



Correlates of compulsive use of social media and academic performance decrement: A stress-strain-outcome approach

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ABSTRACT

Social media users feel overwhelmed by the amount of information inundated by followers and friends they have on various platforms of social media. They devote a lot of time to maintaining these online connections. This causes social media fatigue and poses a serious risk to social media users' wellbeing and productivity. Students could become victims of compulsive social media usage, which could lead to a decline in their academic performance. With the help of the stress-strain-outcome framework, this study attempts to establish the indirect relationship between compulsive use of social media and academic performance decrement via social media fatigue. Further, this study examined the moderating role of self-control (SC) in the relationship between social media fatigue and its negative effect on academic outcomes, which has not been analyzed so far. The effect of moderated mediation was assessed using the PROCESS Macro. The findings of the study suggest the mediating role of social media fatigue between compulsive use of social media and academic performance decrement. Further, the moderating role of self-control was established between social media fatigue and academic performance decline. The originality of the study lies in associating social media fatigue with decrement in academic performance and showing how self-control is helpful in mitigating its effects. This analysis can be insightful for students and educators who tend to ignore the negative impact of students' over-reliance on social media on their academic performance. The findings suggest that social media overuse by students requires self-regulation and requires careful scrutiny by educators in creating appropriate solutions to lessen social media's detrimental influence on higher education. The research provides useful recommendations for self-control on social media usage behavior.

Keywords: social media fatigue; self-control; compulsive use of social media; academic performance decrement; stress-strain-outcome framework

1 Introduction

The term "social media" describes the use of applications and websites that facilitate communication, interaction, community-based

feedback, content sharing, and collaboration between users from diverse backgrounds and locations (Lutkevich, 2021). There has been an unprecedented surge in social media

proliferation and indiscriminate sharing of information that has clearly led to discerning drawbacks, such as mental exhaustion or "being worn out" after prolonged use, commonly known as "social media fatigue" (SMF) (Ou et al., 2023). SM users can feel overwhelmed by the unprecedented variety of social media platforms, the humongous quantity of information available, the number of followers and friends they have, and the amount of time required to maintain these online connections. SMF, or the challenge of keeping up with online content (Cherubini et al., 2010), poses a serious risk to social media users (Dhir et al., 2019), as it may negatively impact a person's mental health like anxiety, depression (Dhir et al., 2018), productivity at school or at work (Malik et al., 2020), and both their academic and professional performance. This makes it crucial for students, educators and parents to comprehend the value created versus the risks associated with its excessive use. It is no surprise that SMF has garnered considerable interest from researchers in a variety of domains (Cao and Sun, 2018).

Although popular across all age groups, social media (SM) has gained an incomparable presence among higher education student populations due to the advantages of faster connectivity, learning, and entertainment it provides (Azizi et al., 2019). Depending on their interests, students utilize SM regularly, which eventually affects their lives in many ways. Though limited SM consumption may even be beneficial, its excessive use has a negative impact on students' wellbeing (Shiau, Dwivedi, and Lai, 2018) and academic progress (Dhir et al., 2019). This is particularly true for those who are in emerging adulthood between the ages of 18 and 29 and are dealing with uncertainty, and the exploration of various life choices, such as identity, relationships, education, career, and worldviews (Olenik-Shemesh et al., 2018). In comparison to others, college students are more prone to developing compulsive use of social media (CUSM) because of the availability of substantial spare time and flexible schedules in college (Turel and Qahri-Saremi, 2016) and its prolonged use may result in undue peer pressure and even loss of motivation (Sherman et al., 2016).

On the academic front, researchers claim that those who engage heavily in SM use are often

unable to avoid distractions in general since their brains become used to the outlook of SM content that constantly vies for one's attention (Fotuhi, 2020). High SM use influences cognitive abilities negatively (Lara and Bokoch, 2021) and causes the attention related regions in the brain to shrink (Fotuhi, 2020). Individuals begin to feel fatigued when their cognitive space reaches its threshold limit, which further causes a decrement in task performance. When activities or tasks are performed repeatedly, fatigue is common (Van der Linden and Eling, 2006), and although fatigued people can still execute their tasks, their attention span and performance quality steadily deteriorate (Boksem et al., 2005). The students may invest an enormous amount of time using it, as they are unaware of such negative impacts. As a result, such habitual behaviors tend to distract them from their academic work, affecting their academic performance (Junco, 2015). SM usage radically increases expectations for instantaneous responses, and this pressure to remain online may trigger social media fatigue (Liu and He, 2021). Thus, SMF generally emerges from experiencing an overload with regards to information, technology and communication that takes place through interaction on various online platforms (Dhir et al., 2018).

