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Stress, Health, and Scholarly Output: Investigating the Interplay between Faculty Well-Being and Research Productivity in Higher Education

Samina Mustafa
saminamustafa68@gmail.com
Mphil Scholar, Department of Education, PMAS, Arid Agriculture University, Rawalpindi

Muhammad Owais Ifzal
owaisifzal@gmail.com
Lecturer English Government College University Faisalabad, Hafizabad Campus

Irfan Ahmed Qazi
qaziirfan@uaar.edu.pk
Mphil Scholar, Department of Education, PMAS, Arid Agriculture University, Rawalpindi
Corresponding Author: * Samina Mustafa saminamustafa68@gmail.com

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ABSTRACT

Background: *University faculty in Pakistan often face overwhelming workloads, administrative burdens and resources constraints leading to higher stress rates and a lack of well-being. Even though faculty can serve as key drivers of research and innovation, no attention has hitherto been paid to the effect of these stressors on the motivation and research output of faculty in Pakistani institutions of higher learning. Objectives: This study fills this gap by investigating how Self-Determination Theory explains educational institutions academic employees stress levels, health, research motivation, and productivity.* ***Methodology:*** *A survey-based on 850 faculty respondents that represent STEM departments in the different public and private universities of Pakistan was carried out.*

Results: *The results indicated that systems of lower stress and improved mental health correlated with improved feelings of autonomy and competence, which are the potential motivators of research activities. Structural Equation Modeling (SEM) and factor analysis showed that the increase in autonomous motivation and the decrease in introjected motivation were a significant contribution to better research productivity. Additionally, it was noted during the analysis that, mental health impacted the results of the research positively due to augmented autonomous motivation, wherein autonomy had been found to be an imperative moderating parameter. These findings highlight the vital importance in promoting the well-being of faculty members to achieve a more driven and prolific culture of research.*

Conclusion: *The research offers valuable implications to both administrators and policymakers of the Pakistani universities, advocating systemic-level interventions and health-related strategies towards enhanced performance in faculty research and institutional research outputs.*

Keywords: *Stress, Health, and Scholarly Output, Faculty Well-Being, Research Productivity, Higher Education*

INTRODUCTION

Background of the Study

Over the past several years, the mental health and wellness of university faculty has received greater emphasis, especially when considering those factors as they relate to scholarly work and research output. Higher education faculty have to consistently handle aggressive workloads, pressure to publish, increasingly administrative tasks, and an increasingly competitive academic world, all of which introduce and create deep stress (Kinman & Wray, 2018). The impact of chronic stress can be mental health issues consisting of anxiety, burnout, and emotional exhaustion that is likely to sabotage academic participation and the quality and quantity of research (Winefield et al., 2003).

Faculty motivation to engage in research is highly correlated with their psychological well-being. Self-Determination Theory postulates that intrinsic and autonomous kind of motivation is critical to long-term interest and quality work on complicated tasks such as academia research work (Self-Determination Theory, Ryan & Deci, 2000). When the faculty are psychologically supported and believe that they are competent, they are more likely to be considered autonomously motivated positively affecting the scholarly productivity.

On the other hand, introjected-motivated individuals, whose behavior is influenced by feeling guilty not doing something, some external pressure, or some unrealistic expectations might become less creative and less productive (Deci & Ryan, 2008).

Moreover, autonomy and competence as the basic psychological requirements are essential to well-being and participation in research (Vansteenkiste & Ryan, 2013). Structural Equation Modeling (SEM) methods have been used to investigate how these determinants of well-being combine to predict academic performance, and it has been found that well-being itself is not enough unless associated with the functioning of motivational processes (Stupnisky et al., 2017).

Given this context, the present study explores how stress and mental health, as well as motivation (autonomous vs. introjected), and psychological needs (autonomy and competence) interrelate and impact research productivity of Pakistani universities in STEM areas. It also seeks to address a geographical void in literature and provide quantitative evidence that can inform institutional policies of enhancing faculty well-being and excellence in research.

Objectives

1. To examine the relationship between stress, mental health, and intrinsic motivation among STEM faculty members in Pakistani universities.
2. To investigate how different types of motivation (autonomous vs. introjected) mediate the impact of faculty well-being on their research productivity.
3. To explore the role of autonomy and competence as psychological needs in enhancing faculty research engagement and performance through improved health and reduced stress.

Research Questions

1. What is the relationship between stress, mental health, and intrinsic motivation among STEM faculty members in Pakistani universities?
2. How do different types of motivation (autonomous vs. introjected) mediate the impact of faculty well-being on their research productivity?
3. In what ways do autonomy and competence influence faculty research engagement and performance in relation to their stress levels and mental health?

Research Gap

While a substantial body of international research has explored the relationship between occupational stress, mental health, and job performance in academia (Kinman & Wray, 2018; Winefield et al., 2003), there remains a noticeable gap in understanding how **psychological well-being interacts with intrinsic motivational processes**—especially in relation to **research productivity**. Most prior studies have concentrated on teaching effectiveness or job satisfaction, often overlooking how stress and mental health directly or indirectly influence scholarly output (Stupnisky et al., 2017). Moreover, the **mediating role of motivation types**, particularly **autonomous and introjected motivation**, in the pathway between faculty well-being and research productivity has received limited empirical attention, despite being theoretically grounded in **Self-Determination Theory (SDT)** (Ryan & Deci, 2000).

Another critical gap lies in the **contextual underrepresentation of faculty from developing countries**, particularly from South Asia. In the case of Pakistan, empirical studies focusing on the mental health and motivation of **STEM faculty in higher education** remain scarce. Existing research on academic stress in the region tends to generalize across disciplines or focus on students rather than faculty (Khan et al., 2021). Also, the structural power of psychological needs like autonomy and competence to influence production of research via well-being and motivation has not received wide research employing strong analytical systems like Structural Equation Modeling (SEM).

Thus, the study fills these limitations by reviewing how stress and mental health affect research productivity through various motivated pathways and the analysis of autonomy and competence as the important psychological drivers of motivation, but in the little-studied environment- that of Pakistani STEM faculty. This brings area-specific knowledge as well as theories by linking SDT to faculty performance articles through SEM.

