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Relationship between Occupational Stress and Resilience among Mathematics Teachers of Higher Secondary Schools in Kerala

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ABSTRACT: Today, teachers face a multitude of problems related to student issues, job-related concerns, and complications in the teaching, learning, and evaluation processes. In addition to these profession-related problems, they naturally have to manage their personal and familial concerns. In such situations, there is a significant possibility of deterioration in the mental health of teachers. Since mathematics is considered a difficult subject by many, teachers who deal with this subject often face additional hardships in their profession. In higher secondary schools, where students are adolescents, the situation becomes even more challenging. Therefore, the mental health of teachers is of high concern and should be frequently monitored. The present study attempts to explore the relationship between occupational stress and resilience, a protective factor against mental health issues (Vergara et al., 2024), among mathematics teachers in higher secondary schools in the state of Kerala, India, surveying a random sample of 150 teachers. Pearson's correlation analysis of the data reveals a moderate level of relationship between occupational stress and resilience among teachers, emphasizing the need to employ strategies that increase resilience levels, thereby mitigating occupational stress.

KEYWORDS: Occupational Stress, Resilience

I. INTRODUCTION

Occupational stress is widely recognized as a significant contributor to the decline in mental health, which, in turn, can have a detrimental impact on physical well-being. In particular, those in high-demand professions, such as teaching, often face unique and persistent stressors that can negatively affect their overall mental health. Teachers, in particular, experience a wide range of challenges in their day-to-day work that can lead to burnout, anxiety, and depression. These challenges include heavy workloads (Kaur & Kumar, 2017; Katel, 2023), long hours (Bannai et al., 2015), time pressure (Aldrup et al., 2017), position in the workplace (Agai-Demjaha et al., 2015) and job insecurity (Katel, 2023). Dealing with difficult students or parents, the pressure to meet educational standards, and the constant emotional labour involved in supporting and guiding students are additional burden to teachers. The accumulation of these stressors not only has an adverse effect on their mental health but can also manifest physically, contributing to issues like fatigue, sleep disturbances, and chronic illnesses. The complex and multifaceted nature of these stressors highlights the need for more attention to the mental well-being of teachers, as their ability to maintain a healthy balance is essential not only for their own health but also for the quality of education they provide. Stress and burnout remain widespread issues for teachers globally, contributing to anxiety and depression (Agyapong et al., 2022).

The workload for mathematics teachers grows over time. To stay competitive in the 21st century, they must excel in both mathematical expertise and effective pedagogical and technological skills (Jian et al., 2022). For mathematics teachers in higher secondary schools, the pressure and stress are often amplified due to the nature of the subject and the expectations placed on them. Mathematics, being a subject that many students find challenging, requires teachers to employ not only effective teaching strategies but also emotional and psychological support to help students overcome their difficulties. The responsibility of ensuring that students grasp complex concepts, prepare for examinations, and succeed academically can be overwhelming. In addition to the standard workload, math teachers often face the challenge of managing students' anxiety around the subject.

Furthermore, the increasing reliance on standardized testing and the pressure to meet specific academic targets adds to the stress (Spoelman-DeLong, 2023). Math teachers often find themselves balancing lesson planning, grading,



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and assessment in ways that leave little time for self-care or professional development. This intense focus on measurable outcomes can lead to feelings of inadequacy or burnout when students do not meet expectations, despite the teacher's best efforts. The lack of sufficient support and recognition for the emotional and intellectual labour involved in teaching mathematics also contributes to stress. While teaching is often seen as a noble profession, psychological impact, particularly for math teachers who are tasked with guiding students through one of the most anxiety-inducing subjects, is frequently unnoticed. The result is a cycle of stress that impacts not only the teacher's mental and physical health but also their ability to create a positive and effective learning environment.

Resilience

Resilience plays a decisive role in helping teachers address the stress and challenges of their profession. It is the ability to effectively cope with and overcome difficult or challenging life experiences, particularly by demonstrating mental, emotional, and behavioral flexibility in response to both external and internal pressures (American Psychological Association, n.d.). Resilience encompasses a range of personal traits, including optimism, adaptability, and emotional control, which enables individuals to manage stress and overcome challenges. For teachers, this quality can be a significant advantage in managing the day-to-day pressures of their roles, as well as in dealing with the emotional and intellectual demands of teaching. Resilience, or the ability to recover from setbacks, is not merely an inborn characteristic but a skill that can be developed and enhanced with time (Kutsyuruba et al., 2019).

