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The moderating effects of education level on mental health among young individuals

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Abstract

This study investigates the relationship between mental health disorders and workplace productivity, specifically examining the effects of anxiety, depression, post-traumatic behavior (PT), and stress behaviors. This study also explores how education level moderates these relationships. Data were collected from 161 participants through an online questionnaire, using convenience sampling. Partial Least Squares Structural Equation Modelling (PLS-SEM) via SmartPLS was employed to analyze direct relationships and moderating effects. The results indicate that anxiety and depression significantly and negatively impact workplace productivity, while PT and stress behaviors show no significant effects. The study found that education level significantly moderates the relationship between mental health disorders and workplace productivity. These findings expand our understanding of how mental health impacts workplace performance across educational backgrounds. The research provides practical implications for organizations in developing targeted mental health interventions and support programs based on employees' academic levels.

Keywords:
Mental health;
Workplace productivity;
Education level;
Anxiety
Depression
Post traumatic behavior

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1. Introduction

Mental health in Malaysia has gained increasing attention in recent years, particularly considering the COVID-19 pandemic, which highlights the urgent need for mental health support across the population. The National Health and Morbidity Survey (NHMS) 2023 revealed that the prevalence of mental health problems increased from 7.9% (2019) to 16.5% (2023). This growing prevalence underscores the importance of mental health services and interventions as the country strives to address the mental well-being of its citizens more effectively. The Malaysian government has implemented several initiatives to improve mental health services and reduce the stigma surrounding seeking help. These include mental health screenings and counselling services in primary healthcare settings, and a testament to the government's commitment.

In addition, the introduction of telehealth services for mental health has provided greater access to care, particularly in rural areas with limited resources. These efforts, combined with increased public awareness campaigns, have begun to shift societal attitudes toward mental health, fostering a more supportive environment for those in need (Jane Osareme et al., 2024; Walsh & Foster, 2021; Fusar-Poli et al., 2021). As an emerging and developing nation, Malaysia must focus

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on boosting its productivity and maximizing profits. Given the recent rise in mental health disorders, businesses must understand and address these issues in the workplace. By combating mental health disorders, companies can prevent further losses and enhance overall productivity, thus contributing to the nation's economic growth.

Approximately 14 percent of adults aged 60 years and over live with a mental disorder (i.e., anxiety, depression, or stress) (World Health Organisation, 2023). According to research, high-income nations have seen a sharp rise in the number of sick days taken by employees owing to mental health issues, which affect employee productivity (Rugulies et al., 2023). The National Health and Morbidity Survey (NHMS) in 2020 reported that nearly 30 percent of Malaysians aged 16 and above have experienced mental health issues. According to de Oliveira et al. (2023), the data presents unambiguous proof that mental health issues are linked to reduced productivity, which is measured by rising presenteeism and absenteeism (more days missing from work). Similarly, workers with mental health issues have produced subpar work, which lowers productivity and profitability for their organization (Patil, 2018). According to a survey in Malaysia, 87 per cent of female employees reported having anxiety or panic attacks regularly, and nearly all of them said that their generalized anxiety disorder (GAD) symptoms affected their ability to perform at work (Habib & Laidey, 2021).

However, there is insufficient data to suggest that anxiety at work has detrimental effects on productivity. Regardless of the social-evaluative nature of work, employees who experience anxiety at work are more likely to perform similarly to their less anxious counterparts (Zhang et al., 2022). Hence, there is a need to learn more about the mechanisms underlying the reduction in work productivity caused by mental illness, as this knowledge could guide the development of employment policies and practices aimed at reducing absenteeism (de Oliveira et al., 2023).

The intersection between mental health and education was significant. Schools and universities must serve as learning centers and emotional support systems. By integrating mental health literacy into curricula, providing counselling services, and training teachers to recognize warning signs, educational institutions can help students develop resilience while addressing the psychological challenges that impede learning. Consequently, to better acknowledge that education level affects an employee's mental health, the four common triggers, such as stress behaviors, depression disorder, anxiety disorder, and post-traumatic behavior (PT), were used to explore two research questions:

(i) What are the major mental health disorders that significantly affect workplace productivity?
(ii) Does education level moderate the relationship between employee's mental health and workplace productivity?

This study explored individual mental health using a quantitative approach focusing on four key factors. The participants came from diverse backgrounds and varied educational levels, thus providing a broad perspective. The study's contributions are significant as they enhance the understanding of mental health and the common factors that impact workplace productivity. By identifying the most critical influences on employees' mental health, this study offers valuable insights for organizations. These insights can be used to develop strategies to support employee well-being and improve overall organizational productivity, fostering a healthier and more productive work environment.