Prior studies have revolved around the discontinuation of use of the SM platforms after experiencing SMF. Recent research looked into SMF in association with multiple stressors like the fear of missing out (fomo), depression (Whelan et al., 2020a; Hattingh et al., 2022) and boredom. However, another study by Dhir et al (2018) noted that there are currently fewer studies about the linkage between excessive social media usage and its effect on academic behavior. Incorporating the Stressor Strain Outcome (SSO) framework, the study advances the future research direction set forth by Dhir et al. (2018) by examining some of the causes and effects of SMF.

The study investigates the role of SMF in a mediating context that has been rarely examined in the past studies (Malik et al., 2020), necessitating deeper research into various facets of SMF. There is a dearth of studies on the antecedents of SMF and coping mechanisms to alleviate its impact on academic performance (Homaid et al., 2022). This study attempts to close the gap by

evaluating the association between SMF and its related factors, such as compulsive use of social media and academic performance. In the current research, role of social media self-control (SC) as a moderator between the relationship between SMF and academic outcomes was also scrutinized. Świątek et al., (2023) indicated that social media users can establish the habit of refraining from overusing SM platforms through self-regulation. This study tries to fill a significant research gap by including SC in the model that has not been studied earlier and is a major factor in minimizing the role of SMF on academic performance decrement.

The study makes use of data collected from a sample of Indian college students, as Indians have witnessed a sharp rise in social media penetration (Yuki, 2022). Indians use social media for 2.36 hours per day on average. India's 467 million SM users have been growing steadily since 2023 due to the country's broad internet connectivity (The Global Statistics, 2023). Secondly, there hasn't been a lot of research done on how Indian college students utilize social media (Malik et al., 2020). This will advance the knowledge of SM users, which has so far concentrated on those from the developed economies. Additionally, the cultural diversity lens offers a new vision on the usage behaviors and related risks for SM users. The study is both timely and relevant, as the recent pandemic and dependence on pandemic induced online modes of education have further highlighted its significance among this age group (Khan et al., 2021). The study is of interest to parents, teachers, counsellors, policymakers, and students using social media, who should be aware of the detrimental consequences on academic achievement.

The study's findings can help young individuals gain a thorough understanding of how compulsive social media use may result in several impairments, including disturbed sleep, tiredness, exhaustion, and lower academic grades (Dhir et al., 2018; 2019; Malik et al., 2020). The results will also accelerate the ongoing debate on how individuals, especially students, must resist the unrestrained use of SM to safeguard themselves against its adverse consequences. The results call for greater vigilance by the academic community on this aspect of social media overuse Based

on continuous assessment of self-control strategies in diverse settings, there could be implications for pre-service and in-service educators' training as well as student training programmes. It can help content producers and pertinent stakeholders by giving them directions for designing content that is relevant and consumed by customers, leading to their retention. The outcomes of the study will also provide empirical evidence for the validity and applicability of the SSO model in explaining CUSM in the educational environment.

2 Theoretical Background

The stressor-strain-outcome (SSO) model, developed by Koeske et al. (1993), is used in the study, to determine the impact of various stressors on individuals' further resulting in negative outcomes. This prominent SSO framework is comprised of three components, namely stressors, strains, and outcomes. The stressor refers to all the emotional stimulators that include those negative influences, including technological overload (Lee et al., 2016a), compulsive use of SM (Homaid et al. 2022) and technostress (Dhir et al., 2018). Stressed individuals frequently experience psychological strain, which is essentially an emotional reaction to stress, e.g., anxiety, depression or fatigue (Zheng and Ling, 2021). This eventually results in a negative influence on the productive functions or individual's performance (Teng et al., 2022). The SSO framework aligns well with the main objective of the study, i.e., to evaluate the role of a stressor such as compulsive usage of social media in inducing fatigue (strain) and its ill-effects on the performance of the students.

2.1 Compulsive use of Social Media

Prior researches have revealed the importance of technology and internet in analyzing the changing dynamics of communications (Amin and Khan, 2021). It has become an integral part of our lives, especially the youth who are the largest consumers of social media content (Kemp, 2017). Xiao et al. (2022) observed that rapid growth in communication and technologies have led to intense use of social media, which generates stress, particularly when its consumption exceeds limits (Van der Schuur et al., 2018). Long-term exposure and prolonged usage of SM and subsequently decreased face-to-face social interactions result in various psychological issues and concerns

(Pang, 2021) and hamper daily functioning and productivity of individuals (Zivnuska et al., 2019).

