

PRIMARY RESEARCH

Unpacking the double mediating effect of FoMO and sleep disorder on the academic success of Moroccan students

Loubna Laraichi^{1*}, Najla Radouani²^{1,2}Research laboratory LaRSLAM, Ibn Zohr University, Agadir, Morocco

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Abstract

Digital connectivity among students in Morocco has led to the rise of social media as a space for individuals to communicate and form communities, while also increasing the risk of failing to achieve their educational goals. Using the Conservation of Resources (COR) theory, this study explores the relationship between Social Media Addiction (SMA) and academic performance. The study will test the moderated serial mediation model, assessing whether social media addiction is related to student grades, and whether FoMO and sleep disorders mediate the relationship between SMA and academic performance, or whether SMA is moderated by social media stress. The research employed a quantitative, cross-sectional design and analysed data from people enrolled in different faculties across Morocco ($n = 412$) using a digital data collection tool (i.e., Google Forms). Using SmartPLS 3.0 software, nine hypotheses (H1-H9) were tested to identify the mediating and moderating relationships in the model. The findings show that social media addiction has a direct impact on academic performance, Fear of missing out, and sleep disorders. Social media stress has a mediating impact on social media addiction and academic performance. Fear of missing out and sleep disorder mediate the relationship between social media addiction and academic performance. Therefore, Moroccan universities will provide all students with the necessary foundation to achieve.

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INTRODUCTION

Many social media-related concepts have emerged during the pandemic and have become part of our everyday lives. FoMO is characterized by anxiety stemming from an individual's need for information, both to keep abreast of what others are doing socially, culturally, and economically, and to receive news as soon as possible (Li, 2024). The amount of information someone receives from social media is closely associated with their ability to experience FoMO. FoMO can also increase a person's feelings of insecurity when they are regularly bombarded with large amounts of information. The COVID-19 pandemic has

had a negative impact on all people globally. In short, the influx of misinformation from social media is often seen as the cause of panic and chaos whenever social information flows are disrupted in a community (Groenestein et al., 2024).

As such, FoMO is a concept that continues to evolve in the context of social media. The ability of social media to provide immediate access to information raises the potential that people will doubt what is real and may receive false or misleading information from intentional or unintentional sources. Social media is increasingly being viewed as an essential tool for obtaining information

*corresponding author: Loubna Laraichi

†email: Laraichiloubna5@gmail.com

and developing healthy relationships. At the same time, fear of missing out on new information has caused many users to be more engaged on social media than ever before. Unfortunately, one potential result of maintaining a high level of involvement with social media is the development of an addiction to using social media (Abdullahi et al., 2024). Users can get overwhelmed trying to keep up with the massive, ever-evolving amount of information available to them on their mobile devices and computers Li (2024), and research supports this as a reason for increased SMA.

In recent years, the rise of digital technology has fundamentally transformed the university student experience, making social networking platforms an integral part of both their academic and social identities (Zhu et al., 2023). While leveraging these platforms allows for greater access and connectivity to networks and information, they represent a cumulative risk to the well-being of students and, ultimately, student performance, both as an academic measure of academic performance being the most important indicator of whether a student is meeting their university's academic learning objectives, and as a totality of engagement and completion of tasks necessary to successfully meet their university's degree requirements typically, improving on complex tasks, and comprehensive exam completion.

Several different aspects have been linked to affecting sleep. Some examples of these are: Nutrition is believed to help determine how an individual sleeps, supports physical activity Dodet et al. (2024), stress on the shoulder and disability.

The person's physical environment, and the person's social environment (Zhu et al., 2023). The individual's emotional state is another important factor in determining how well a person sleeps; thus, different emotions can lead to the development of a sleep disorder (Ramos et al., 2023). Sleep disorders are considered physiological conditions caused by disruptions in the regularity mechanisms of the sleep/wake cycle and are typically associated with insomnia, sleep deprivation, poor-quality sleep, and daytime impairment (Gottesman et al., 2024). A sleep disorder disrupts our healthy sleep pattern. A typical bio-

logical relationship is that blue light from screens inhibits melatonin production, and psychological arousal from social media interactions inhibits the brain from reaching a restful state (Hamdani et al., 2023; Zhu et al., 2023). The absence of restorative/deep sleep serves as the physiological pathway linking late-night social media use to cognitive impairment in the classroom.

Social media stress is the psychological strain and perceived responsibility associated with maintaining a digital identity (Alhrahsheh & Al Majali, 2023). It can also be defined as a result of having to respond to messages quickly, the burden of social comparison, and the problem of "technostress" or overload of information from many different sources at once. Social media stress isn't the direct cause of social media addiction, but rather it amplifies the extent of the effects of the addiction (Jabeen et al., 2023). Students who have a high level of social media stress may experience a greater decline in academic performance than students who are also addicted to social media, but the amount of stress they feel is lessened. Social media stress is a construct that can serve both to quantify excessive social media use and to quantify the negative affect someone experiences from excessive use due to demands to process information (Sundvik & Davis, 2023).