2. Literature review

Extensive research has documented the impact of depression and anxiety on workplace absenteeism and presenteeism (Deady et al., 2022). Studies by the World Health Organization (2019) estimate that mental health conditions cost the global economy $ 1 trillion annually in

terms of lost productivity. While interventions, such as employee assistance programs, show promise (Arias et al., 2022), significant research gaps persist regarding the effectiveness of integrated workplace mental health strategies. In particular, the longitudinal outcomes of mental health initiatives on productivity metrics, intervention efficacy across diverse industries, and the economic return on investment for preventative versus reactive approaches are discussed.

Many companies and enterprises constantly compete, striving for achievements and continuous progress. However, the ever-evolving business landscape marked by unexpected events and rapid changes has made it increasingly difficult for businesses to sustain their market positions. To overcome these challenges and meet the growing demand of consumers, companies must focus on achieving and maintaining high levels of productivity. This ongoing development is essential not only for meeting corporate goals, but also for securing long-term success. Among the various factors that influence a company's success, employee productivity is a critical element that directly impacts overall performance and competitiveness (Sitopu et al., 2021). According to previous studies, a company's capacity to accomplish organizational goals, obtain a competitive edge, boost production at a low cost, and increase profitability is primarily dependent on its human resource management (Patil, 2018)

Companies that disregard the importance of increasing staff productivity are perceived as lacking competitiveness and are overshadowed by their rivals. Employee productivity growth offers significant benefits to both employers and workers. For example, a nation with greater productivity would have more favorable economic growth, increased profitability, and improved social advancement (Sharma & Sharma, 2014). Firms will experiment with various strategies to boost worker productivity and secure long-term success in organizations as the business environment is constantly changing and customer needs are evolving (Law & Kue, 2020).

When employees face mental health challenges, the impact ripples through their work life, leading to decreased job engagement, reduced productivity, heightened health risks, and an increased likelihood of workplace accidents (Kensbock et al., 2022). The economic toll is particularly significant when workers, while present at work, struggle to perform at their usual capacity because of mental health difficulties. The workplace itself can nurture or challenge mental wellbeing. Various factors within the work environment - from organizational culture and management practices to support available for daily tasks and workplace relationships – can significantly influence an employee's mental health. Recognizing this crucial connection, organizations have recently accelerated their efforts to develop effective strategies to prevent, reduce, and manage employees' mental health challenges. This represents a growing understanding that supporting mental health at work is not just about helping individuals, but also about creating healthier, more productive workplaces for everyone. Therefore, encouraging mental wellness among employees is a multifaceted undertaking that requires cooperation from several leadership echelons (Wu et al., 2021).

2.1 Mental health and workplace productivity

The success of modern organizations depends increasingly on the well-being and performance of their workforce. Employee productivity, which is characterized by the ability of workers to complete tasks and deliver high-quality outputs efficiently, has emerged as a crucial priority for businesses worldwide (Law & Tiah, 2022). Beyond simply measuring the number of tasks completed or products created, organizations now recognize that employee productivity is a complex interplay of factors that affect how well people can perform their jobs. Understanding what drives and hinders productivity has become essential for organizations to build and maintain a thriving workforce in today's competitive environments. Employee performance increases when education, training, experience, and work discipline are simultaneously provided (Rivaldo & Nabella, 2023). The ability of an individual or group of employees to finish work in the allotted time to maximize business efficiency is the criterion used to quantify productivity.

Nowrouzi-Kia et al. (2022) found that nine factors were related to mental health and work performance among healthcare workers. These factors included feeling depressed or anxious, not getting enough support, being under stress at work, being unprepared for work, being afraid of getting sick, being fearful of getting burned out or fatigued, and financial concerns related to changes in earnings and daily expenses. Likewise, the two most common health problems in the construction industry today are depression and anxiety, and determining their root causes can significantly reduce their effects of these problems (Rouhanizadeh & Kermanshachi, 2021). Since businesses primarily depend on staff productivity for success, employee workplace productivity has become extremely important (Sharma & Sharma, 2014).

There is a significant relationship between employees' mental health and workplace productivity. Workers with untreated mental health conditions demonstrate substantially higher rates of absenteeism than their counterparts without such conditions (Sultan & Sultan, 2025). However, it is vital to note that workplace mental health interventions can produce positive outcomes when adequately implemented (Wu et al., 2021). The authors also said that organizations with comprehensive mental wellness programs reported higher productivity levels than those without such initiatives. Hence, knowledge gaps may significantly hinder the development of evidence-based mental health policies in the workplace setting.

