Brain Rot as a Mediator of Social Media Use, Mental Well-Being, and Employee Productivity

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Abstract

The rapid advancement of digital technology has intensified the use of social media in daily work activities, yet excessive information exposure may reduce individuals' cognitive capacity. This study aims to analyze the mediating role of brain rot in the relationship between social media use, mental well-being, and employee productivity. A total of 282 active workers in Indonesia participated as respondents through a survey instrument adapted from previous studies, and the data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The results show that social media use and mental well-being have negative effects on brain rot, while brain rot negatively affects employee productivity. Furthermore, brain rot significantly mediates the relationship between social media use and productivity, as well as the relationship between mental well-being and productivity. These findings highlight that declining cognitive capacity serves as a crucial mechanism linking digital behavior and psychological conditions to work performance, offering empirical contributions to the literature on digital overstimulation and its implications in the workplace, while also providing opportunities for future research on interventions to minimize the negative effects of digital content consumption on productivity.

Keywords: brain rot, social media use, mental well-being, employee productivity, PLS-SEM

How to Cite

Introduction

The rapid advancement of digital technology has transformed the way individuals' access, process, and interpret information in daily life. Social media platforms have become essential tools that facilitate communication, information exchange, and work efficiency (1,2). However, continuous exposure to complex and fast-paced digital information also increases individuals' cognitive load. According to Cognitive Load Theory (3), human working memory has limited capacity, and excessive information particularly from multimedia environments can burden cognitive processes and impair deeper reasoning (4). This condition aligns with the emerging concept of *brain rot*, characterized by deteriorating focus quality, reduced deep thinking, and declining cognitive function triggered by overstimulating and fragmented content consumption (4,5).

The prevalence of short-form, highly stimulating, and fragmentary content strengthens the potential for cognitive strain. In this regard, Information Overload Theory explains that individuals who receive information beyond their processing capacity experience reduced attention, decision-making difficulties, and cognitive saturation (6). This mechanism is particularly relevant to digital content environments where users are encouraged to scroll continuously, encounter rapid content transitions, and process abundant, often superficial information (7,8). Meanwhile, the increasing intensity of social media use is also influenced by individuals' reliance on digital platforms. Media Dependency Theory posits that the higher people's dependence on media for information, interaction, and daily functioning, the stronger the psychological and behavioural effects of media exposure (9). In Indonesia one of the countries with the highest social media usage rates this dependency heightens vulnerability to cognitive overload and fragmented attention (10,11).

While prior studies have examined negative outcomes of excessive social media use such as distraction, stress, and attentional decline empirical research specifically conceptualizing *brain rot* as a measurable cognitive construct remains extremely limited. Most existing literature focuses on generalized constructs such as overload or technostress, leaving substantial gaps in understanding how modern forms of overstimulation affect cognitive performance. Moreover, previous findings on social media use are inconsistent; certain studies note that purposeful or task-oriented social media use may still support work interactions, communication, and productivity (12). These mixed results indicate the need to examine how social media use influences cognitive functioning within overloaded digital environments.

Beyond digital behaviour, mental well-being also plays a significant role in shaping individuals' susceptibility to cognitive decline. Individuals with higher mental well-being tend to demonstrate better emotional regulation, attentional control, and resilience against digital pressure (13). Conversely, low mental well-being increases vulnerability to mental exhaustion and information-processing difficulties. The Cognitive Fatigue Model explains that prolonged exposure to cognitively demanding tasks such as dense digital stimulation can deplete mental resources, reduce self-regulation capacity, and diminish attentional endurance (14). Although psychological well-being has been widely studied, empirical works directly linking mental well-being to brain rot as a specific cognitive disruption are still scarce, especially in the context of digitally intensive work environments. In Indonesia, growing digital workload and multitasking demands among workers further reinforce the urgency of exploring this relationship (11).