This investigation is highly important because it highlights the complexity of developing strategies to reduce educational and mental health issues among digital users in Morocco. It provides a detailed pathway of how SMA can cause FoMO, leading to excessive sleep disorders, which in turn, reduce a student's ability to be academically successful. The findings of this research will also provide appropriate, research-based resources to allow Moroccan Universities to implement specific cognitive-behavioral sleep strategies through sleep hygiene workshops and psychological counselling for anxiety associated with technology usage. Additionally, this investigation identified social media stress as a moderating variable, enabling educators to better identify which students are most at risk of academic failure. There is evidence that social media addiction among youth has reached an epidemic level, and the relationship between

social media addiction and fear of missing out and sleep disorders is vital to understanding academic performance in students.

LITERATURE REVIEW

Conservation of Resources (COR) Theory

The Conservation of Resources (COR) Theory suggests that people have a fundamental need to acquire, keep, secure, and promote "resources", and these "resources" are things that people value (Hobfoll, 2001). When threatened or depleted of resources, people feel stress, which creates a "loss spiral": An individual who experiences a loss then loses other "resources", making them much more susceptible to stress from future losses (Ahmed et al., 2024; Hobfoll et al., 2018). In other words, COR Theory states that a student has a limited capacity for time and cognitive effort to perform academically, and therefore, when they compulsively and continuously use social media to satisfy their desire for social belonging, they are investing their limited time and cognitive effort in social media. Therefore, students' overuse of social media at night due to FoMO depletes their Sleep resource, which is essential for restoring a student's ability to handle the cognitive demands of university (Hobfoll et al., 2016). According to COR Theory, the continual loss of a resource makes the individual who lacks it vulnerable to further losses. Students currently suffering from Social Media Anxiety are rather ill-suited to handle the psychological pressure associated with digital technology. As social media stress increases, it causes the addition between the students' addiction to social media and academic failures to intensify, as students who suffer from social media stress no longer have the emotional and/or physical resources to offset the deterioration of their academic performance due to the addiction (Chan et al., 2022). The final decline in grades represents a "resource bankruptcy" situation for a student whose cumulative losses of time, sleep, and concentration preclude her/him from achieving the necessary academic goals for success (van der Schuur et al., 2019).

Social Media Addiction

Social media is a rapidly evolving technology, and people have almost instant access to information about what others are doing (Zhao, 2023). The ability to access information instantaneously through the use of SMPs can place those who use SMA in a position where they develop feelings of FoMO because they feel pressured to keep current with the news/societal information to remain relevant and connected to society, which in turn creates a greater likelihood of using SMA more and more frequently to obtain information Aslan and Polat (2024), interact with others socially and develop/maintain personal networks (Kim et al., 2024). A researcher reports that nearly 42% of Moroccan youth experience declining academic performance, largely due to excessive use of digital media. Such studies have demonstrated that the time students spend on social media correlates with their academic performance, as they often check their accounts rather than completing homework or studying (Kim et al., 2024). Abdullahi et al. (2024) found a positive correlation between the rates of addiction for medical students and their grade point averages. The virtual world can disrupt a student's ability to focus on academic coursework, leading to lower GPAs. Zhu et al. (2023) describe how the constant influx of information may lead to the development of psychological dependence and subsequent fears of being disconnected at any point in time. Sundvik and Davis (2023) suggested that addictive behaviors increase an individual's perceived need to stay in touch with current events, with social media platforms serving as the primary lens through which they view their social standing and value relative to peers.

The digital addiction among nursing students in Meknes, Morocco (81.15%) is in direct correlation with sleep quality (86.6%) where the physical 'blue light' emissions interfere with the production of melatonin, and the psychological arousal caused by interactions with social media during late-night hours hampers their ability to transition into a deep state of restorative sleep (Abdullahi et al., 2024; Zhao, 2023). Relative to studies conducted globally, where Smartphones and social media have been found to cause unhealthy sleep habits by delaying sleep onset,

Jabeen et al. (2023) suggest that Moroccan undergraduate students who use their mobile phones as the main educational and social tool after dark are particularly susceptible to insomnia and excessive daytime sleepiness as a result. Social media use has been identified as a potential avenue for enhancing learning; however, due to the high levels of 'techno-stress' experienced by Moroccan students, their smartphone use could shift toward the 'Addiction' end of the continuum (Caratquit & Caratquit, 2023; Farhadi, 2024). Song et al. (2023) will provide an early-stage framework to help understand how digital use has become a major contributor to students' overall success. Unlike Saudi Arabia, where Gender was identified as one of the primary factors, Zhao (2023) suggests that the 'Loss Spiral' of addiction leading to FoMO, resulting in sleep deprivation, which ultimately leads to academic failure, occurs universally within the student.