2.2 Stress behaviour

Chronic stress affects physiological and psychological functioning (Noushad et al., 2021). Similarly, prolonged stress may increase the risk of cardiovascular disease. Stress significantly predicts diminished cognitive performance and decision-making capability in workplace contexts (James et al., 2023). When an employee's responsibilities conflict with those of other workers, leading to interpersonal conflict, job stress may result (Almaamari, 2023). According to Bui et al. (2021), the relationship between overall stress and productivity is inverse and lower productivity scores are substantially correlated with higher stress levels. This creates a bitter and upsetting working environment for employees. The current literature requires further investigation into effective stress mitigation strategies across organizations. Hence, employee productivity may increase if employers take steps to reduce workplace stress (Bui et al., 2021).
H1: There is a positive relationship between stress behaviour and workplace productivity.

2.3 Depression symptoms

Depression symptoms manifest across the cognitive, emotional, physical, and behavioral domains (Attia et al., 2022). Individuals experience persistent negative thoughts, difficulty concentrating, and diminished decision-making abilities (Palamarchuk & Vaillancourt, 2021). Physical symptoms include disrupted sleep patterns, fatigue, changes in appetite, and psychomotor retardation or agitation (Belvederi Murri et al., 2024). Mental health in the workplace has two challenges that stand out: depression and anxiety. The impact appears in two key ways: people missing work entirely (absenteeism), or being physically present but struggling to focus and perform (presenteeism). The scale of this challenge has been staggered.
H2: There is a positive relationship between depression symptoms and workplace productivity.

2.4 Anxiety traits

Anxiety traits manifest through cognitive, physiological, and behavioral dimensions across clinical populations (Stein et al., 2021). Individuals exhibit excessive worry, catastrophic thinking, attentional biases toward threats, and difficulty with uncertainty (Brown et al., 2023). Physiologically, symptoms include autonomic hyperarousal, increased muscle tension, disrupted sleep patterns, and somatic complaints such as gastrointestinal distress (Shiha & Aziz, 2021).

Behaviorally, avoidance, safety-seeking behaviors, and hypervigilance predominate (Krishnamurthy, 2025). The relationship between the environment of a workplace and mental health or general health has been studied extensively in past research, as a workplace may provoke anxiety in most individuals. Therefore, it is essential to investigate whether anxiety disorders affect workplace productivity.
H3: There is a positive relationship between anxiety traits and workplace productivity.

2.5 Post-traumatic behaviour (PT)

PT is a multifaceted mental health disorder that usually develops after a traumatic experience and is characterized by intrusive thoughts, flashbacks, emotional numbness, and elevated anxiety (Wizner et al., 2022). These traumatic experiences may result in an intense fear response, persistent helplessness, memories, and flashbacks of traumatic incidents. The three types of symptoms associated with PT are avoidance, hypervigilance, and reexperience (Karsen et al., 2014). For instance, employees who have experienced or witnessed violence at work may develop extreme vigilance, a constant state of anxiety, and persistent mental replay of the horrific event (Wizner et al., 2022). Most PT-related economic impacts stem from indirect organizational costs, such as productivity losses, although comprehensive studies on this condition remain scarce in many countries (Lee et al., 2019). Trauma in the workplace can have a detrimental impact on several key factors, including turnover, errors, accidents, job performance, productivity, efficiency, and overall effectiveness. Consequently, reduced workplace productivity can lead to underperformance.
H4: A positive relationship exists between post-traumatic behaviour and workplace productivity.

2.6 Education level as a moderator

Education appears to play a decisive role in mental well-being. Research has uncovered an interesting pattern: for each additional year of schooling (Kondirolli & Sunder, 2022), people were nearly 10 percent less likely to experience anxiety symptoms and approximately 11 percent less likely to report feeling depressed. People with higher educational levels experience anxiety or depression (Kupcova et al., 2023). For instance, each year of education appears to add another layer of protection against mental-health challenges. It is as if education equips people with knowledge and skills and provides better tools for managing mental health. Similarly, a study in Switzerland found that the mental well-being of college students is comparable to that of their non-student peers. The authors found that the effects of several aspects of mental health on obtaining a higher education degree were insignificant (Burger & Strassmann Rocha, 2024). Higher education levels seem to impact mental health, which in turn may influence an individual's productivity at work. Hence, this study proposes the following hypothesis:
H5: Education level moderates the relationship between stress behavior, depression disorder, anxiety disorder, PT, and workplace productivity.