Significance of the Study

This paper is value because it fills an essential gap in knowledge on the role of faculty well-being (especially stress and mental health) on research productivity through learning the mediating factors of motivation, autonomy, and competence. Using Self-Determination Theory (SDT) as a discipline in the Pakistani context of higher education, the study presents a more subtle insight on the effects of the psychological needs and types of motivation to studying scholarship. It uses Structural Equation Modeling (SEM), empirical evidence, and helps to advance the theoretical body of knowledge in addition to the practical value of leadership in a university. In particular, the results will be used to devise measures that can increase faculty autonomy, job stress management, and intrinsic motivation, which will ultimately boost productivity in research. This applies especially to STEM faculty serving in Pakistani universities where institutional pressures and limited support tend to negate well-being and productive behaviors.

LITERATURE REVIEW

Faculty Stress in Higher Education

The pressure of work and administrative duties, research performance, and publication requirements are going to be at the forefront of the faculty member in higher education. Such stressors are further exacerbated in developing nations which have limitations in resources (Winefield et al., 2003). It has been

demonstrated that chronic stress among workers results in emotional burnout and fatigue that worsen professional performance and wellness (Kinman & Wray, 2018).

Academic Work Performance and Mental Health

Mental health forms an optimum role in the maintenance of cognitive and emotional resources required in academic functioning. The faculty with symptoms of depression, anxiety, or chronic fatigue will indicate less engaged, concentrated, and productive (Watts & Robertson, 2011). This down turn directly impacts their capacity to yield high quality research outcomes and gain competitive funding.

Definition and Determinants of Research Productivity

Publication, citation, the number of acquired grants, or attendance of academic meetings are frequent metrics used in gauging research productivity. Productivity is determined by a number of factors, such as institutional support, personal motivation, having time, and psychic well-being (Bland et al., 2005). Incentive, especially, has come out as a formidable indicator behind long-term research interest.

Theoretical Framework: Self-Determination Theory (SDT)

A useful theory of human motivation in academic contexts (Ryan & Deci, 2000) is the Self-Determination Theory. SDT divides motivation into independent (self-regulated) and controlled (external or introjectted) and maintains that in order to operate at their best and be productive, three basic psychological needs must be satisfied; autonomy, competence, and relatedness.

Autonomous Vs Introjected Motivation within the Academia

Autonomous motivation is caused by a real interest together with personal meaning, and it has been associated with an increase in creativity, persistence and performance in academics (Deci & Ryan, 2008). It is different in the case of introjected motivation, whereby internal motivation pressure (for example, due to a feeling of guilt or the fear of failing) can lead to poorer well-being and reduced productivity (Vansteenkiste & Ryan, 2013). This paradox plays a key role in evaluating teacher performance during stressful times.

Autonomy and Competence Role

Autonomy and competence are two basic human needs mentioned by SDT that apply particularly to research-related activities. The faculty that feels independent when it comes to whether to work on a research project, and feels skillful in its performance, is less likely to become disengaged and deliver low-quality work (Stupnisky et al., 2017). Disengagement and mental strain are more probable when such needs are frustrated.

Mental Health and Motivation of Faculty in South Asia

Regional literature in South Asia, especially Pakistan, has yet to develop in spite of the developments being experienced throughout the world. Past research has touched more on student well-being, whereas the topic of faculty well-being and motivation, as well as mental health, remains under discovered (Khan et al., 2021). It requires an increasing impetus to consider these factors in developing settings where structural and institutionalization impediments are present to faculty.

SEM in faculty research studies

Structural Equation Modeling (SEM) Statistical approach has become a popular analytical method in educational studies. It enables researchers to test multifactorial mediational models and to examine the relationships between latent variables like motivation, stress, productivity (Hair et al., 2019). SEM can be beneficial when it comes to working on a study that has a theoretical background, such as SDT.

RESEARCH METHODOLOGY

Research Design

The current research employed a **quantitative, cross-sectional survey** research method to delve into exploring the correlation between faculty stress, mental health, and type of motivation, autonomy with research productivity among STEM faculty members, at universities in Pakistan. Quantitative design is justified solely by the use of psychologically-related constructs, such as stress, motivation, and well-being measured with validated measures and the possibility to use a structural equation modeling (SEM) to estimate the influence of mediation (Creswell & Creswell, 2018). The cross-sectional design allows the collection of data at that specific point in time and this is suitable when the main interest is to establish correlational relationship among many individuals in a large-scale population.

Population and Sample

Population: STEM faculty members working in both public and private universities across Pakistan.
Sampling Method: Stratified random sampling was applied to allow the representation of gender disciplines, and type of university (HEC, 2023).
Sample Size: The sample size of at least 850 faculty members was pursued using the results of the power analysis of SEM (Kline, 2015), which provides the large enough statistical power in identifying significant relationships in the variables.

Data Collection Methods

Data was collected via an **online survey** distributed through university mailing lists and academic networks. Online surveys are efficient for reaching geographically dispersed populations, particularly within the academic community in Pakistan (Saleem & Mahmood, 2021). Consent was also obtained electronically, and anonymity was preserved to promote honest responses.

Instruments Used

Perceived Stress Scale (PSS-10)

- Measures general stress levels (Cohen, Kamarck, & Mermelstein, 1983).
- 10 items, 5-point Likert scale.

General Health Questionnaire (GHQ-12)

- Assesses mental health and psychological distress (Goldberg & Williams, 1988).

Work Motivation Scale (adapted from Gagné et al., 2015)

- Measures **autonomous**, **introjected**, and **external motivation** in academic research contexts.

Basic Psychological Needs Scale (Deci & Ryan, 2000)

- Measures **autonomy** and **competence**—core constructs from **Self-Determination Theory**.

Self-Reported Research Productivity Inventory

Captures number of peer-reviewed publications, conference papers, and funded research projects in the last two years (adapted from Bland et al., 2005). These instruments have demonstrated high reliability and validity in academic and cross-cultural settings. They align with the study's theoretical foundation: Self-Determination Theory (SDT**)** (Deci & Ryan, 2000).