H1: Social media addiction has a direct impact on academic performance.

H2: Social media addiction has a direct impact on fear of missing out.

H3: Social media addiction has a direct impact on sleep disorders.

Social Media Stress as a Moderator

Social media is frequently associated with stress due to several factors, such as constant communication, pressure to maintain an online persona, and the urge to compare oneself to others (Kim et al., 2024). Social media stress is a critical moderating variable for the negative effect of social media addiction on academic performance. Zhao (2023) states that a person experiences stress when they feel that their valued resources are threatened or lost. Some resources that are lost as a result of social media addiction for university students are time and mental energy. However, once social media stress is taken into consideration, it leads to a "resource loss spiral" Sundvik and Davis (2023) that exacerbates the negative consequences of addiction and creates an effect that further hinders students' ability to disengage from social media to concentrate on academic responsibilities.

Song et al. (2023) indicated that while some students can

cope with high levels of digital use and still do not experience negative academic performance, others who feel increased stress from their digital interactions may experience an abrupt decrease in cognitive production capacity. When it comes to social media, Ngien and Jiang (2022) found that social media stress serves as a catalyst, with a greater effect on functional impairment among individuals with high sensitivity to social media stress than among those who consider social media a low-stress environment. This indicates that the "stress" of being online is as detrimental to a student's grade point average as the amount of time spent on those platforms. When students experience extreme social media stress, their "resilience resources" become drained, leaving them unprepared for the time lost due to the addiction. When this happens, there will be a moderating effect between the addiction-performance (Merrill, 2022). The slope of the addiction-performance relationship will become increasingly steeper. This is different from research on addiction in the absence of other factors. van der Schuur et al. (2019) concluded that the psychological stress of remaining "connected" worsens the academic effects of excessive social media usage. Therefore, social media stress does not simply coexist with addiction; it increases the impact of the addiction on a student's academic success.

H4: Social media stress moderates the relationship between social media addiction and academic performance.

Fear of Missing Out As Mediating

Addiction to a device creates a behaviour pattern, whereas FoMO generates an emotional drive that leads students to deprive themselves of proper sleep for the sake of social connections with peers (Rahardjo & Soetjningsih, 2022). In this sense, addiction establishes a regular pattern of use while FoMO creates a sense of urgency to remain connected with peers regardless of when this connection occurs. The link between FoMO, compulsive smartphone use, and poor sleep hygiene has been established by Chan et al. (2022), who identified FoMO as a link between psychological "need to belong" and biological "need to sleep". The inter-relationship between addiction

to devices and FoMO creates situations in which FoMO disrupts cognitive flow and interrupts study time by inducing anxiety about social conditions and, thus, eroding the quality of study produced. Soriano-Sánchez (2022) found that Students who scored high on FoMO had a significantly greater risk of cognitive interference while studying and subsequently had significantly lower test scores than those who engaged in social media use but did not have the emotional impact of FoMO.

Jabeen et al. (2023) researched the impact of digital technologies on individual health in Western contexts. However, recent research from North Africa reveals that the more collectivist nature of this culture amplifies the ability to mediate FoMO (Zhu et al., 2023). Because of the importance placed on being in sync with others in this culture, feeling that one has missed out on an opportunity to attend a social event can lead to stress. The main mechanism by which one's habit of using digital devices leads to academic failure is the diversion of the emotional and cognitive resources needed to achieve educational objectives. The SMA does not have a singular effect on one's university student life (Bläse et al., 2024). Groenestein et al. (2024) identify FoMO as one such critical intervention point; if these institutions could provide support for students in managing the psychological pressure of having to keep up with their peers, they would likely mitigate the relationship between digital addiction and those negative effects that have been well documented (e.g., sleep deprivation, poor grades). Kovan et al. (2024) provide a strong rationale for taking a multidimensional approach to student wellness that incorporates both behavioural and social anxiety components.

H5: Fear of missing out has a mediating role between social media addiction and sleep disorder.

H6: Digital engagement mediates the relationship between governance effectiveness and usage of digital services.