In addition to these individual-level factors, the rapid global increase in short-form video consumption has intensified concerns about modern cognitive patterns. Platforms such as TikTok, Instagram Reels, and YouTube Shorts promote ultra-fast content cycles that encourage users to process numerous stimuli within very short intervals. Recent digital behaviour reports consistently show that users are exposed to hundreds of micro-content units daily, a consumption pattern that aligns with the mechanisms of cognitive fragmentation described in Cognitive Load Theory and Information Overload Theory. This type of fragmented attention environment conditions the brain to prioritize speed over depth, which reinforces patterns associated with brain rot (4–8).

Furthermore, neuroscientific discussions have raised concerns regarding dopamine-driven engagement loops embedded in social media algorithms. These reward cycles reinforce compulsive scrolling behaviour and reduce the ability to sustain long-duration cognitive tasks, complementing the psychological pathways proposed in the Cognitive Fatigue Model (14). Workers who experience repeated cycles of quick dopamine rewards may struggle to transition back into deep work states, thereby intensifying cognitive fatigue and diminishing productivity over time. This aligns with global observations that modern digital habits may reconfigure attentional stability, especially among younger workers who rely heavily on mobile devices.

The Indonesian context further amplifies these issues. National digital literacy surveys highlight a gap between high usage and relatively low critical consumption skills, suggesting that workers are often exposed to high-volume digital content without adequate filtering capability (10,11). This condition increases the risk of overstimulation, distractibility, and cognitive saturation—central mechanisms underlying brain rot. Coupled with rising organizational demands for multitasking and rapid responsiveness, the digital work environment in Indonesia creates a unique setting in which the interplay among media exposure, psychological well-being, and cognitive functioning warrants deeper investigation.

Given these conditions, strengthening the theoretical integration underlying this study is essential. Cognitive Load Theory explains how excessive stimuli disrupt processing capacity; Information Overload Theory conceptualizes the stress induced by excessive digital information; Media Dependency Theory explains behavioural patterns that intensify media exposure; and the Cognitive Fatigue Model outlines the mental resource depletion caused by sustained cognitive exertion. When integrated, these theories create a comprehensive framework for understanding brain rot as a modern cognitive construct shaped by digital overstimulation. However, empirical research that systematically combines these perspectives especially within non-Western or emerging digital economies remains significantly limited, making the present study timely and relevant.

Declining cognitive capacity has direct implications for employee productivity (15). Cognitive fatigue, reduced focus, and difficulties sustaining attention undermine work performance, task completion, and effectiveness (16,17). While previous studies have acknowledged the relationship between digital overstimulation and decreased productivity, the specific role of *brain rot* as an intermediary mechanism remains underexplored. Limited research has examined how brain rot functions as a cognitive bridge linking social media behaviour and psychological conditions to productivity outcomes.

Based on these gaps, this study aims to analyze the mediating role of brain rot in the relationship between social media use, mental well-being, and employee productivity. Using a quantitative approach with Partial Least Squares Structural Equation Modeling (PLS-SEM) and data from 282 Indonesian workers, this research provides empirical insights into how digital overstimulation influences cognitive decline and productivity in modern work settings. The novelty of this study lies in integrating four theoretical foundations Cognitive Load Theory, Information Overload Theory, Media Dependency Theory, and the Cognitive Fatigue Model to conceptualize brain rot as a contemporary cognitive construct within the digital era. Furthermore, this study contributes to the literature by positioning brain rot as a mediating mechanism linking digital behaviour and psychological well-being to productivity, offering a comprehensive theoretical and empirical understanding relevant to both academic and organizational contexts.