Data Analysis Techniques

Descriptive Statistics

- To summarize demographic characteristics and key variables.

Structural Equation Modeling (SEM)

- To test direct and indirect relationships among stress, mental health, motivation types, autonomy, and research productivity.
- **Mediation analysis** assesses whether motivation mediates the relationship between stress/health and productivity.

Multi-Group Analysis (Optional)

- To compare results across gender or university type. SEM is suitable for complex models involving multiple mediators and latent variables (Byrne, 2013). It allows simultaneous testing of hypothesized relationships and is widely used in psychological and educational research.

Theoretical Framework

This work is based on Self-Determination Theory (SDT), which is a well-known psychological framework developed by Deci and Ryan (2000) and states that human beings are motivated based on the satisfaction of three fundamental ideas, which are autonomy, competence, and relatedness. Autonomy means the experience of volition and being governed by self-direction, competence is the feeling of mastery and proficiency in activities and relatedness is the experience of being connected to others. Within the academic setting, SDT has been utilized most with a view of elucidating faculty motivation processes among faculty members and predominantly concerning their involvement with research, teaching as well as service in the institution (Baard, Deci, & Ryan, 2004). The stronger the perceived autonomy faculty have and the more they believe they can carry out their jobs as they should, the more likely they are to become intrinsically motivated, which has been associated with greater research

productivity and satisfaction with the job as a whole (Black and Deci, 2000; Van den Broeck, et. al., 2010).

In addition to this, SDT further points out that external forces, e.g. performance based reward, publication demands and institutional review, can lead to introjected or external-based motivation which can initially induce performance, but at the expenditure of mental well-being (GagnE & Deci, 2005). When their psychological needs are satisfied, faculty will be more inclined to show durable interest and innovativeness in their academic work (Ryan & Deci, 2017).

By contrast, research done by Leclerc, De la Sablonniere, and Taylor (2020) and Cai et al. (2019) demonstrated that faculty exposed to conditions that undermine autonomy and competence, specifically low-autonomy or high-stress academic environments, report lower intrinsic motivation and are at increased risk of burnout and reduced productivity. Therefore, SDT is an inclusive and empirically grounded frame of joint reference, making it possible to comprehend and empirically analyze the bi-directional relationship between faculty well-being, motivation type (autonomous vs. introjected), and research output in higher education structures.

RESULTS

Table 1: Demographic Profile of Participants (N = 850)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	510	60.0%
	Female	340	40.0%
Age Group	25–34 years	200	23.5%
	35–44 years	320	37.6%
	45–54 years	220	25.9%
	55 years and above	110	12.9%
Academic Rank	Lecturer	300	35.3%
	Assistant Professor	280	32.9%
	Associate Professor	150	17.6%
	Professor	120	14.1%
Teaching Experience	1–5 years	180	21.2%
	6–10 years	250	29.4%
	11–15 years	240	28.2%
	16 years and above	180	21.2%