Sleep Disorder as Mediating

Studies show that SMA has led to "sleep displacement," in which students delay going to bed to continue interacting with their digital devices, and to "cognitive arousal,"

which results in excessive brain stimulation and prevents restful sleep. Sleep disruption not only takes away study time; it actively reduces the brain's ability to perform during the day (Sundvik & Davis, 2023). Zhao (2023) found that, among Moroccan university students, the adverse effect of smartphone addiction on academic performance is significantly associated with reduced sleep quality, which in turn negatively impacts memory consolidation and executive function. Psychological pressure to remain socially in sync with their peers creates a "vulnerability period" immediately prior to sleep (Abdullahi et al., 2024). Students who experience high FoMO levels are particularly likely to spend late-night hours "scrolling" on their phones to deal with their anxiety, therefore, shortening their duration of sleep and damaging sleep efficiency. Previous studies by Kovan et al. (2024) suggest that cognitive exhaustion resulting from FoMO-related sleep deprivation is associated with a decline in GPA. These students are physically present in the classroom but lack the requisite alertness to understand and process complex material, suggesting that the primary physical resource depleted by FoMO is sleep before academic failure (Ramos et al., 2023). Dodet et al. (2024) indicate that the relationship between sleep duration, social media addiction, and fear of missing out can be conceptualized as being mediated by a sleep disorder, making sleep disorders an important mechanism by which the digital habits of Moroccan undergraduates result in poor academic performance. Therefore, although psychological factors are involved in achieving academic success, biological factors also play a pivotal role (Seiger et al., 2024). If a student has a social media addiction or experiences FoMO, the associated sleep deprivation represents a cognitive tax that they incur and must repay when they attend classes the following day (Gottesman et al., 2024). These findings support the need to educate students on better sleep hygiene practices for improved student outcomes through academic advising. Thus, university personnel implement interventions to improve students' sleep quality; these efforts may interrupt the relationship between anxiety related to their digital behaviours and lower academic performance.

H7: Sleep disorder has a mediating role between social media addiction and academic performance.

H8: Sleep disorder mediates the relationship between fear of missing out and academic performance.

Dual Mediation

Social media addiction starts with creating a negative behavioural dependency that increases fear of missing out, which creates psychological instability for students and keeps them mentally "stuck" to their devices (Aslan & Polat, 2024). This psychological state of arousal inhibits them from getting restorative sleep while also providing students with an environment in which they do not receive enough restorative sleep to handle the physiological issues that result from anxiety about what others are doing on social media (Jabeen et al., 2023). Social media addiction occurs when users rely on social media platforms so heavily that they feel compelled to engage with them whenever possible. Individuals use social media platforms daily, leading to neglect of other aspects of their lives (Zhu et al., 2023). Furthermore, within a short time, individuals may develop habits of using SMA more than they should, form friendships based on common interests on social media, or build connections through social media platforms (Abdullahi et al., 2024). The phenomena of "Fear of Missing Out" (FoMO) and the ability for individuals to connect through social media contribute to the development of SMA (Bui et al., 2022). FoMO drives a person to keep up with the minutiae of what their "friends" are doing, and this constant need for reassurance can lead to an individual checking social media platforms for news about everyone they know at least

several times each day (Soriano-Sánchez, 2022).

Malak et al. (2022), shows that since social media has made it easy for students to spend more time away from their studies by giving students a sense of lack of urgency to do so by using social media as a time-displacement of their study hours; however, as suggested through the research of Jabeen et al. (2023) and Song et al. (2023), the exhaustion caused by the cognitive and physiological issues produced by the FoMO-sleep connection is a much stronger predictor of academic downfall in comparison to just spending excessive time using social media at a distance from the classroom. This creates a situation where students are in a psychological battle against their anxiety of missing out on things happening at any given moment, coupled with a biological battle of continuous and extreme exhaustion that makes it likely they will be unable to engage in effective academic performance (Kovan et al., 2024). Many students have experienced difficulty sleeping. Many college students (over 76%) surveyed reported having sleep difficulties sometimes. University-level students are using social media significantly more than in previous decades, thus creating the potential for an increase in psychological issues due to increased social media overusing, digital fatigue, FoMO, and cyber victimization on the sleep quality of university students, and subsequently damaging students' academic performance, mental health, well-being.

H9: Fear of missing out and sleep disorder have a double mediation between social media addiction and academic performance.

The study's proposed model is shown in Figure 1.

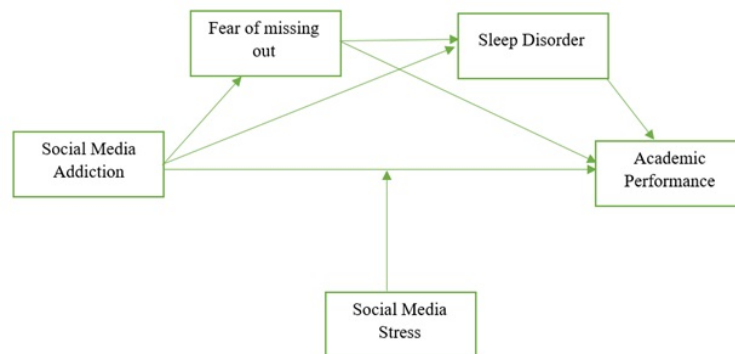


FIGURE 1. Conceptual framework

RESEARCH METHODOLOGY

Research Design

The research design is quantitative and cross-sectional, examining the relationship between social media addiction and academic performance, including both success and failure. A moderated mediation/sequential mediation model has been developed to explore how social media addiction may affect academic achievement by means of FoMO (Fear of Missing Out) and sleep disorders, and also examines the impact of social media-related stress on this pathway. As such, the design provides a statistical basis for assessing both direct and indirect effects of these relationships in a single comprehensive model.