3. Methods

In this study, 161 respondents were surveyed using convenience sampling, with data collected through an online questionnaire distributed via social media platforms such as Facebook, which is widely used in Malaysia. The survey assessed workplace stress by examining five key indicators: stress related to working hours, workplace conditions, interpersonal relationships with colleagues, management policies, and concerns about job security (Ogińska-Bulik, 2005; Halkos & Bousinakis, 2010). Depression symptoms were measured using four items that evaluated various personal issues that affect workplace performance: productivity disruptions caused by relationships or family difficulties, financial concerns, unexpected loss of work interest,

persistent feelings of restlessness, and challenges with concentration or memory that interfere with job effectiveness (Hysenbegasi et al., 2005).

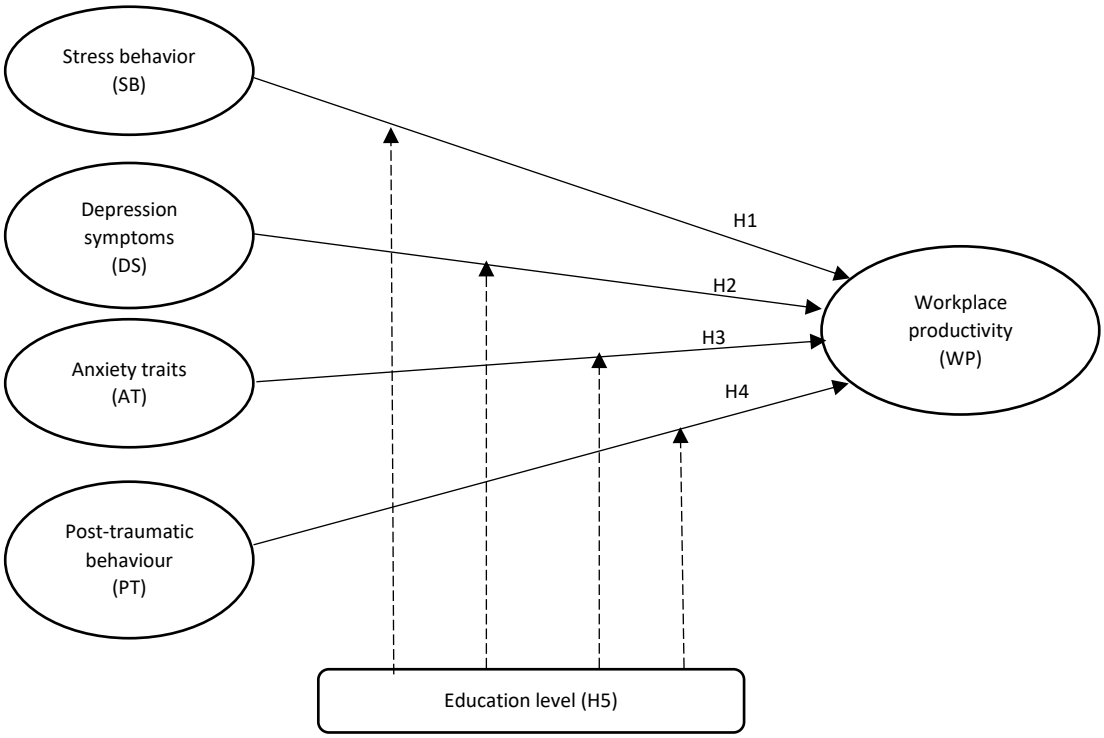

Figure 1. *Conceptual framework*
Adapted from Davidson et al. (1997), Ogińska -Bulik (2005), Hysenbegasi et al. (2005), Halkos and Bousinakis (2010), and Muschalla et al. (2010)

Workplace anxiety was gauged based on feelings of anxiety stemming from work responsibilities, excessive workload, workplace uncertainty, insufficient support systems, and unpleasant or adverse working conditions (Muschalla et al., 2010). Five items were used to measure how past trauma affects workplace functioning, focusing on diminished productivity due to recurring traumatic experiences, concentration difficulties following traumatic events, productivity disruptions triggered by trauma reminders, workplace performance affected by trauma-related nightmares, and decreased effectiveness resulting from painful traumatic memories or thoughts (Davidson et al., 1997).

This study employed a variance-based partial least squares (PLS) tool within structural equation Modelling (SEM), which is gaining popularity owing to its flexibility and advanced capabilities in statistical analysis (Hair et al., 2021). Participants rated their agreement with each item using a 5-point Likert scale, where 1 indicated strong disagreement and 5 indicated strong agreement. This methodological approach allowed for a comprehensive data analysis and provided robust insights into the variables under study.