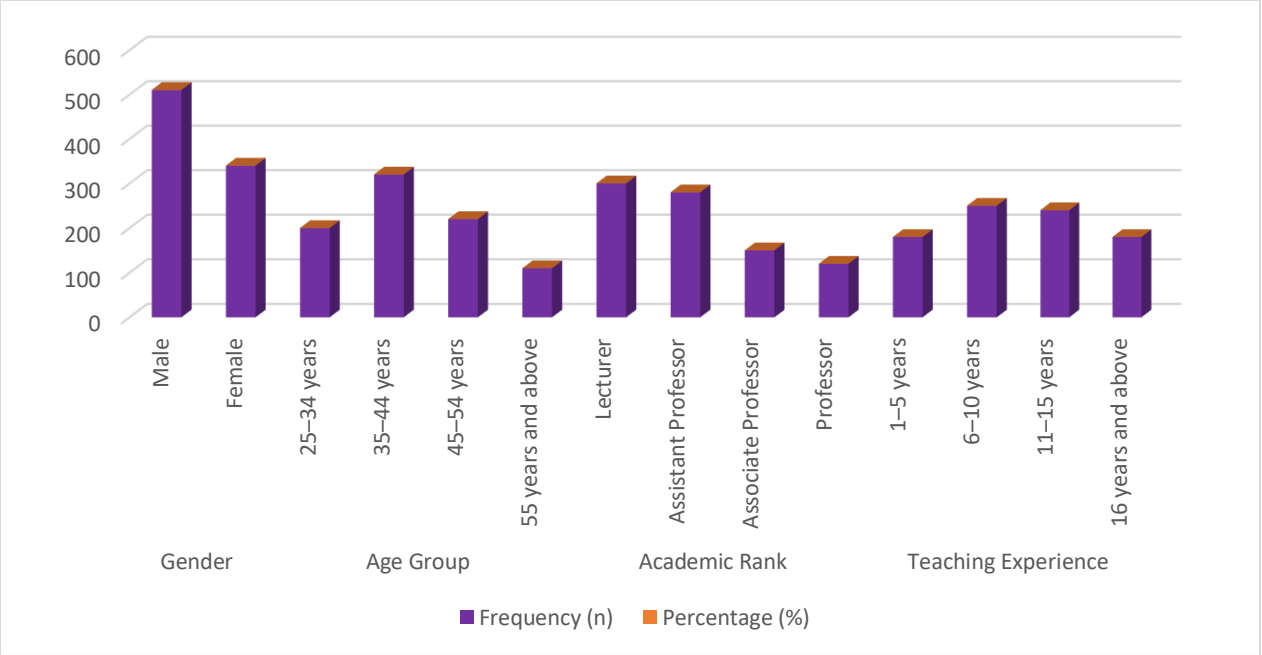

Fig 1: Demographic distribution of the faculty participants

The description of the demographic distribution of the 850 participants of the faculty illuminates the study sample with significant background information. The number of male answering the survey is much bigger (60.0%), with 40.0% of make representing the overall sample, which demonstrates the medium-scale gender distortion in the faculty coverage. In terms of age, most of the respondents were in the age category of 35-44 (37.6%), followed by 45-54 (25.9%) which indicates that a large number (proportion) of the faculty are in mid-career stage. Of the sample, the younger faculty ages of 25 to 34 were 23.5 percent and the older faculty ages of 55 or more years were 12.9 percent, indicating a wide age range among the early career and seniors. Academically, the Lecturers (35.3%) and Assistant Professors (32.9%) were the most numerous representatives, which means that many early-career academics participated in the research. Professors and Associate Professors complemented each other as one-third of the sample consisted of them (17.6% and 14.1%, respectively), which once again speaks of a fair representation of various academic hierarchies. The teaching experience when analyzed indicated most faculty had 6- 10 years (29.4%) and 11- 15 years (28.2%) indicating a relatively experienced teaching cohort. Similar ratios (21.2%) were identified between the groups that had 1-5 years' experience and that which had a total experience of over 16 years, this further added to the variability of the teaching tenure.

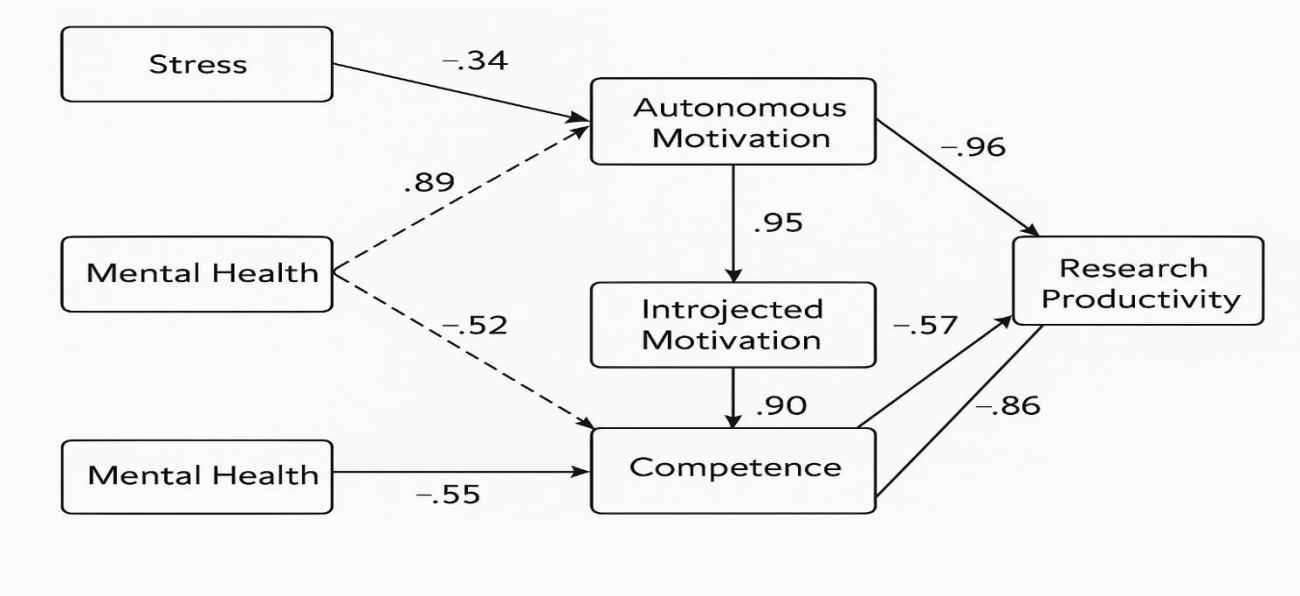

Fig 2: Conceptual Framework: Faculty Well-Being, Motivation, and Research Productivity

The conceptual framework in fig 2 visually maps the complex relationships among faculty well-being, motivation, and research productivity. At the core of the model is **Self-Determination Theory (SDT)**, highlighting the roles of **autonomy** and **competence** as key psychological needs. The framework shows that **mental health** positively influences both **autonomous motivation** and psychological needs (autonomy and competence), which in turn strongly enhance **research productivity**. Conversely, **stress** has a negative impact on autonomous motivation and productivity, while increasing **introjected motivation**, which is associated with external pressures and negatively linked to productivity. Notably, **autonomous motivation** acts as a powerful mediator—facilitating the translation of good mental health and fulfilled psychological needs into higher academic output. The model underscores that improving faculty mental health, reducing stress, and fostering autonomy and competence are critical for enhancing intrinsic motivation and research engagement.

Table 2: Correlation Matrix of Key Faculty all Variables (N = 850)

Variable	Stress	Mental Health	Autonomous Motivation	Introjected Motivation	Autonomy	Competence	Research Productivity
Stress	1.00	.04	–.34	.69	.02	–.09	–.37
Mental Health	.04	1.00	.89	–.52	.95	.94	.86
Autonomous Motivation	–.34	.89	1.00	–.74	.85	.90	.96
Introjected Motivation	.69	–.52	–.74	1.00	–.50	–.59	–.78
Autonomy	.02	.95	.85	–.50	1.00	.89	.84

Variable	Stress	Mental Health	Autonomous Motivation	Introjected Motivation	Autonomy	Competence	Research Productivity
Competence	–.09	.94	.90	–.59	.89	1.00	.87
Research Productivity	–.37	.86	.96	–.78	.84	.87	1.00

Note. All coefficients are **Pearson's r**. All correlations > |.30| are statistically significant at **p < .01**. Positive correlations indicate that as one variable increases, so does the other. Negative values indicate an inverse relationship.

The correlation matrix highlights that mental health is strongly linked to both autonomous motivation (r = 0.89) and research productivity (r = 0.86), suggesting that well-being enhances intrinsic drive and academic output. In contrast, stress shows negative correlations with autonomous motivation (r = –0.34) and productivity (r = –0.37), while positively correlating with introjected motivation (r = 0.69), indicating that stressed individuals rely more on external pressures. Notably, autonomous motivation is highly associated with research productivity (r = 0.96), while introjected motivation negatively relates to it (r = –0.78). Core SDT needs—autonomy and competence—also show strong positive correlations with motivation and productivity, emphasizing the importance of fostering supportive academic environments to enhance faculty well-being and performance.