Based on the theoretical explanations presented in the introduction, the first relationship examined in this study concerns the effect of social media use on brain rot. Purposeful and well-regulated use of social media provides several benefits, including enhanced information access and improved connectivity (1,2). However, excessive consumption of rapid, shallow, and fragmented digital content increases the likelihood of information overload (4,18), which burdens individuals' cognitive capacity. This mechanism aligns with Cognitive Load Theory, which emphasizes the limited capacity of working memory (3), and with Information Overload Theory,

which states that information exceeding processing capacity leads to reduced attention and impaired reasoning (6). Furthermore, individuals' dependency on digital platforms as described in Media Dependency Theory intensifies the psychological and cognitive effects of social media exposure (9). Such overstimulation contributes to diminished focus and weakened information processing, characteristics commonly associated with brain rot (5,19). Therefore, higher-quality and more intentional social media use is expected to reduce the likelihood of experiencing brain rot. Accordingly, the first hypothesis is proposed as follows: **Social media use negatively affects brain rot (H1).**

Consistent with the theoretical discussion in the introduction, the next relationship examined is the role of mental well-being in influencing individuals' susceptibility to brain rot. Higher levels of mental well-being help individuals maintain emotional stability, regulate stress, and preserve attentional capacity when faced with intensive digital information exposure (13). Within increasingly demanding digital environments, individuals with lower levels of mental well-being are more likely to experience mental fatigue, concentration difficulties, and diminished ability to filter and process information effectively (20). This mechanism aligns with the Cognitive Fatigue Model, which posits that excessive cognitive demands and continuous stimulation drain mental resources, thereby reducing individuals' ability to sustain focus and perform cognitive tasks efficiently (14). As cognitive resources are depleted, symptoms associated with brain rot such as reduced deep thinking and heightened distractibility are more likely to emerge (5,19). Based on this reasoning, individuals with higher mental well-being are expected to experience lower levels of brain rot. Accordingly, the second hypothesis is proposed as follows: **Mental well-being negatively affects brain rot (H2)**.

Building on the theoretical foundation outlined earlier, the relationship between brain rot and employee productivity represents a critical component of this study. Brain rot reflects a decline in cognitive capacity characterized by reduced focus, increased mental fatigue, and weakened sustained attention resulting from excessive and fragmented digital content exposure (4,5,21). In workplace settings, deep thinking, information processing, and task completion depend heavily on stable cognitive functioning. When cognitive capacity deteriorates, individuals become more prone to distraction, errors, and inefficiency, ultimately impairing overall performance (16). Prior studies further indicate that heightened cognitive load and mental fatigue hinder work effectiveness, slow task accomplishment, and undermine productivity (17,22). Consequently, higher levels of brain rot are expected to correspond with lower levels of employee productivity. Based on this reasoning, the third hypothesis is proposed as follows: **Brain rot negatively affects employee productivity (H3)**.

Drawing on the theoretical relationships established in the preceding sections, brain rot not only serves as an outcome of social media use but also functions as a mechanism explaining how social media use influences employee productivity (5,19). Uncontrolled social media use can trigger distraction, elevate information load, and expose individuals to rapid and fragmented digital content (1,18), which increases the likelihood of experiencing brain rot (4,5). According to Cognitive Load Theory and Information Overload Theory, excessive cognitive burden impairs information processing and attentional control. The resulting brain rot characterized by diminished focus and heightened cognitive fatigue subsequently reduces work efficiency, increases errors, and impairs task completion (12,17,22). Thus, the effect of social media use on employee productivity is not solely direct but can also occur indirectly through variations in brain rot levels. Based on this reasoning, the following hypothesis is proposed: **Brain rot negatively mediates the effect of social media use on employee productivity (H4).**

As previously discussed, brain rot serves as a key mechanism linking psychological conditions and digital behaviors to work-related outcomes. In this regard, mental well-being plays a central role in shaping individuals' resilience to excessive cognitive demands and intensive digital stimulation . Individuals with higher levels of mental well-being are better able to regulate emotions, maintain attentional stability, and manage the cognitive challenges posed by dense information exposure (13). Conversely, low mental well-being increases vulnerability to mental fatigue and reduced

information-processing quality (20), consistent with the mechanisms described in the Cognitive Fatigue Model (14). As cognitive resources diminish, symptoms of brain rot such as reduced focus, heightened distractibility, and weakened deep thinking are more likely to emerge (5,19), ultimately leading to lower productivity levels (16,17). Therefore, the effect of mental well-being on employee productivity may occur indirectly through its influence on brain rot. Based on this reasoning, the fifth hypothesis is proposed as follows: **Brain rot negatively mediates the effect of mental well-being on employee productivity (H5).**