Sampling and Data Collection

A power analysis was conducted to determine the sample size required to achieve the desired statistical power. Using G*Power the power analysis determined that at least 134 responses will give a statistical level ($p < .05$) and power of $(1 - \beta) = .95$ for medium effects. To improve

generalizability and the reliability of the research findings, 412 undergraduate students were recruited from different faculties in Morocco. Data were collected via a digital survey administered via student groups at the university and on social media sites. Participants received an informed consent form that explained the purpose of the research and their rights. All participation was voluntary, and all participants remained anonymous in accordance with ethical guidelines.

Demographic Profile

The final sample comprised 412 students currently enrolled in undergraduate programs at various universities in Morocco. Most of the sample (80%) were female and were around 20 years old. This indicates that the majority of respondents are young adults and thus, are very active in a digital environment. The majority of respondents spend an estimated 3 to 6 hours per day using social media.

TABLE 1. Demographic profile of respondents

Variable	Category	Frequency (n)	Percentage (%)
Gender	Female	330	80%
	Male	82	20%
Age	18–30 Years	Mean = 20.31	SD = 2.29
Education Level	Undergraduate (Year 1)	124	30.1%
	Undergraduate (Year 2)	136	33.0%
	Undergraduate (Year 3+)	152	36.9%
Time Spent Daily	Low (Less than 2 hours)	19	4.7%
	Moderate (3–6 hours)	294	71.2%
	High (More than 6 hours)	99	24.1%

Measures

Social Media Addiction (SMA) was assessed using a 6-item scale based on the Bergen Social Media Addiction Scale and included measures of compulsive behaviours and difficulty controlling social media use (e.g., "You have thought a lot about social media"). All items were rated on a 5-point Likert scale (Kovan et al., 2024). The fear of missing out (FoMO) was assessed through a 10-item scale Kovan et al. (2024) (e.g., "I feel anxious when I haven't heard what my friends are doing"). The FoMO

scale uses a 5-point Likert scale (1 = not at all true, 5 = extremely true) to measure levels of FoMO. Sleep disorder was measured using a 7-item scale assessing sleep quality, sleep latency, sleep duration, and habitual sleep efficiency. Measuring the Social Media Stress, consisting of a five-item scale (van der Schuur et al., 2019). Items include, "Have you felt tense or restless when you knew you received a social media message but could not look at it immediately, and have you felt disappointed when you had not received a message on social media?" Aca-

demic Performance was determined by a 7-item scale (Saffarieh et al., 2022). For example: 'Learns material quickly', 'Does not need to be reminded to focus', and 'How long it takes to finish assignments'.

RESULTS

The Smart PLS 3.0 software program was used to evaluate the data for this study. Analyzing the data's VIF values helps determine whether the research was conducted under conditions of normal fluctuations. Based on the positions of the VIF values relative to the desired values and the results of the normality analysis, it was determined

that the normality condition had been satisfied. Additionally, all data collected from all scales are analysed separately, and confirm the compatibility of the data sets.

Data analysis was conducted to determine the construct reliability and convergent validity of the model in this study, which examined the relationships among variables. The criteria for evaluating convergent and discriminant validity were also included in this analysis. To assess construct reliability, the following measures were utilized: Cronbach's alpha, rhoA, and composite reliability (Henseler et al., 2015). These reliability measures are summarized in Table 2.

TABLE 2. Validity and reliability measures

Variables	Cronbach's Alpha	Rho_A	Composite Reliability	AVE
Academic Performance	0.911	0.912	0.929	0.652
Fear of Missing Out	0.903	0.908	0.920	0.536
Sleep Disorder	0.849	0.864	0.886	0.532
Social Media Addiction	0.912	0.913	0.932	0.695
Social Media Stress	0.874	0.892	0.908	0.666

The study also examined the model's discriminant validity. In evaluating the mean-variance values presented in Table 3, the highest value within each column must be greater than all of the other values in that column in order

to establish construct validity (Fornell & Larcker, 1981). The analysis of Table 3 shows that some forms of partial discriminant validity were present in the data.