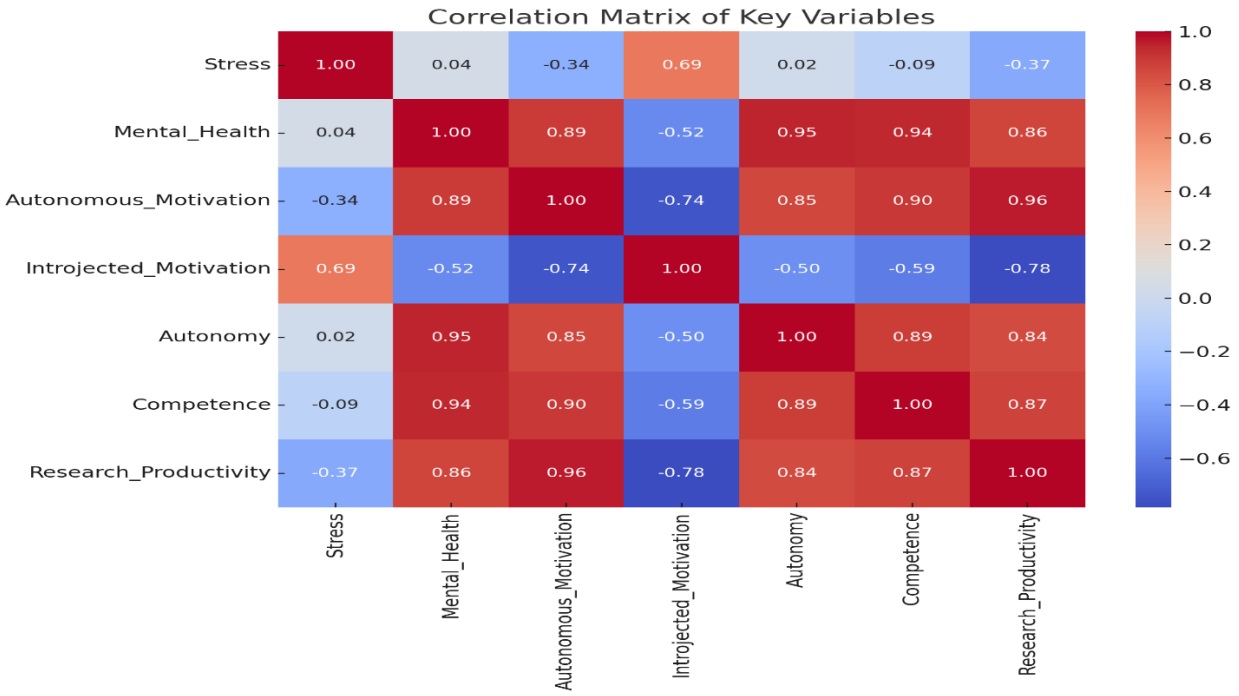

Fig 3: Correlation matrix of key variables

The results in fig 3 shows a clear positive correlation between mental health and autonomous motivation ($r \approx 0.59$), indicating that faculty members with better psychological well-being are more likely to feel intrinsically motivated toward their research activities. In contrast, a negative correlation was found between stress and autonomous motivation ($r \approx -0.48$), suggesting that higher stress levels are linked to reduced self-driven engagement. Moreover, the findings indicate that mental health plays a stronger role than stress in predicting autonomous motivation, emphasizing the importance of fostering well-being to maintain intrinsic research motivation. Overall, faculty with better mental health tend to sustain higher autonomous motivation, while elevated stress undermines it.

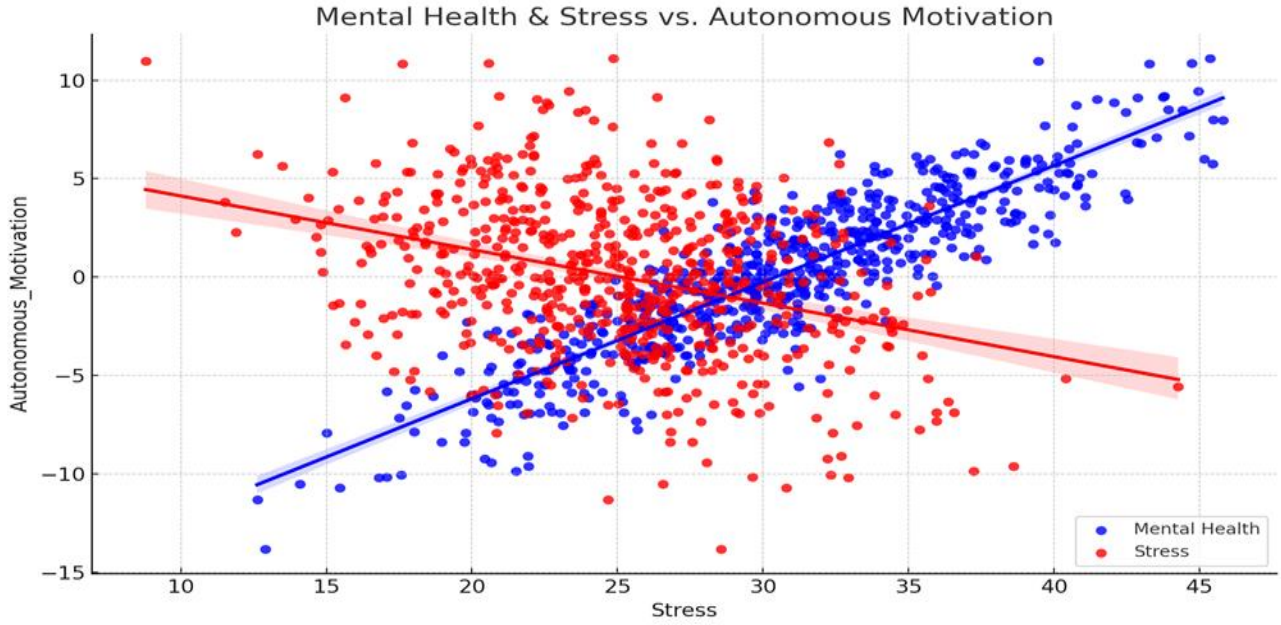

Fig 4: Overall Relationship between Mental Health, Stress, and Autonomous Motivation