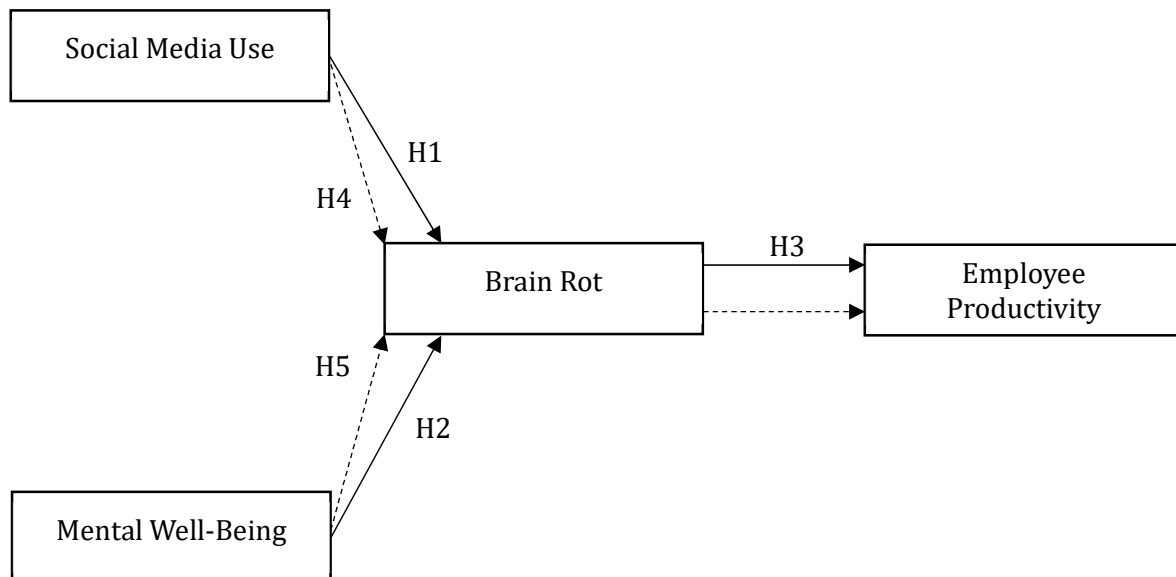The theoretical framework for this study is as presented in Figure 1:

Figure 1. Theoretical Framework

Research Methods

This study employed a quantitative approach using a survey method to analyze the relationships among social media use, mental well-being, brain rot, and employee productivity. The study population consisted of active workers in Indonesia who met the following criteria: having and using social media, working full-time or part-time, being male or female, and being willing to complete the questionnaire in full. A purposive sampling technique was applied to ensure that only respondents who met these criteria were included in the study.

Data were collected through an online questionnaire distributed to eligible respondents. Prior to completing the questionnaire, all participants were informed about the purpose of the study and provided informed consent. All collected data were kept confidential and used solely for academic purposes.

The research instrument consisted of several constructs adapted from previous studies. The brain rot variable was measured using 12 indicators based on Tri Prasetyo (23). Employee productivity was measured using 11 indicators derived from Putri (24). Mental well-being was measured using 9 indicators adapted from Garcia (25), while social media use was measured through 7 indicators developed by Ali-Hassan (26). All indicators were measured using a five-point Likert scale to assess respondents' level of agreement with each statement.

Data were analyzed using Partial Least Squares Structural Equation Modelling (PLS-SEM) with the assistance of SmartPLS software. The analytical procedure included evaluating the outer model to assess construct reliability and validity, as well as evaluating the inner model to examine the relationships among constructs and to test the hypotheses proposed in the study.

Result

Respondents' Demographic Information

A total of 282 respondents participated in this study. Based on gender, 175 respondents (62.1%) were male and 107 respondents (37.9%) were female. Regarding age distribution, 1.1% were 17–20 years old, 46.8% were 21–25 years old, 34.0% were 26–30 years old, 10.3% were 31–35 years old, and 7.8% were above 35 years old.