TABLE 3. Discriminant validity

Variables	AP	FoMO	SD	SMA	SMS
Academic Performance	0.807				
Fear of Missing Out	0.689	0.732			
Sleep Disorder	0.617	0.676	0.730		
Social Media Addiction	0.654	0.637	0.695	0.833	
Social Media Stress	0.660	0.544	0.515	0.637	0.816

The authors of this study have established the Hetero Trait-Mono Trait correlation as a means for assessing how well the model differentiates itself from other models. Henseler et al. (2015) state that the Hetero Trait-Mono

Trait correlation should be less than 1 in order to validate their findings for the Model. In light of Table 4, the Hetero Trait-Mono Trait correlations are less than 1 as proposed by Henseler et al. (2015) as indicated by Table 4.

TABLE 4. HTMT

Variables	AP	FoMO	SD	SMA	SMS
Academic Performance					
Fear of Missing Out	0.751				
Sleep Disorder	0.687	0.774			
Social Media Addiction	0.814	0.796	0.792		
Social Media Stress	0.724	0.832	0.834	0.732	

SRMR and RMSTheta were two indices we used to evaluate our model's structural properties, along with an SRMR value near zero (Henseler et al., 2015). According to Henseler et al. (2015), SRMR values below 0.08 indi-

cate a good model fit. As shown in Table 5, the SRMR and RMSTheta values met the requirements for a good fit to the model.

TABLE 5. Model fitness

	Saturated Model
SRMR	0.069
RMS Theta	0.191

To determine how well the independent variables explained the dependent variable, we examined the R^2 val-

ues for each independent variable in the model. Based on the findings shown in Table 6.

TABLE 6. R-Square

	R Square
Academic Performance	0.616
Fear of Missing Out	0.542
Sleep Disorder	0.636

In addition, the study collected data on the relationships among the hypotheses of the different constructs in the conceptual framework. The study tested the relationships between the dummy-coded exogenous variables

and the endogenous variables by creating a sampling structure of 5000 replications and 5000 subsamples using SmartPLS during data collection. As shown in Table 7, not all hypotheses were significant ($p > .05$).

TABLE 7. Hypothesis testing

Relationships	Beta Values	Sample Mean	Standard Deviation	T Statistics	p Values
H1: SMA -> AP	-0.622	-0.630	0.085	7.300	0.000
H2: SMA -> FoMO	0.737	0.741	0.031	23.610	0.000
H3: SMA -> SD	0.270	0.259	0.077	3.503	0.001
H4: SMS * SMA -> AP	0.118	0.118	0.055	2.166	0.031
H5: SMA -> FoMO -> SD	0.425	0.436	0.060	7.042	0.000
H6: SMA -> FoMO -> AP	-0.270	-0.268	0.070	3.883	0.000
H7: SMA -> SD -> AP	-0.212	-0.211	0.077	2.722	0.007
H8: FoMO -> SD -> AP	-0.226	-0.222	0.085	2.750	0.004
H9: SMA -> FoMO -> SD -> AP	-0.319	-0.316	0.076	3.742	0.008

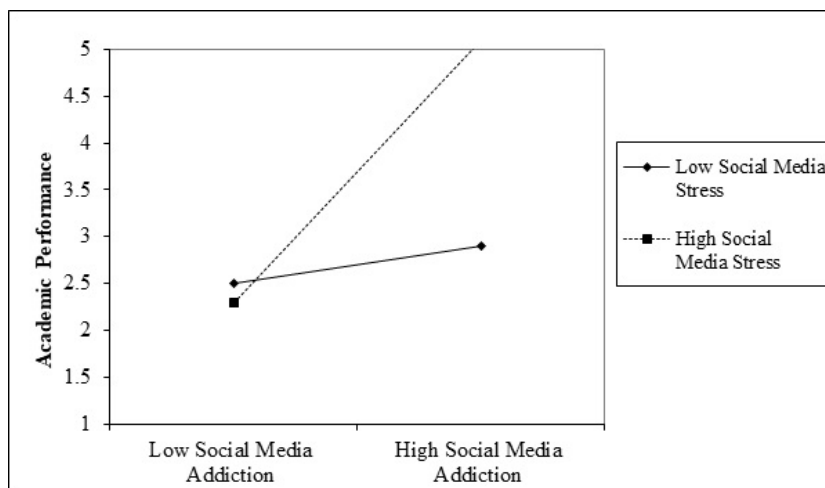


FIGURE 2. Moderating effect of social media stress

DISCUSSION

This research provides a complete overview of the digital lifestyles of Moroccan undergraduate students and demonstrates that social media addiction is the primary cause of their academic deterioration. The Conservation of Resources (COR) Theory utilizes the idea of 'finite psychological and physical resources' to help us understand this phenomenon. When students' time and emotional energy are absorbed by social media, they experience a depletion of these resources, leading to declining mental well-being and physical health, ultimately resulting in low academic performance.