Resilient teachers exhibit three key practices that help them thrive in challenging times: reflection, boundarysetting, and alignment with core values (Aguilar, 2021). Reflecting on their experiences and emotions allows teachers to gain insights, clarify their priorities, and make decisions that align with their core values. Setting boundaries is essential to prevent burnout, ensuring that teachers protect their personal and professional energy. Finally, resilient teachers are clear on what matters most to them, allowing them to make decisions with confidence and purpose, even in uncertain circumstances. By prioritizing reflection, establishing boundaries, and staying aligned with their values, educators can address obstacles more effectively, and create a more fulfilling professional experience. As the world and educational environments continue to evolve, these practices help teachers grow and adapt, ensuring long-term wellbeing and success. Resilience can be advantageous for teachers in many ways:

- 1. Emotional Regulation and Coping with Stress:
- 2. Maintaining a Positive Outlook
- **3. Adapting to Change and Innovation**
- 4. Building Stronger Relationships with Students
- 5. Improving Professional Well-Being

STATEMENT OF THE PROBLEM

The aforementioned studies indicate that occupational stress remains a significant challenge for teachers worldwide, affecting their well-being and performance. To mitigate its negative impact, a combination of individual self-care strategies, organizational support, and systemic changes is essential, as highlighted by various studies that emphasize the importance of resilience-building interventions and a supportive work environment. The problem addressed in this study is the exploration of the relationship between occupational stress and resilience among mathematics teachers in higher secondary schools in Kerala. Despite the growing recognition of stress in the teaching profession and its potential impact on teacher performance and well-being, there is limited research specifically focusing on mathematics teachers at the higher secondary level in Kerala. This study seeks to investigate how occupational stress influences the resilience of these educators, and whether fostering resilience can help mitigate the adverse effects of stress, ultimately enhancing their professional effectiveness and personal well-being. We hypothesize that higher levels of resilience will be inversely related to the occupational stress experienced by teachers.

HYPOTHESES

- 1. The level of occupational stress of Mathematics teachers in higher secondary schools in Kerala is moderate.
- 2. The level of resilience of Mathematics teachers in higher secondary schools in Kerala is moderate.
- 3. There is a significant relationship between occupational stress and resilience among mathematics teachers in higher secondary schools in Kerala.



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METHOD

Research Design: The study employed a descriptive-correlational research design, which aims to assess the levels of occupational stress and resilience among mathematics teachers in higher secondary schools in Kerala and to explore the relationship between these two variables.

Population and Sample: The population for this study consist of mathematics teachers from various higher secondary schools in Kerala. For conducting the survey, a sample of 150 teachers was selected from Kollam district of Kerala state employing random sampling technique.

Data Collection Tools

1. Occupational Stress Scale

Current study adopted a standardised Teachers' Occupational Stress Scale constructed by Meenakshi Sharma and Satvinderpal Kaur (2014) to assess the occupational stress of higher secondary school teachers. The scale consists of 30 items divided into nine dimensions: workload, role ambiguity, groupism and external pressure, responsibility, powerlessness, work relationships, working conditions, personal inadequacy, and lack of motivation. It uses a five-point response format and has good reliability (.801) and validity, including significant correlation with a similar tool. The total score ranges from 30 to 150, indicating varying levels of occupational stress, with norms provided to categorize stress levels from extremely low to extremely high.

2. Resilience Scale

The Resilience Scale, developed by Chandra Kumari and Akrati Yadav (2019), employed in the current study is a 34-item Likert-type scale designed to measure the resilience of teachers in higher secondary schools. It includes both positive and negative statements, with responses ranging from Strongly Agree to Strongly Disagree. The scale's reliability has been established through multiple methods, including split-half, Cronbach's alpha (.99), and test-retest (.99) methods, indicating strong internal consistency and reliability. The scale also demonstrates good construct validity, confirmed by expert evaluation and convergent validity with another established resilience measure. For this scale scores range from 34 to 170, with higher scores indicating greater resilience. Norms for interpretation categorize resilience levels into grades ranging from Extremely Low to Extremely High.