In terms of education, 0.4% had completed junior high school, 32.3% senior high school, 2.1% diploma, 55.3% bachelor's degree, 9.6% master's degree, and 0.4% doctoral degree. For working experience, 17.0% had worked for less than one year, 23.4% for 1–2 years, 37.2% for 3–4 years, 10.6% for 5–6 years, 3.5% for 7–8 years, 1.8% for 9–10 years, and 6.4% for more than 10 years.

Table 1. Respondents' Demographic

Aspect	Category	N	%
Gender	Male	175	62.1
	Female	107	37.9
Age	17–20 years	3	1.1
	21–25 years	132	46.8
	26–30 years	96	34.0
	31–35 years	29	10.3
	> 35 years	22	7.8
Education	Junior High School	1	0.4
	Senior High School	91	32.3
	Diploma	6	2.1
	Bachelor	156	55.3
	Magister	27	9.6
	Doctoral	1	0.4
Working Experience	< 1 year	48	17.0
	1–2 years	66	23.4
	3–4 years	105	37.2
	5–6 years	30	10.6
	7–8 years	10	3.5
	9–10 years	5	1.8
	> 10 years	18	6.4

Assessment of the Measurement Model (Outer Model)

Table 2. Measurement Model Evaluation: Outer Loadings, Composite Reliability, Cronbach's Alpha, and AVE

Variable	Item	Outer Loading	Composite Reliability	Cronbach Alpha	AVE
Employee Productivity	EP1	0.860			
	EP2	0.869			
	EP3	0.790	0.893	0.876	0.617
	EP9	0.702			
	EP10	0.860			
	EP11	0.750			
Brain Rot	BR1	0.942	0.863	0.659	0.729
	BR2	0.756			
Social Media Use	SMU1	0.923	0.859	0.849	0.868
	SMU2	0.941			
Mental well-Being	MwB1	0.844			
	MwB2	0.828	0.711	0.702	0.630
	MwB7	0.701			

The measurement model was evaluated using outer loadings, composite reliability, Cronbach's alpha, and Average Variance Extracted (AVE). Table 2 presents the outer loadings of each indicator along with the reliability and convergent validity values for all constructs. The results of the outer loadings, composite reliability, Cronbach's alpha, and AVE are presented in Table 2.

Discriminant validity was then assessed using the Fornell–Larcker criterion. The square roots of the AVE for each construct and the correlations between constructs are shown in Table 3.

Table 3. Fornell–Larcker Criterion

Variable	BR	EP	MwB	SMU
Brain Rot	0.854*			
Employee Productivity	-0.343	0.785*		
Mental well-Being	-0.356	0.632	0.793*	
Social Media Use	-0.384	0.289	0.322	0.932*

Note: * = Values in *bold* represent the square root of the AVE.

Assessment of Structural Model (Inner Model)

The structural model assessment was conducted using collinearity statistics, the coefficient of determination (R^2), construct cross-validated redundancy (Q^2), and the significance of the path coefficients. The collinearity statistics were evaluated using the Variance Inflation Factor (VIF), with the results presented in Table 4.

Table 4. Collinearity Statistics Results

Variable	VIF
Brain Rot -> Employee Productivity	1.000
Mental well-Being -> Brain Rot	1.116
Social Media Use -> Brain Rot	1.116

Table 5 presents the results of the coefficient of determination (R^2) and construct cross-validated redundancy (Q^2) for the endogenous variables.