Evidence supports that SMA has a significant negative impact on students' academic performance. From a COR perspective, SMA directly impacts academic performance through depletion of primary resources; time and cognitive ability spent using SMA depletes time and cognitive ability available for academic tasks. This finding corroborates the results, which indicate that medically addicted medical students show significantly less productivity. While there are few studies to date on the relationship between SMA and academic performance, most researchers agree that fatigue and sleep problems are associated with SMA. In addition, research demonstrates that sleep disturbances are a significant contributing factor to fatigue in both students and working individuals who exhibit depressive symptoms.

The findings suggest that SMA has a significant positive

impact on FoMO. Participants who used social media very often reported a higher fear of missing out. Applying the conservation of resources theory to FoMO as it relates to students i.e. students addicted to socially connected digital social capital become overly vigilant about preserving their resource, which translates to having a stronger fear of being left behind with regards to social status or social information, mirrors the results of the previous research by Kovan et al. (2024) who identified social media addiction as antecedent to social anxiety in a sample of Moroccan students, thus creating a psychological tether to being offline creating an increase in both perceived social risk and degree of social capital. However, participants' FoMO did not appear to affect their sleep quality or the time they spent sleeping in this study. There is evidence that social media users may have disrupted their sleep patterns due to preoccupation and fear of missing out on social media content. Some evidence suggests that FoMO predicts shorter sleep duration because adolescents use social media later into the night.

This research indicates that social media addiction has a detrimental effect on sleep quality. Regarding sleep quality, previous studies, including, have shown that nighttime use of electronic devices negatively affects sleep onset time and melatonin secretion among Moroccan nursing students. Additionally, university students who spend more time using social media for recreational purposes may find it distracting and interfere with their aca-

ademic performance, which may also lead to later bed-times. Moreover, the data collected from this survey supports previous studies showing a relationship between excessive social media use compared with interaction with ‘real’ world people and sleeping disorders. Similarly, studies indicate that persons who report poor self-rated health and lower levels of education are at increased risk of poor-quality sleep, as indicated by survey responses. The data also suggests that minorities may be especially vulnerable to the adverse effects of poor health and prolonged use of social media on sleep quality.

Social media-related stress was found to moderate the relationship between SMA and academic success. Based on the COR principle, it explains how one way a student can have less resilience to digital social media-related stress is through previous addiction and related stressors that have created an environment of “not having enough.” This would indicate that as social media addiction continues to grow, it becomes harder for students to perform well academically, and this will significantly worsen the overall impact of addiction on academic performance. For students who face a lot of digital stress, it can act as a “multiplier” amplifying the negative impact of their social media addiction on their grades. A research conducted research to help organisations understand these relationships between digital social media stress and online stress. Conducting an experiment on the effects of real-time social media stress will provide evidence of how the timing of mood recovery, i.e., post-stress, is affected by social media addiction and academic performance. Using physiological measures, such as sleep disturbance, during periods of extreme social media stress reduction may shed light on how AP affects mood recovery.

According to this research, the connection between SMA and sleep disorder was mediated by FoMO. This implies that the motivation for staying up physically stems from psychological fear. The COR theory describes this conflict as a “maladaptive resource allocation,” in which an individual invests their physical recuperative resources in social inclusion. This is supported by Dodet et al. (2024), who found that social anxiety is the leading reason why addicted individuals cannot sustain healthy

sleep hygiene. Other researchers have also established a link between SMA and decreased sleep quality (Gottesman et al., 2024), which aligns with our findings. Furthermore, the factors that may contribute to the sleep disturbance caused by SMA are the use of devices in conjunction with the ease of access to Wi-Fi without restrictions concerning time and place, which allows a person to take their smartphone into bed with them and to use social media prior to going to sleep, which may prevent them from falling asleep or may cause them to have a later bedtime.

The relationship between social media addiction and academic performance is considerably mediated through fear of missing out. While SMA creates the pattern, FoMO causes the distraction. FoMO is the mental state of ‘being in more than one place at once,’ which leads to a lack of concentration that is necessary for academic performance. Kovan et al. (2024) found similar results when students with higher social anxiety had more frequent interruptions in their academic work. In Moroccan culture, disconnecting from a socially synchronized state creates distance between individuals and classroom participation. Groenestein et al. (2024) argue that, because of FoMO, people will access SMA more often and for longer periods than they would without FoMO. This is because the feeling of needing to monitor others’ lives and activities keeps individuals in a constant state of checking in on their SMA. Because of this continuous attachment state and behaviour, performance is hampered, leading individuals to spend more time online and thereby increasing SMA.