4. Results

Individual or relational demographics were included in the survey (i.e., sex, age, education level, ethnicity, and marital status) (Table 1). Most respondents were female (70.2 percent) and only 29.8 percent were male. The respondents were of different age groups, with a majority of 31.1

percent aged 25–34 years. Of these, 12.4 percent were 12 to 24 years old, while 18 percent were 35 to 44 years old. A total of 20.5 percent were aged 45 to 54, and 16.1 percent were aged 55 to 64. A minority of 1.9 percent were aged 65 years and above. The data were collected among the major races in Malaysia: 28.6 percent Malay, 62.7 percent Chinese, 4.3 percent Indian, and 4.3 percent other ethnicities. Most of the respondents were married (57.1 percent), while the others were single (41 percent) and separated or divorced (1.9 percent). In terms of education level, there were five categories: high school (5 percent), Foundation, Diploma, and A-Levels (12.4 percent), bachelor's degree (53.4 percent), master's degree (20.5 percent), and PhD (8.7 percent). The goal of this research was to include a broader population.

Table 1: Respondents' profile

	n=161	Percentage
Sex		
Male	48	29.8
Female	113	70.2
Age		
18-24 years old	20	12.4
25-34 years old	50	31.1
35-44 years old	29	18.0
45-54 years old	33	20.5
55-64 years old	26	16.1
65 and above	3	1.9
Ethnicity		
Malay	46	28.6
Chinese	101	62.7
Indian	7	4.3
Others	7	4.3
Marital Status		
Single	66	41.0
Married	92	57.1
Separated/Divorced	3	1.9
Education level		
High school (SPM/IGCSE/UEC)	8	5.0
Foundation/Diploma/A-levels	20	12.4
Bachelor Degree	86	53.4
Master Degree	33	20.5
PhD	14	8.7

The dataset presents a descriptive statistical analysis of multiple variables (SB1-SB5, DS1-DS4, AT1-AT5, PT1-PT5, WP1) from 161 respondents. All variables were measured on a 5-point scale (Table 2). The mean scores range from 2.07 to 3.08, indicating generally moderate responses across variables. AT2 showed the highest mean (3.08), whereas PT4 demonstrated the lowest (2.07). Standard deviations consistently hover around 1.1 to 1.2, suggesting a similar response variability across all variables. Regarding the distribution characteristics, skewness values are predominantly positive, indicating right-skewed distributions for most variables, particularly pronounced in the PT series (0.727-0.986). Only SB1, SB2, and AT2 showed slight negative skewness. Kurtosis values were predominantly negative, suggesting flatter distributions than usual. The PT variable group showed notably lower means than the others, potentially indicating less agreement or lower ratings in this dimension. In comparison, the AT group demonstrated relatively higher means, indicating greater participant agreement with this variable.

Table 2: Descriptive statistics

				Skewness		Kurtosis	
		Mean	Std. Dev.	Statistic	Std. Error	Statistic	Std. Error
Stress behaviour	SB1	2.92	1.107	-0.007	0.191	-0.579	0.380
	SB2	2.98	1.089	0.020	0.191	-0.691	0.380
	SB3	2.88	1.166	0.173	0.191	-0.805	0.380
	SB4	2.96	1.185	0.131	0.191	-0.805	0.380
	SB5	2.61	1.210	0.385	0.191	-0.720	0.380
Depression symptoms	DD1	2.35	1.206	0.558	0.191	-0.667	0.380
	DD2	2.53	1.235	0.404	0.191	-0.854	0.380
	DD3	2.62	1.224	0.305	0.191	-0.924	0.380
	DD4	2.52	1.119	0.460	0.191	-0.501	0.380
Anxiety traits	AD1	2.93	1.215	0.090	0.191	-1.065	0.380
	AD2	3.08	1.265	-0.041	0.191	-1.081	0.380
	AD3	2.79	1.191	0.215	0.191	-0.831	0.380
	AD4	2.84	1.248	0.162	0.191	-1.013	0.380
	AD5	2.76	1.258	0.227	0.191	-0.991	0.380
Post-traumatic behaviour	PT1	2.13	1.124	0.888	0.191	0.046	0.380
	PT2	2.20	1.166	0.850	0.191	-0.101	0.380
	PT3	2.25	1.204	0.727	0.191	-0.453	0.380
	PT4	2.07	1.124	0.986	0.191	0.227	0.380
	PT5	2.11	1.202	0.975	0.191	0.027	0.380
Workplace productivity		2.61	1.265	0.422	0.191	-0.888	0.380

4.1 Reliability analysis

As shown in Table 3, all constructs' Average Variance Extracted (AVE) exceeded the recommended threshold of 0.50, with values ranging from 0.600 to 0.855. Specifically, anxiety disorder (0.678), depression symptoms (0.600), post-traumatic behavior (0.855), and stress behavior (0.607) demonstrated adequate convergent validity, indicating that each construct effectively explained at least 50 percent of its indicators' variance. Bootstrap confidence intervals were used to verify that all constructs surpassed the minimum threshold of composite reliability of 0.70. The results showed strong internal consistency, with anxiety traits at 0.884, depression symptoms at 0.846, post-traumatic behavior at 0.960, and stress behavior at 0.845. Despite the challenge of achieving high alpha values with fewer than ten items per scale, all constructs demonstrated excellent internal consistency reliability. The values for anxiety traits (0.881), depression symptoms (0.785), post-traumatic behavior (0.958), and stress behavior (0.837) all exceeded the recommended threshold of 0.70 Cronbach's.