Table 5. Coefficient of Determination (R^2) and Construct Cross-Validated Redundancy (Q^2) Results

Variable	R Square	Q Square
Brain Rot	0.207	0.131
Employee Productivity	0.118	0.072

Hypothesis Testing

Figure 2 and Table 6 present the results of the hypothesis testing, which include the direct effects among variables as well as the mediation effects within the research model. The analysis was conducted by examining the path coefficients (β), standard deviations, t-statistics, and p-values.
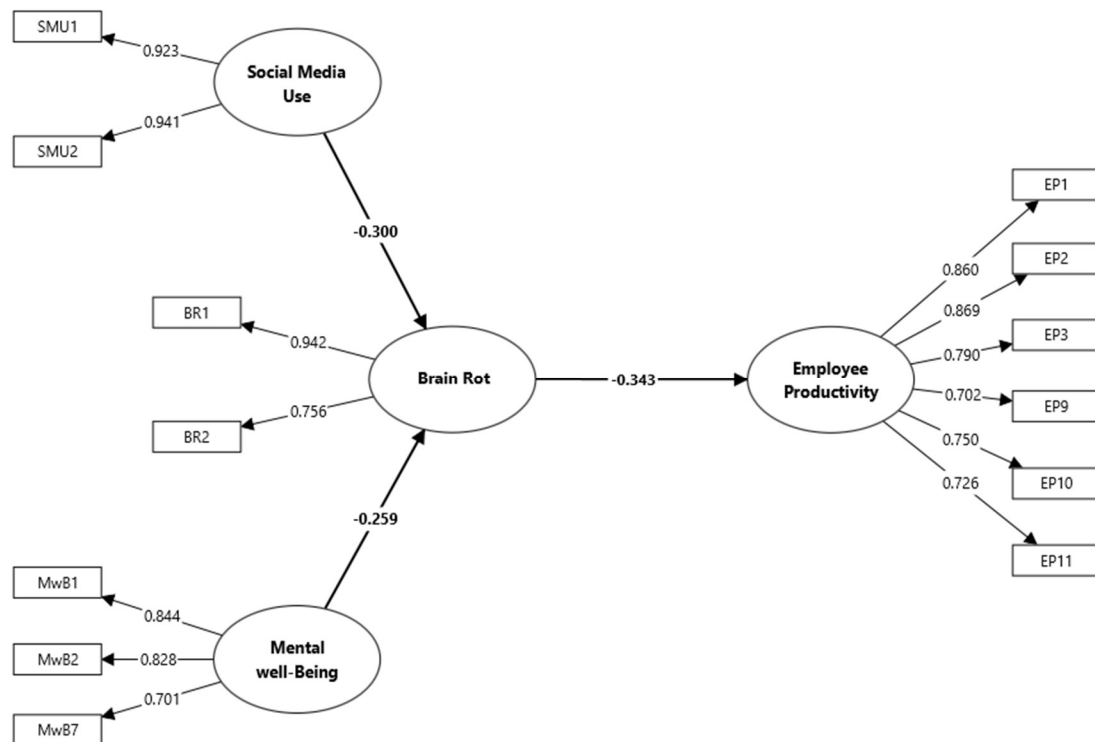
Figure 2. Hypothesis Testing of the Research in the Form of a Research Model

Tabel 6: Hypothesis Testing

Path	β	SD	t-Value	p-Value	Decision
Social Media Use → Brain Rot	−0.300	0.061	4.910	0.000	H1 accepted
Mental Well-Being → Brain Rot	−0.259	0.058	4.425	0.000	H2 accepted
Brain Rot → Employee Productivity	−0.343	0.056	6.143	0.000	H3 accepted
Social Media Use → Brain Rot → Employee Productivity	0.103	0.025	4.105	0.000	H4 accepted
Mental Well-Being → Brain Rot → Employee Productivity	0.089	0.031	2.871	0.004	H5 accepted

Discussion

The results of this study indicate that social media use and mental well-being both exert significant negative effects on brain rot, while brain rot itself decreases employee productivity. These findings align with the theoretical perspective of digital information overload and cognitive fatigue, which suggests that rapid and excessive exposure to fragmented digital content can impair individuals' attentional capacity and information-processing ability. Accordingly, the present study provides empirical evidence that digital overstimulation remains an important factor contributing to cognitive decline among modern workers.

