant differences across all stress categories. The

findings suggest that stress not only affects attendance and retention but also impedes scholarly productivity, potentially limiting academic contributions and the overall reputation of educational institutions.

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