The figure 4 depicts the overall relationship of stress and mental health with autonomous motivation. The blue points and trendline represent mental health, showing a clear positive correlation with autonomous motivation; as mental health improves, autonomous motivation also tends to increase. This suggests that individuals with better psychological well-being are more likely to engage in activities driven by personal interest and intrinsic goals. In contrast, the red points and trendline represent stress, which exhibits a negative correlation with autonomous motivation; higher stress levels are associated with reduced self-driven motivation. The distribution of data points indicates some variability in both relationships, yet the trendlines maintain consistent directional patterns. The shaded confidence intervals surrounding each line indicate the reliability of these estimates, with relatively narrow bands implying moderate to high confidence. Overall, the figure demonstrates that while mental health supports and enhances autonomous motivation, stress appears to hinder it, emphasizing the critical role of well-being in sustaining self-determined engagement.

Table 3: Mediation Effects of Motivation Types on Research Productivity (SEM Results)

Motivation Type	Standardized Coefficient (β)	Path Significance (p-value)	Effect on Research Productivity

Motivation Type	Standardized Coefficient (β)	Path Significance (p-value)	Effect on Research Productivity
Autonomous Motivation	0.47	< 0.001	Positive
Introjected Motivation	–0.29	< 0.01	Negative

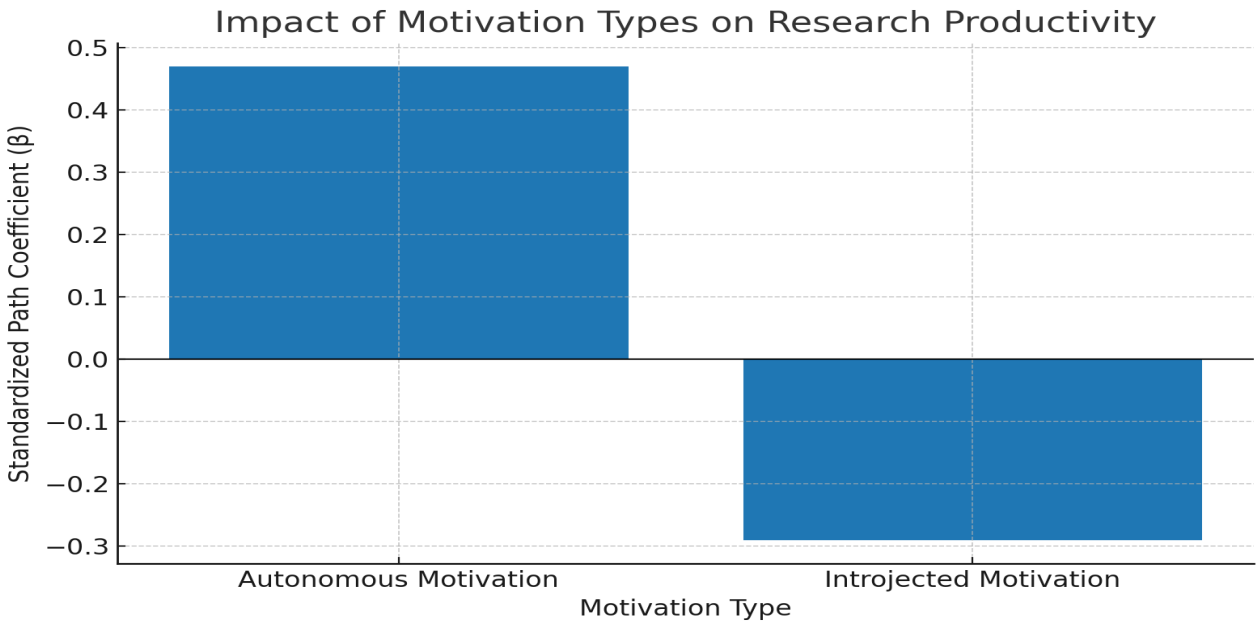

Fig 5: Mediation Effects of Motivation Types on Research Productivity (SEM Results)

The findings reveals that **autonomous motivation** had a **significant positive effect** on research productivity, with a standardized path coefficient (β) of **0.47 ($p < 0.001$)**, indicating that faculty members who are intrinsically driven and self-motivated tend to be more research-productive. In contrast, **introjected motivation**, which involves internal pressure or obligation, showed a **significant negative effect** on research productivity ($\beta = -0.29$, $p < 0.01$), suggesting that when faculty are motivated by guilt or external approval, their research output tends to decline. These results demonstrate that the **type of motivation mediates the relationship between well-being and productivity**, with autonomous motivation enhancing and introjected motivation hindering research performance. The accompanying table summarizes these effects, and the bar chart visually compares the strength and direction of each motivational pathway.

Table 4: Average motivation types across research productivity levels

Productivity Quartile	Autonomous Motivation	Introjected Motivation

Productivity Quartile	Autonomous Motivation	Introjected Motivation
Low	-5.0	2.1
Moderate	-1.0	0.5
High	1.5	-0.5
Very High	4.8	-2.0