2.2 Academic Performance Decrement

With technological advancement, individuals have started to consume massive amounts of information and communication from social media on a daily basis, leading to a deterioration of their performance as they start spending more time on SM at the cost of time and attention needed elsewhere (Zivnuska et al., 2019). Moreover, when individuals experience fatigue, their attention span deteriorates and the overall efficiency of their task performances decreases (Lorist, 2008). Academic performance decrement (APD) is the measurement of the adverse effect of SM use on the students' academic performance (Malik et al., 2020). Earlier researches (Whelan et al., 2020a; Yu et al., 2019) have revealed that excessive engagement in SM generally leads to SMF that later diminishes the academic performance.

3 Hypotheses Development and Research Model

3.1 Academic performance decrement and Compulsive use of Social Media

Intensive psychological and cognitive efforts are required in carrying out any physical or mental task, but individuals just have a limited cognitive capacity to perform different tasks and activities (Cao et al., 2018). Therefore, using SM platforms excessively within and outside of the classrooms negatively affect the availability of time required for studying and concentrating on other productive work, which further reflects on the overall academic performance (Yu et al., 2019). Arguably, the relationship between all CUSM and academic performance has remained somewhat inconclusive. For instance, some studies have shown that use of mobile phones for academic purposes has actually been found to improve academic performance among university students (Qi, 2019). A meta-analytical study revealed that social media usage was particularly effective where language test scores were concerned (Liu et al., 2017). Nevertheless, students who use social media excessively have shown to have psychological and behavioral issues that affect their ability to perform well in academics (Whelan et al., 2020a). While there exists a connection between CUSM and

academic performance, further research is required to gain a deeper understanding of this relationship with particular emphasis on Indian students. The SSO model has been utilized to empirically investigate the linkage of CUSM as a stressor and subsequent decline in academic performance as an outcome. The current study utilizes the concept of academic performance decrement (Malik et al., 2020) to measure the undesirable effect of SM use on the students' academic performance. Thus, we propose.

H₁: Compulsive use of social media is directly associated with academic performance decrement

3.2 Social Media Fatigue and Compulsive use of Social Media

Technological advancement has enabled users to engage with SM anytime, anywhere (Whelan et al., 2020b). In fact, most popular social media sites encourage compulsive and habitual use of social media (Turel and Qahri-Saremi, 2016) leading to an overwhelming amount of content and information overload. The cognitive effort spent in keeping up with the constant social media usage depletes energy levels, leading to SMF (Ravindran et al., 2014). Furthermore, Zhang et al. (2021) confirmed that the complexity, quantity of information, misinformation, disinformation and mal-information might altogether enhance the potential exhaustion and negative emotions, thereby causing SMF. The SSO framework has been applied to explain that the CUSM acts as a stressor leading to SMF, which acts as the psychological strain resulting in negative outcomes such as academic performance decrement as being examined in the current study.

H₂: Compulsive use of social media is directly associated with social media fatigue

3.3 Academic performance decrement and Social Media Fatigue

Prior studies have suggested that SMF has various detrimental outcomes (Malik et al., 2020). The state of fatigue induced by excessive use of SM has displayed damaging effect on the academic performance, mental and emotional health and psychological wellbeing (Dhir et al., 2018; 2019). Too much time spent on SM platforms limits the time required for studying and concentration. Furthermore, uncontrolled mental fixation with the social media during academic activities will lead to undue psychological

pressure that will culminate in lower performance (Yu et al., 2019). The SSO framework explains psychological strain serves as a mediator between the stressor and the outcome. Similarly, in our study, it is proposed that social media fatigue performs the role of strain in explaining the resultant decrease in academic performance (outcome) among the students.

H₃: Social media fatigue is directly associated with academic performance decrement

3.4 Social Media Fatigue as a mediator

Social media has been instrumental in providing novel ways of communication across spatial and temporal boundaries (Whelan et al., 2020b). Owing to the presence of multiple SM platforms, people have started to consume more time on these platforms than before (Zheng and Ling, 2021). Nevertheless, excessive use of social media might result in individuals getting tired of SM activities, which is termed as social media fatigue (Ravindran et al., 2014). Most users feel overwhelmed with the excessive information that is available online (Islam et al., 2020), as they have limited time and resources to process such information, thereby experiencing a subjective feeling of fatigue (Lee et al., 2016b). Prior researchers argued that compulsive SM usage results in emotional fatigue, which later leads to deteriorated academic performances (Shi et al., 2020; Dhir et al., 2018). Scholars have observed that SMF is closely linked with multiple detrimental emotional and psychological outcomes for the users (Pang, 2021). In our study, using the SSO model as the theoretical base for the empirical investigation, SMF is hypothesized as a mediator between the stressor as represented by CUSM and academic performance decrement as the outcome. Therefore, we propose:

H₄: Social media fatigue mediates the relationship between compulsive use of social media and academic performance decrement

3.5 Self-Control as a moderator

The current study has included self-control (SC) as a moderator as it is considered to be one of an inherent personality characteristic; that facilitates both the inhibition of non-desirable and promotion of desirable behaviors in individuals (Halfman and Rieger, 2019). The temptation or urge to use social media is irresistible for certain individuals as

they unconsciously engage in gaining pleasure derived from its prolonged use (Du et al., 2018). Most prior researches show that the physical, emotional and mental fatigue resulting from CUSM depends upon individuals' specific characteristics to self-control usage of social media (Alfasi, 2022). Bhargava and Velasquez (2021) observed that the inability to control oneself is one of the major reasons of inducing addictions among people. Only through self-control, SM users can form the habit of abstaining from unrestrained and addictive use of social media (Świątek et al., 2023); which is shown to exhibit several negative consequences such as loss of productivity and performance (Dhir et al., 2018). To the best of our knowledge, the role of SC as a moderator has not been studied in literature. It would be interesting to assess if SC inhibits the impact of SMF on academic performance decrement as it may provide some solutions to deal with high levels of SMF due to excessive social media activities.

H_{5a}: Self-control will moderate the relationship between academic performance decrement and social media fatigue.

H_{5b}: The indirect effect of compulsive use of social media on academic performance decrement via social media fatigue is conditional on self-control. The indirect effect is weaker for students who report high levels of self-control.

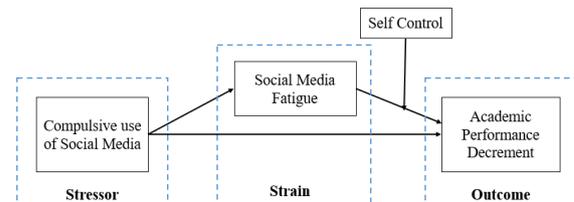


Figure 1: Conceptual Framework

4 Research Methodology

4.1 Data Collection

Primary data was collected from post-graduate students studying at various public and private institutes in Delhi and its National Capital Region of India. A recent study found that the extent to which postgraduate students use social media is not well-documented in the literature (Le Busque and Mingoia, 2023). Furthermore, Mahajan et al. (2022) demonstrated the significant role of academic performance and domain knowledge for employability of postgraduate students. Owing to a better chance of securing placement and achieving economic and

professional success, the study concentrated on postgraduate students studying at various public and private institutes in Delhi and NCR.

In this study, purposive sampling was used to ensure that data is collected only from those students who spent considerable time on SM. To ensure this, a filtering question was included in the questionnaire, which helped us to include only those respondents who spend at least four hours a day on social media. For data collection, we took help from our fellow professors teaching in various private and public institutions. About 650 students were contacted to fill out the survey and 540 of them confirmed to do so. Following recommendations by Podsakoff et al. (2003), the data for the study was collected in two different phases in order to avoid the effects of common method bias. During the initial phase, the data was collected on students' demographic information and compulsive use of social media and self-control. Out of the 540 students who agreed to participate, 503 actually participated. In the next phase, the data was collected for the response variable (academic performance decrement) and mediating variable (social media fatigue). At this point, 27 students dropped from the group, leaving 476 students. Each questionnaire was given a label with a code that matches the answers from both stages. Further, 42 more responses were discarded due to missing data or outliers. In the end, 434 total responses were used for data analysis.

4.2 Measures

Each construct of the study was measured on a five-point Likert scale as it can help survey administrators to increase response rate and response quality (Buttle,1996), and is easier for the respondents to understand (Marton-Williams, 1986).

To gauge compulsive use of social media, 4 items scale was adapted from Andreassen et al. (2012) and validated by Tandon et al. (2021) and Jabeen et al. (2023). The sample statements used to measure compulsive use of social media were "Spend a lot of time thinking about social media or planned use of social media" and "Feel urge to use social media more and more".