The mediating elements of sleep disorder in the relationship between SMA or FoMO and academic performance. According to Dodet et al. (2024), being deprived of sleep affects the student’s cognitive resource capacity; therefore, due to their inability to consolidate memories and solve problems, academic performance will decline. Gottesman et al. (2024) found that sleep quality among Moroccan students is a much stronger predictor of grade point average than overall time spent studying. Without sleep, the “resource reservoir” depletes, directly impacting academic performance. FoMO creates a state of

“stress arousal,” thereby preventing restorative sleep and depleting an individual’s need for cognitive resources in the classroom. The researcher stated that insomnia associated with social anxiety is a contributing factor to a student’s low levels of alertness and engagement. In other words, a greater level of addiction to smartphones corresponds to a higher level of sleep disorder. Therefore, as college students spend more time on their smartphones, they will subsequently sleep less. The initiation of sleep, fluctuations in mood, and awakenings during sleep have major implications for sleep quality.

Ultimately, results indicate through serial mediation under the COR theory. Addiction starts as a catalyst to generate a reaction, which ultimately results in a loss of both physical wellbeing/health and academic performance. A researcher indicate that if an individual has experienced overall depletion of their psychological resources, they should experience a decline in performance. In addition, short sleep duration and poor sleep quality have been shown to increase fatigue brought on by social media. There are relatively few studies examining the connection between SMA and insufficient sleep, but a number of studies to date suggest a correlation between fatigue and sleep-related issues. Evidence indicates that some of the sleep disturbances experienced by students experiencing depression or students studying could be major contributors to their feelings of fatigue.

Theoretical and Practical Implications

Drawing on this study, we build on the existing body of research on the conservation of resources theory and apply it directly to students’ digital behaviour. In addition, the research demonstrates that while SMA consumes a student’s time and mental resources early on, it also consumes their psychological (FoMO) and physical (sleep) resources. This shows that resource losses, especially in time and mental energy, are sequential in the digital world. The addition of Social Media Stress as a moderator demonstrates that the losses incurred by SMA are not uniformly negative or positive across the entire population, as SMA creates a significantly greater loss for people experiencing additional sources of stress. Prior to this

study, research on FoMO and sleep was often limited to the individual effects of technology on sleep or on FoMO (Kovan et al., 2024). This study identifies how these variables interact to impair academic achievement. Furthermore, this study supports the hypothesis that FoMO and sleep disorders are not merely incidental to smartphone use; rather, they are integral parts of the pathway linking digital behaviour to poor academic performance. This study makes an important contribution to the field and will serve as a foundation for future researchers in the Maghreb region, supporting a more comprehensive, multidimensional approach to research on the effects of technology on human capital development.

This study calls for Moroccan higher education systems to implement SMA alongside standard academic advising. Due to the chain of causation between psychological anxiety and physical exhaustion, the interventions universities used must be multifaceted. An example of this would be university counseling center workshops specifically related to sleep hygiene and the mitigating effects of FoMO. University counselors and advisors should encourage students to build “resource resilience” and assist them in managing their social anxieties, such as disconnecting from peers, as well as the physical effects of late-night technology use. Moreover, the findings of this study strongly indicate to university administrators that they should incorporate digital literacy and stress management resources into all aspects of their student orientation processes. Since social media stress has a significant moderating effect on the success of college students, universities might consider creating “tech-free” spaces and designated areas within libraries, and residential housing where students can retreat to while maintaining their ability to connect via phone/network, and allow for recovery/restorative time. The combination of improved sleep quality, FoMO, and other aspects of students’ wellness will enable an institution to foster an environment where students learn to navigate the rigours of their academic programmes. This proactive approach will help ensure that the Moroccan educational system’s digital transformation enhances student advancement rather than becomes a hurdle to academic excellence.

Limitations and Future Directions

Although this research provides valuable insights into how Moroccan students interact with technology, it also has several limitations. The first is the limitations of the cross-sectional research design, which makes it impossible for the research to identify any causal relationship between FoMO (Fear of Missing out), social media, sleep disorders and academic performance, Future Studies should take a longitudinal approach to track the changing nature of these behaviors over the multiple years of student's academic careers, especially to assess the evolution of digital behaviors in students from their first year until they graduate.

Secondly, because of the characteristics of the sample used in this study, the results cannot be generalized to the population as a whole due to the overwhelming skew

towards the female gender (80%). The skewed gender composition may indicate that female students are more likely than male students to respond to surveys on digital behavior, or that specific digital behaviors are underrepresented among male students in Morocco.

Future Research to employ mixed-methods research designs in future studies that seek to include the experiences of limited-resource Moroccans through qualitative interviews and incorporate objective data sources (e.g., app-usage tracking software, clinical-usage monitors). Future studies should also examine the role of culturally specific moderators in the Moroccan context (family dynamics and regional socio-economic status) to better understand the societal and technological challenges faced by the next generation of Moroccan professionals.

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