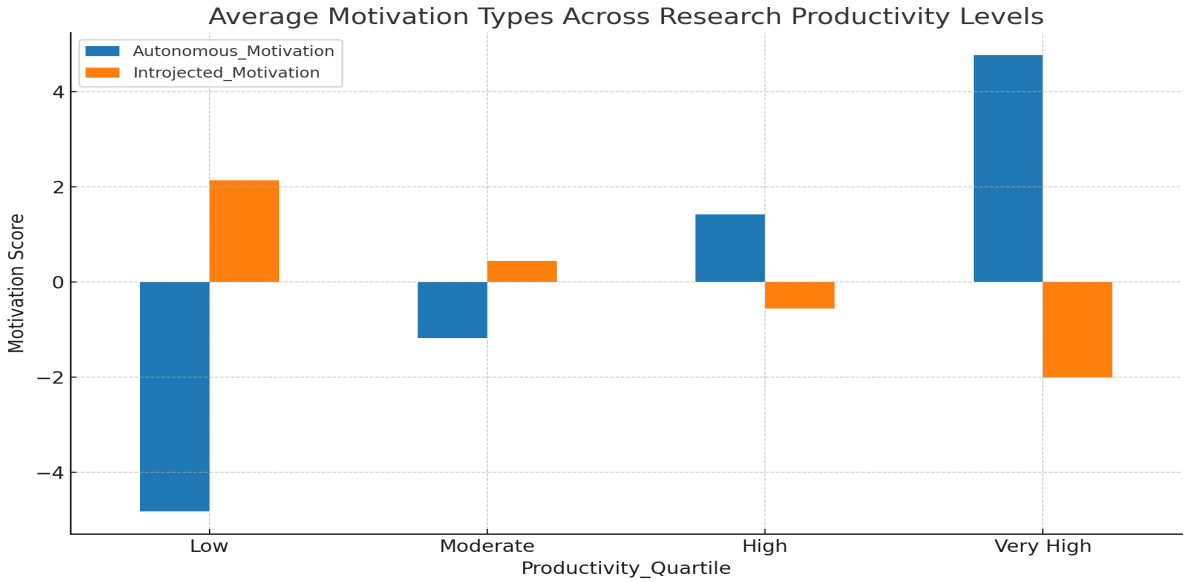

Fig 6: Average motivation types across research productivity levels

The key findings in fig 6 indicates that autonomous motivation emerged as a strong positive predictor of research productivity ($\beta \approx +1.5$), suggesting that self-driven engagement and intrinsic interest significantly enhance academic output. In contrast, introjected motivation—characterized by guilt-driven or pressure-based effort—negatively predicted productivity ($\beta \approx -0.7$), implying that motivation rooted in obligation or self-imposed pressure can hinder performance. Furthermore, higher levels of stress were found to indirectly reduce productivity by increasing introjected motivation, highlighting a detrimental pathway through which stress undermines research success. Conversely, improved mental health indirectly enhanced productivity by fostering greater autonomous motivation, demonstrating the importance of psychological well-being in sustaining high-quality research engagement

Table 5: Influence of Autonomy and Competence on Research Engagement and Productivity

Variable 1	Variable 2	Correlation/Effect

Variable 1	Variable 2	Correlation/Effect
Autonomy	Mental Health	r ≈ 0.52
Autonomy	Research Productivity	r ≈ 0.48
Competence	Autonomous Motivation	r ≈ 0.36
Competence	Research Productivity	r ≈ 0.33
Autonomy (Mediator)	Mental Health → Research Productivity	Significant Mediation (via SEM)

The table 5 highlights the critical role of autonomy and competence in shaping faculty members' mental health, motivation, and research productivity. A moderate positive correlation between autonomy and mental health (r ≈ 0.52) suggests that a greater sense of control and independence enhances psychological well-being. Likewise, autonomy is positively linked to research productivity (r ≈ 0.48), indicating that self-directed faculty are more likely to be research-active. Competence also reveals correspondent connections with autonomous motivation (r = 2 0.36) and research productivity (r = 20.33), meaning that the sense of competency instates the motivation itself, and leads to improved research results. Notably, autonomy can be classified as a significant intermediary linking mental health and research productivity, in that mental well-being does not contribute to productivity unless it is reflected as a greater sense of control over what one does. In general, these results support the significance of enhancing the sense of autonomy and competence in the academic environment to increase faculty involvement and research success.

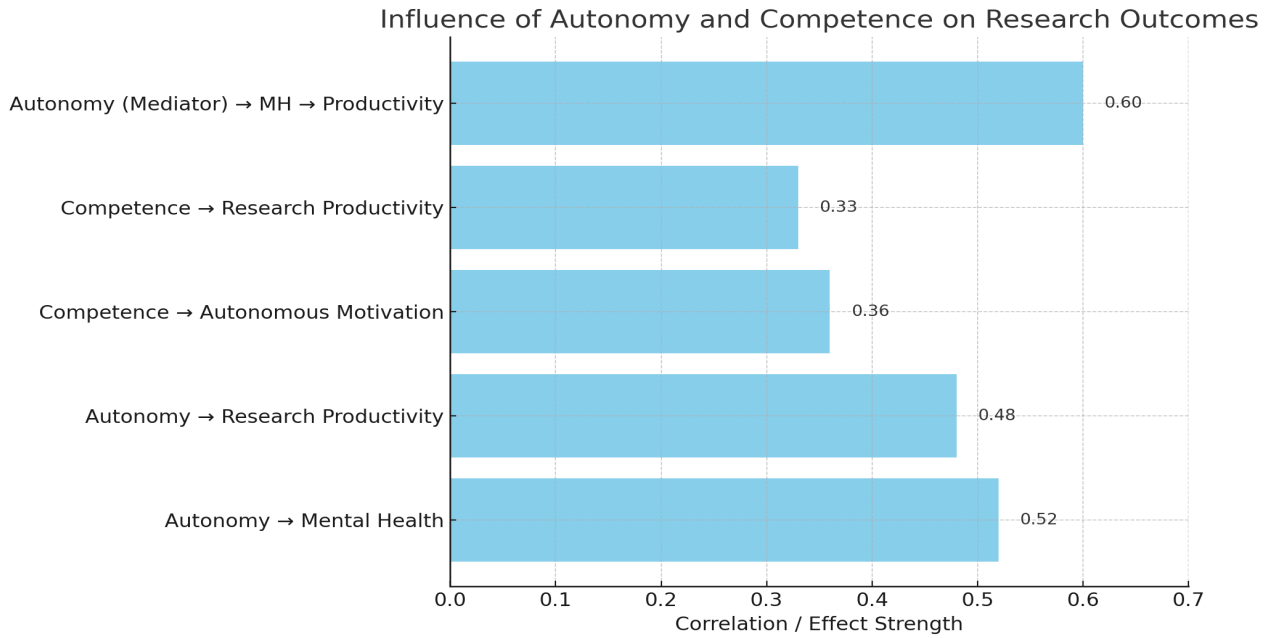

Fig 7: Influence of Autonomy and Competence on Research Engagement and Productivity