Table 3: Constructs' reliability

Constructs	AVE	Composite reliability	Cronbach's alpha
Anxiety traits (AT)	0.678	0.884	0.881
Depression Disorder (DS)	0.600	0.846	0.785
Post-traumatic behaviour (PT)	0.855	0.960	0.958
Stress Behaviour (SB)	0.607	0.845	0.837

4.2 Discriminant validity

Discriminant validity was assessed to confirm that each latent variable represented a distinct concept separate from the others. The evaluation used the AVE square root values and the Fornell-Larcker criterion according to Afthanorhan et al. (2021), as shown in Table 4. The results indicated that all constructs had square root values of AVE exceeding their correlations with other latent constructs, as per the Fornell-Larcker criteria. This demonstrates that the model satisfied the requirements for discriminant validity. The R^2 value for each exogenous and endogenous latent variable indicated the quality of the structural model. The R^2 values and significance test

results were obtained using bootstrapping, as presented in Table 4. An R^2 value of 0.512 suggested that the independent variables in the model explained 51.2 percent of the observed variance.

Hair et al. (2021) explained that high correlations among indicators in formative measurement models are called collinearity. The authors noted that formative measurement models typically exhibit minimal associations between the scale items. Collinearity is often assessed using the Variance Inflation Factor (VIF), which is a widely accepted metric. A VIF value should ideally range between 0.20 and 5, as values above five may indicate potential collinearity issues. Table 4 presents the VIF results for the four formative measurement models of anxiety traits, depression symptoms and stress behaviour. According to Shrestha (2020), when the VIF values fall between 5 and 10, multicollinearity may exist among the predictors in the regression model. In this study, anxiety traits (VIF = 3.386) had the highest VIF, suggesting a moderate correlation with other predictors, but not at a problematic level. Depression symptoms (VIF = 2.571), post-traumatic behavior (VIF = 2.277), and stress behavior (VIF = 2.315) all fell within the acceptable range, indicating low multicollinearity. Because all VIF values are below five, multicollinearity is not a concern, ensuring reliable coefficient estimations and model stability.

Table 4: Discriminant validity

	AT	DS	PT	SB	*R*-Square	*R*-Square Adjusted	VIF
Anxiety traits (AT)	0.824						3.386
Depression Symptoms (DS)	0.715	0.775					2.571
Post-Traumatic Behaviour (PT)	0.666	0.674	0.925				2.277
Stress Behaviour (SB)	0.726	0.566	0.468	0.779			2.315
Workplace Productivity (WP)	0.599	0.603	0.493	0.492	0.512	0.483	

4.3 Path coefficient

Path coefficients represent the relationships between the latent exogenous and endogenous variables in a structural model. These coefficients were comparable to the standardized beta (β) values used in the regression analysis (Hair et al., 2019). Each path coefficient reflects a hypothesis regarding the relationship between two latent variables in the proposed model. A path coefficient value closer to +1 indicates a strong positive relationship, whereas a value closer to -1 indicates a strong negative relationship.

The path coefficient data are summarized in Figure 2 and Table 5. The results indicated that the path coefficients ranged from -0.022 to 0.418. The most substantial relationship was observed between depression and workplace productivity *(β = 0.418),* while the weakest was between post-traumatic behavior and workplace productivity *(β = -0.022).* These findings highlight the variations in the magnitude and strength of the relationships among the constructs in the structural model. The significance and relevance of the path coefficients became more pronounced after further analysis (Hair et al., 2019).

Table 5: Summary of path coefficients

	Standard beta, β
AT	0.280
DS	0.418
PT	-0.022
SB	0.036
Edu * SB	0.341
Edu * DS	-0.248
Edu * AT	-0.297
Edu * PT	0.230