Procedure for Collection of Data: The research tools were distributed to the selected mathematics teachers after obtaining informed consent from each participant, ensuring confidentiality and voluntary participation.

Data Analysis: Descriptive statistics, including the mean and standard deviation, were calculated to determine the levels of occupational stress and resilience among the teachers. To examine the relationship between occupational stress and resilience, Pearson's correlation coefficient was computed, allowing for the identification of any significant correlation between these two variables.

II. RESULTS AND DISCUSSION

1. Occupational stress experienced by mathematics teachers in higher secondary schools

The data analysis shows that the arithmetic mean for the occupational stress scores of the 150 teachers who participated in the survey is 91.19, with a standard deviation of 15.97. These values indicate a moderate level of occupational stress, as the mean score lies above the mid-value (90) of the scale. Based on the z scores, the participants were categorized into experiencing extremely high (A), high (B), above average (C), average/moderate (D), below average (E), low (F), and extremely low (G) occupational stress based on their occupational stress scores as outlined in the scale manual (Sharma & Kaur, 2014). The categorization of mathematics teachers based on occupational stress scores are presented in the table 1.

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Categorization of Mathematics Teachers Based on Occupational Stress Level					
Sl. No.	Range of z scores	Grade	Level of Occupational Stress	Number	%
1	+2.01 and above	А	Extremely high	0	0%
2	+1.26 to +2.00	В	High	10	7%
3	+0.51 to +1.25	С	Above average	47	31%
4	-0.50 to +0.50	D	Average/moderate	43	29%
5	-1.25 to -0.51	Е	Below average	34	23%
6	-2.00 to -1.26	F	Low	13	9%
7	-2.01 and below	G	Extremely low	3	2%

Table 1

The categorization of mathematics teachers based on occupational stress levels shows that a significant percentage of teachers (31% and 29%) experience moderate to above-average stress, while only a small percentage (7% and 2%) report extremely high or extremely low stress levels. The findings of the current study align with the trends observed in various previous studies. The majority of teachers (60%) in the present study fell within the average to above-average stress categories, reflecting a moderate to high stress level that is consistent with the findings of Carroll et al. (2022), who reported high stress levels in more than half of Australian teachers. The findings reported by Rani (2023) and Pendharkar (2024) are similar to those of the present study, suggesting that mathematics teachers experience considerable stress. Since a significant number of teachers are experiencing moderate stress, strategies addressing stress management, as suggested by Mahalakshmi (2022) and Naik (2024), appear crucial in enhancing both teacher well-being and professional performance.

2. Resilience among mathematics teachers in higher secondary schools

From the analysis, it was revealed that the arithmetic mean of the resilience scores of the sample of teachers is 128.90, with a standard deviation of 11.49. The mean score indicates a moderate to high level of resilience among higher secondary school teachers, as it exceeds the middle score (102) of the Resilience Scale. The teachers were categorized into extremely high (A), high (B), above average (C), average/moderate (D), below average (E), low (F), and extremely low (G) resilience groups based on their resilience scores, in accordance with the scale manual (Kumari & Yadav, 2019). The raw scores were converted to z-scores, and based on the ranges given in the scale manual, the mathematics teachers were grouped into A, B, C, D, E, F, and G categories. The categorization of mathematics teachers based on resilience scores is presented in Table 2.

Sl.	Range of z scores	Grade	Level of	Number	%
No.	Tunge of 2 Secres	Grude	Resilience	T turno er	70
1	+2.01 and above	А	Extremely high	5	3.33%
2	+1.26 to +2.00	В	High	9	6.00%
3	+0.51 to +1.25	С	Above average	30	20.00%
4	-0.50 to +0.50	D	Average/moderate	62	41.33%
5	-1.25 to -0.51	Е	Below average	28	18.67%
6	-2.00 to -1.26	F	Low	12	8.00%
7	-2.01 and below	G	Extremely low	4	2.67%

 Table 2

 Categorization of Mathematics Teachers Based on Resilience Level

The categorization of mathematics teachers based on their resilience levels shows a diverse distribution across different resilience levels. The majority of teachers (41.33%) fall into the 'average/moderate' resilience category (D), signifying that most teachers possess a moderate level of resilience. Following that, 20% of teachers exhibits an 'above average'



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level of resilience (C), and 6% show a 'high' level of resilience (B). Only a small percentage of teachers demonstrate 'extremely high' resilience (3.33%). On the other hand, a notable portion of teachers, 18.67%, fall into the 'below average' category (E), and 8% exhibit 'low' resilience (F). A very small percentage (2.67%) of teachers falls into the 'extremely low' resilience category (G).