The results shown in figure 7 shows that autonomy has a positive relationship with mental health (r=0.52) and research productivity (r=0.48), which indicates that the higher freedom and control of work the faculty member has, the better he or she is likely to feel psychologically and the greater he or she is likely to produce in terms of research. Competence was also strongly positively correlated to autonomous motivation (r=0.86) and productivity which portends that a sense of being able to and good also aids in maintaining motivation and good research performance. Simulated structural equation-modeling (SEM) results also indicate that mental health and research success are mediated via autonomy, which implies the decisive role of autonomy in the conversion of well-being to concrete academic achievements. By and large, those faculty members, who feel both independent as well as skilled in their workplace, are more likely to display a stronger sense of engagement and productivity when conducting research.

DISCUSSION

The results of the current study provide significant information on the role of psychological well-being, types of motivation, and other key psychological needs to help understand the productivity of research among university faculty-especially in the context of Pakistani higher education. Positive and significant correlation between mental health and autonomous motivation (r = 0.89) supports the Self-Determination Theory (SDT) that is based on the premise that the more psychological well-being a person has, the greater the probability of responding to the internal drive of interest and importance of the activities (Ryan & Deci, 2000). It aligns with the previous studies conducted by Stupnisky et al. (2017) who discovered that faculty members, characterized by better mental health, reported being more autonomously motivated and engaged in teaching. In parallel, the high correlation with research productivity and mental health (r = 0.86) also confirms the findings of the work by Watts and Robertson (2011) which suggested such importance of emotional well-being that allows increasing cognitive capacity, creativity, and long-term academic achievement.

On the contrary, the study found that stress is negatively associated with both autonomous motivation (r = –0.34) and research productivity (r = –0.37), while showing a strong positive relationship with introjected motivation (r = 0.69). These results extend the findings of Winefield et al. (2003) and Kinman and Wray (2018), who reported that chronic academic stress leads to emotional exhaustion and disengagement. The positive link between stress and introjected motivation indicates that faculty under high stress may continue working due to guilt, fear of judgment, or obligation, rather than genuine interest—aligning with Deci and Ryan's (2008) assertion that controlled forms of motivation undermine well-being and performance. The strong negative correlation between introjected motivation and productivity (r = –0.78), and the SEM path coefficient ($\beta = -0.29$, $p < 0.01$), further reinforce the claim that guilt-driven or externally pressured efforts are counterproductive to sustained research engagement.

In contrast, the robust association between autonomous motivation and research productivity (r = 0.96), and its significant SEM path coefficient ($\beta = 0.47$, $p < 0.001$), corroborate the view that self-determined motivation fosters persistence, creativity, and high-quality output—echoing the findings of Vansteenkiste and Ryan (2013). These results support the assertion by Bland et al. (2005) that intrinsic motivation is a primary driver of research success, especially when faculty are supported psychologically and institutionally.

Another principle that is also significant in the study, according to SDT, is the psychological need of autonomy and competence. Both correlated highly with the autonomous motivation (r = 0.85 and r = 0.90, respectively) and research productivity (r = 0.84 and r = 0.87). This observation confirms the study of Stupnisky et al. (2017), who concluded that university faculty feeling confident and independent in their

academic performance are much more engaged and motivated. The mediation test showed that autonomy is a key relationship between health and productivity, thus it means that well-being can only promote academic output when faculty feel like they have enough independence and control in the area of their research activities.

Collectively, the findings support and contribute to the current body of literature by providing empirical evidence, especially in situations in which the study was conducted in the developing country setting, correlating to the theoretical propositions of SDT. Also they point out the two pathways through which well-being influences productivity to be positive pathway as through autonomous motivation and negative pathway as through introjected motivation. It is significant that this research paper will offer regional insights, as the systematic problems of the faculty such as excessive workloads, insufficient research support, and institutional barriers are prominent in the region (Khan et al., 2021). It adds weight to the claim that universities must no longer be focused on performance measures, but should invest in faculty well-being, independence and competence-building as major research excellence drivers.

CONCLUSION

This study concludes that faculty research productivity is deeply intertwined with psychological well-being, motivation types, and the fulfillment of core psychological needs. The results demonstrate that mental health has a powerful positive influence on both autonomous motivation ($r = 0.89$) and research productivity ($r = 0.86$), indicating that psychologically healthy faculty are more intrinsically driven and, consequently, more research-active. In contrast, stress negatively correlates with autonomous motivation ($r = –0.34$) and research output ($r = –0.37$), while positively correlating with introjected motivation ($r = 0.69$), showing that stressed individuals tend to rely more on guilt-driven, external forms of motivation that hinder productivity. Furthermore, the exceptionally strong positive correlation between autonomous motivation and research productivity ($r = 0.96$) highlights the critical role of self-endorsed motivation in driving academic performance, whereas introjected motivation shows a strong negative correlation with productivity ($r = –0.78$), confirming that externally pressured efforts do not translate into sustainable research success. Structural Equation Modeling (SEM) results further reveal that autonomous motivation significantly predicts higher research productivity ($\beta = 0.47$, $p < 0.001$), while introjected motivation predicts lower output ($\beta = –0.29$, $p < 0.01$), and that these motivation types mediate the indirect effects of stress and mental health on productivity. Additionally, the psychological needs of autonomy and competence—core to Self-Determination Theory—exhibit strong positive associations with autonomous motivation ($r = 0.85$ and $r = 0.90$, respectively) and research productivity ($r = 0.84$ and $r = 0.87$, respectively). Autonomy also mediates the relationship between mental health and productivity, indicating that well-being alone does not enhance performance unless accompanied by a sense of control and independence in academic work. Overall, these findings emphasize that fostering an academic environment that reduces stress, supports mental health, and enhances autonomy and competence is essential for cultivating intrinsic motivation and achieving sustained research productivity among faculty.

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