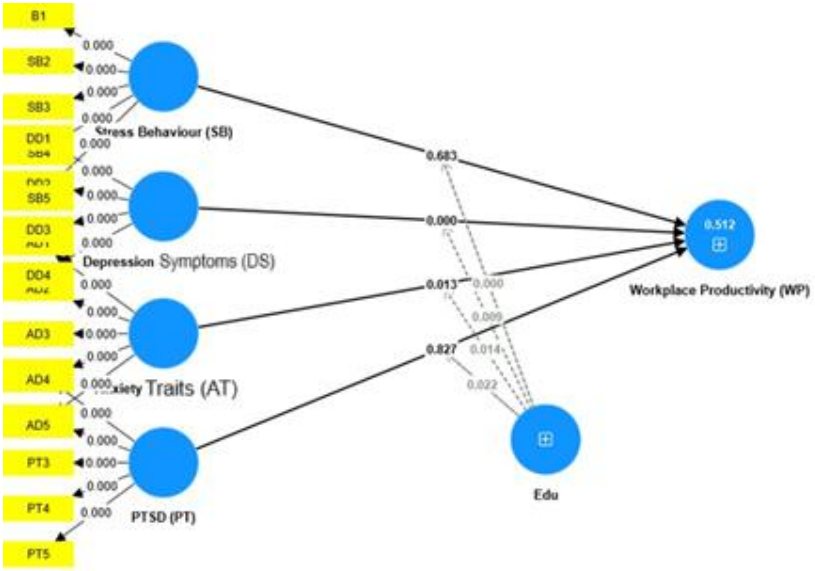

Figure 2. *Findings of the Structural Model*
Note: $p < 0.5$ and $p < 0.01$
Note: SB= Stress Behaviour, DS= Depression Symptoms, AT= Anxiety traits, Pst-traumatic disorder= PT, WP= Workplace Productivity

4.4 Hypothesis testing

Analysis of the assessment and structural models indicated that the proposed theoretical model was appropriate for further hypothesis testing. The findings in Table 6 detail the hypotheses and conclusions derived from empirical data. This table examines the relationships between various mental health factors and workplace productivity (WP) and how education moderates these relationships. Each relationship was assessed using standard beta coefficients, *t*-values, and *p*-values to determine statistical significance and support for each hypothesis.

First, the direct effects of mental health variables on workplace productivity were analyzed. Anxiety traits (AT) had *a β*= 0.113, *t*-value=2.473, and *p*-value= 0.013. This finding indicates a significant positive effect of anxiety traits on workplace productivity, meaning that higher anxiety traits are associated with increased productivity, making this relationship statistically supported. Similarly, depression disorder (DS) shows *β*= 0.099, *t*-value=4.216, and *p*-value= 0.000, which confirms a significant positive impact on workplace productivity. This result indicates that depression also has a notable effect on productivity.

In contrast, post-traumatic behavior (PT) and stress behavior (SB) did not exhibit significant effects on workplace productivity. PT has a *β* = 0.099, *a t-value = 0.219, and a p-value* of 0.827, suggesting that this relationship is not statistically significant and hence not supported. Similarly, SB has a *β* = 0.088, *t*-value of 0.409, and *p*-value of 0.683, indicating no significant impact on workplace productivity. This relationship is also not supported.

This table further explores the moderating effects of education on the relationship between mental health factors and workplace productivity. The interaction between education and stress behavior (SB) showed a *β = 0.088, t-value = 3.868,* and *p*-value of 0.000. This significant finding suggests that education level moderates the impact of stress behavior on workplace productivity, meaning that employees' education level influences the effect of stress behavior on productivity.

Similarly, education moderates the effects of depressive symptoms (DS) and anxiety traits (AT) on workplace productivity, with significant beta values and *p*-values indicating that higher education levels affect how these disorders impact productivity.

Table 6: Summary of hypothesis testing

Relationship	β	*t*-value	*p*-value	Decision
AT → WP	0.113	2.473	0.013	Supported
DS → WP	0.099	4.216	0.000	Supported
PT → WP	0.099	0.219	0.827	Not supported
SB → WP	0.088	0.409	0.683	Not supported
Moderating effects				
Edu * SB → WP	0.088	3.868	0.000	Supported
Edu * DS → WP	0.094	2.620	0.009	Supported
Edu * AT → WP	0.121	2.452	0.014	Supported
Edu * PT → WP	0.101	2.286	0.022	Supported

Lastly, education also moderated the relationship between post-traumatic behaviour (PT) and workplace productivity, with β = 0.101*, t-value = 2.286, and p-value = 0.022*. This result supports the idea that education influences the effect of post-traumatic behaviour on productivity, showing that educational level plays a role in moderating the relationship between mental health factors and workplace productivity. Overall, the findings underscore the complex interplay between mental health, education, and workplace productivity, highlighting the importance of considering the educational background in managing mental health in professional settings.