The categorization of mathematics teachers based on resilience levels indicates that a significant number of teachers (41.33%) fall into the 'average/moderate' resilience category, reflecting a typical level of adaptability to stress and challenges. This finding resonates with recent studies explores the various factors influencing teacher resilience (Rajeswari & Prakasha, 2024; Marquez & Ching, 2023; Arunima & Joseph, 2023). These findings suggest that while most teachers in the present study demonstrate moderate level of resilience, there is a clear need for continued efforts to foster resilience, particularly through emotional and social support, training, and organizational backing, as outlined in previous studies.

3. Relationship between occupational stress and resilience among mathematics teachers

The occupational stress scores and resilience scores of mathematics teachers were subjected to Pearson's product-moment correlation analysis. Table 3 presents the data related to Pearson's test.

Table 3
Relationship between Occupational Stress Scores and Resilience Scores of Mathematics Teachers (N= 150)

Variables correlated	r	t _r	SEr	Confidence interval	
				Lower	Upper
Occupational Stress Vs.					
Resilience	534	7.683	.058	383	685

The coefficient of correlation between the occupational stress scores and resilience scores of mathematics teachers is -.534. This value is much greater than the table value (.208 at 148 degrees of freedom) required for a significant relationship at the .01 level (Garrett, 1966, p. 201). Furthermore, the obtained 't_r' value (7.683) is greater than the table value (2.58) at the .01 level of significance. Therefore, the obtained correlation is significant at the .01 level (Best & Kahn, 2011). It is also noted that the 99% confidence interval for the coefficient of correlation ranges from -.685 to -.383. Since this interval does not contain zero, it further supports the conclusion that the relationship is statistically significant. The value of r is in between -.4 and -.7, the relationship is substantial (Garrett, 1966, p. 176). Hence it can be understood that there is a significant moderate negative correlation between occupational stress and resilience among mathematics teachers of higher secondary schools. This indicates that higher occupational stress is associated with lower resilience.

The significant moderate negative correlation between occupational stress and resilience among higher secondary school mathematics teachers, as identified in this study, aligns with findings from recent research both internationally and within India. Arunima and Joseph (2023) found that resilience was positively correlated with wellbeing and negatively correlated with emotional exhaustion. Research by Rajeswari and Prakasha (2024) reinforces the negative association between perceived stress and resilience. Similarly As reported by Cho et al. (2021), resilience can mediate the negative effects of stress, which highlights the need for systemic support to enable teachers to build resilience and manage their stress more effectively. The relationship between occupational stress and resilience observed in this study is consistent with global trends that emphasize the importance of addressing teacher stress through fostering resilience.

III. CONCLUSION

The negative correlation between occupational stress and resilience suggests that as teachers possess higher levels of resilience, their occupational stress tends to decrease. This pattern highlights the need to cultivate resilience in order to mitigate the detrimental effects of stress on their well-being and professional performance. Resilience, defined



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as the capacity to recover from challenges, is not merely an inherent characteristic but a skill that can be developed and enhanced over time (Kutsyuruba et al., 2019). Therefore, interventions aimed at enhancing resilience could prove to be beneficial. Resilience can be strengthened through professional development and support networks that equip teachers with the skills and resources necessary to manage stress effectively (Squires et al., 2022). They argue that professional development and support networks are essential for building resilience in teachers, emphasizing their role in enhancing well-being, managing stress, and promoting a positive and sustainable teaching experience. Some practical steps for enhancing resilience among teachers are:

- 1. Mindfulness and Stress Management
- 2. Professional Learning
- 3. Self-Care

By adopting and promoting resilience practices, teachers can foster a positive and supportive learning environment (Kutsyuruba et al., 2019). Through mindful practices, on-going professional development, and a focus on self-care, resilience can be nurtured and woven into daily routines, resulting in a more rewarding and effective educational experience for both teachers and students.

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