The negative association between mental well-being and brain rot further highlights the protective role of psychological stability in mitigating cognitive disturbances caused by intensive digital environments. Individuals with higher levels of emotional and psychological well-being may be better equipped to regulate stress and maintain cognitive balance, even when frequently exposed to dense streams of digital information. This reinforces prior claims that mental well-being functions as an internal buffer against the cognitive consequences of overstimulation.

The mediation analyses show that brain rot serves as a central mechanism linking both social media use and mental well-being to employee productivity. These results indicate that the decline in cognitive capacity characterized by reduced focus, mental fatigue, and difficulty sustaining attention represents a key pathway through which digital behaviours and psychological

conditions influence work performance. This highlights the importance of considering cognitive integrity as an intermediary factor in workplace productivity models, especially in digitally intensive work settings.

From an organizational standpoint, the findings underscore the need for interventions that help employees manage social media exposure and strengthen mental health resources. Programs aimed at digital literacy, focus management, and mental well-being development may help reduce the risk of cognitive strain and support sustained work performance. Nonetheless, this study is limited by its cross-sectional design and reliance on self-reported data, which restrict causal interpretation. Future research is encouraged to employ longitudinal or experimental approaches to validate the cognitive mechanisms identified and to observe how digital overstimulation evolves over time.

Overall, the study contributes to the growing literature on digital overstimulation by providing empirical support for the role of brain rot as an explanatory mechanism through which digital behaviour and mental well-being affect employee productivity.

Furthermore, the findings of this study reinforce broader global concerns about shifting cognitive patterns in the digital era. Prior research highlights that repeated exposure to fast-paced digital environments can gradually recalibrate attentional habits, making individuals more reliant on quick information bursts and less capable of sustaining prolonged cognitive engagement. The present results echo this pattern, showing that Indonesian workers may be similarly affected by these global cognitive shifts. This adds relevance to ongoing discussions that modern workforces are increasingly vulnerable to subtle but cumulative cognitive degradation, particularly when digital exposure remains unmanaged.

Another important implication lies in the interaction between psychological well-being and digital demands. The current findings suggest that mental well-being does not only influence emotional or social functioning, but also shapes cognitive endurance under high digital stimulation. This aligns with emerging interdisciplinary studies arguing that well-being-related resources—such as emotional regulation and resilience—play a direct role in protecting individuals from cognitive fragmentation. As digital work environments continue to intensify, this study provides further evidence that investments in psychological wellness may translate into measurable cognitive and performance-related benefits.

In addition, the mediating role of brain rot highlights the importance of recognizing cognitive integrity as a distinct occupational resource. While traditional productivity models emphasize skill, motivation, and organizational support, the present study demonstrates that cognitive capacity—particularly the ability to maintain deep attention and resist mental exhaustion—functions as a critical bridge between digital behaviour and performance outcomes. This suggests that future organizational policies should not only regulate digital behaviour but also monitor cognitive health indicators that may serve as early signs of performance decline.

Finally, the findings invite future scholars to broaden the conceptualization of digital overload beyond conventional constructs such as technostress or information overload. Brain rot, as operationalized in this study, captures a more contemporary and ecologically valid form of cognitive disruption shaped by modern digital ecosystems, including short-form video content, algorithm-driven engagement patterns, and continuous micro-stimulation. Expanding empirical exploration of this construct may provide more precise insights into how digital environments influence cognitive functioning in ways that older theoretical models may not fully capture.

Conclusion

This study concludes that social media use and mental well-being significantly and negatively influence brain rot, and that brain rot functions as a key mechanism linking these variables to employee productivity. The findings highlight cognitive decline manifested in reduced focus,

mental fatigue, and difficulty sustaining attention as an essential pathway through which digital overstimulation affects work performance in modern digital environments.

From a practical perspective, the results emphasize the importance for organizations to promote digital literacy, focus management, and mental health support to reduce cognitive strain and sustain employee productivity. Despite its contributions, the study is limited by its cross-sectional design and reliance on self-reported data, which restrict causal inference. Future research is recommended to employ longitudinal or experimental designs to validate the cognitive mechanisms identified and strengthen the generalizability of the findings.

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