5. Discussion

The positive moderating effect of education on mental health and workplace productivity suggests that higher educational levels may provide individuals with better coping mechanisms and problem-solving skills. Educated employees are often better equipped to manage stress and mental health issues because of their enhanced critical thinking ability and access to resources. This aligns with existing research, which found that education can improve resilience and adaptability in workplace challenges. For example, educated individuals may have more effective strategies for managing anxiety and depression, leading to enhanced productivity despite mental health issues. Second, higher education levels often correlate with greater job control and autonomy, thus positively influencing workplace productivity. Employees with higher education are typically in positions that offer greater decision-making power and flexibility, which can mitigate the adverse effects of mental health disorders. Increased control can reduce job-related stress and improve job satisfaction, which is conducive to higher productivity. The findings in the table, where education significantly moderated the impact of mental health factors such as anxiety traits (AT) and depression disorder (DS) on productivity, support this view.

Moreover, educational attainment often involves learning and developing soft skills such as communication and time management, which are crucial in managing workplace stress and maintaining productivity. Educated employees might better navigate workplace dynamics and seek support when needed, thus minimizing the productivity losses typically associated with mental health issues. The significant moderating effects of education on the relationships between stress behavior (SB), post-traumatic behavior (PT), and workplace productivity further emphasize that education provides tools and frameworks that help manage these challenges effectively. Finally, the positive moderating effects of education on mental health and productivity underscore the importance of integrating educational development into workplace mental health strategies. Organizations that support continuous learning and development may enhance

employees' ability to cope with mental health issues and maintain high productivity levels. This approach benefits individual employees and contributes to an organization's overall success and efficiency.

In summary, this study supports and extends the existing literature by demonstrating that mental health disorders significantly impact workplace productivity, and that education plays a crucial role in moderating these effects. This underscores the importance of considering the educational background when developing workplace interventions and policies to improve productivity and support mental health. Being unhealthy mentally or mentally unfit may lead to severe issues in the workplace, especially if it affects an employee's productivity and ability to perform. Afonso et al. (2022) confirmed that anxiety and depression disorders lead to poor sleep quality. Eventually, inadequate sleep is linked to poor production levels in various professional domains. In this study, it was concluded that anxiety and depression were the two most substantial mental disorders that influence an individual's workplace productivity. The results on anxiety traits were not supported by previous research by Zhang et al. (2022), which stated that anxiety would affect a person's workplace productivity. However, it is vital to note that different job types, which result in various levels of stress, also affect productivity (Timotius & Octavius, 2022). Sometimes a certain amount of stress is required to improve employee performance. Workers undertake their jobs daily, but perform less well because of workloads and time restrictions.

6. Conclusion

This study examines how mental health disorders—specifically anxiety, depression, PT, and stress behaviors —affect workplace productivity and investigates the moderating role of education level. Using data from 161 respondents surveyed via an online questionnaire and analyzed with SmartPLS, the research found that anxiety and depression significantly decreased productivity, while PT and stress behaviors did not. Additionally, educational level moderates these relationships, influencing the impact of mental health issues on productivity. This study highlights the importance of education in managing mental health challenges at work and recommends targeted interventions to improve productivity and well-being.

6.1 Limitations

Quantitative studies on mental health often face limitations, such as reliance on self-reported data, which can be subject to biases, such as social desirability or inaccurate recall, potentially skewing results. Mental health issues are also complex and multifaceted, making it challenging to capture their full scope through standardized measures. Cross-sectional data provide a snapshot rather than capture the dynamic and evolving nature of mental health over time. Moreover, the sample sizes may be insufficient, leading to limited generalizability of the findings. These limitations can affect the robustness and applicability of quantitative mental health research conclusions.

6.2 Implications

The implications of quantitative studies on mental health are significant in both research and practice. These studies can inform the development of targeted interventions and policies by providing empirical evidence on the impact of mental health disorders and moderating effects of factors such as education. They offer insights into how mental health issues affect workplace productivity and highlight the need for tailored support systems and resources. Additionally, findings can guide organizations in designing effective mental health programs and improving employee well-being and productivity. The finding that education moderates the relationship between mental health and workplace productivity has important implications for organizational

policies and mental health interventions. Higher education levels appear to buffer the negative impacts of mental health disorders, suggesting that employees with higher education may have better coping strategies, problem-solving skills, and access to resources that help mitigate the effects of mental health issues on productivity. This underscores the value of promoting educational opportunities and continuous learning within the workplace as part of a broader strategy for enhancing employee well-being and performance.

Additionally, these findings highlight the need for targeted interventions that consider the educational background when addressing mental health issues. Organizations could tailor their mental health support programmes to account for varying levels of education, ensuring that resources and strategies are accessible and effective for employees with different educational attainments. By incorporating education-focused elements into mental health initiatives, employers can support their workforce, reduce productivity losses, and foster a more resilient and productive work environment.

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