For measuring academic performance decrement, we used five items scale developed by Kubey et al. (2001) which was extensively used in the literature and validated in many recent studies (Malik et al., 2020; Homaid, 2022). This scale is used to figure out the decrement in the student's academic performance due to their excessive involvement in social media. The sample statements used to measure academic performance decrement were "My assignments have been hurt because of the time spent on social media" and "I sleep late because of using social media".

Further, items for social media fatigue were adapted from (Whelan et al., 2020b) consisted of five items relating to the fatigue caused owing to the continuous social media usage. The sample items measuring social media fatigue include the statements like "I find it difficult to relax after continually using social media" and "After a session of using social media, I feel really fatigued". Lastly, to measure self-control, we adapted the scale on deficient self-regulation developed by Whelan et al. (2020a). It measures the understanding of a student to self-control the use of social media. This scale is formed of five statements that help in measuring how much a student believes that he/she can restrict themselves from using social media. Sample statements include "I am good at keeping the social media use under control" and "I feel that my social media usage is within control".

4.3 Preliminary Analysis

Table 1 displays the demographic details of respondents, whereas Table 2 exhibits the mean values, SD, Cronbach alpha values, AVE and CR for each construct. It is clear that each construct's reliability scores exceeded the suggested value of 0.70 (Nunnally, 1968). Table 3 reveals that the correlation coefficient between each pair of constructs is less than the square root of AVE, which confirms the discriminant validity as per the criteria given by Fornell and Larcker (1981). Also, table 3 presents the HTMT values which are all less than the threshold value of 0.90 (Henseler et al., 2015). Demographic variables were used as control variables in the model but were found to have no significant effect on the study variables.

Table 1: Demographic Details

Gender	Year of Programme	Academic Background	Academic Discipline
Males (239)	First (220)	Humanities (117)	Management (285)
Females (195)	Second (214)	Commerce (126)	Non-Management (149)
		Science (103)	
		Engineering (76)	
		Others (12)	
Source: Authors			

Table 2: Reliability

Constructs	No. of items	Factor loading Range	Cronbach Alpha	AVE	CR
1. Compulsive use of social media (CUSM)	4	0.706 - 0.854	0.823	0.744	0.808
2. Academic performance decrement (APD)	5	0.755 - 0.893	0.853	0.723	0.853
3. Social media fatigue (SMF)	5	0.722 - 0.871	0.851	0.860	0.916
4. Self-control (SC)	5	0.741 - 0.927	0.889	0.824	0.942
Source: Authors					

Table 3: Discriminant Validity

Variables	1	2	3	4	5	6	7	8
1. Gender	1							
2. Year of Programme	0.003	1						
3. Academic Background	-0.003	0.003	1					
4. Academic Discipline	-0.015	-0.007	0.002	1				
5. Compulsive use of social media (CUSM)	-0.009	0.006	0.036	0.014	0.863			
6. Academic performance decrement (APD)	0.017	0.014	0.014	0.126	0.283 (0.489)	0.850		
7. Social media fatigue (SMF)	-0.023	-0.005	0.007	0.024	0.437 (0.502)	0.309 (0.326)	0.927	
8. Self-control (SC)	0.018	0.008	0.002	0.012	0.232 (0.449)	-0.321 (0.422)	0.351 (0.351)	0.907
Note: N = 434; bold diagonal values represent square root of AVE; bracket values denote HTMT ratios								
Source: Authors								

Direct Effects

The first hypothesis that compulsive use of social media is directly associated with academic performance decrement is supported by the results (beta = 0.113, p = 0.000). A positive and significant relationship between compulsive use of social media and social media fatigue (beta = 0.422, p = 0.000), lending credence to the second hypothesis. Additionally, a positive association among social media fatigue and academic performance decrement was found, which supports the H3 of the study (beta = 0.189, p = 0.000). The results obtained are statistically significant as zero does not fall within the lower and upper levels of confidence interval i.e. LLCI and ULCI.

4.4 Mediation Results

To test mediation, path analysis was done using SPSS PROCESS as suggested by Hayes (2013). We tested the mediation relationship using Hayes model 4. It was found that compulsive use of social media was linked to academic performance decrement indirectly through social media fatigue ($\beta = 0.108$, standard error = 0.0238, LCI = 0.0421, and UCI = 0.1311). These results support the fourth hypothesis, which says social media fatigue has an important role in the association between compulsive use of social media and academic performance decrement. The direct and significant associations between dependent and independent variables hint at the existence of mediation. Also, the variance

accounted for was found to be 63 percent, which suggests that social media fatigue partially mediates the relationship between compulsive use of social media and academic performance decrement Hair et al. (2011).

control is responsible for 7.8% of the change in the relationship between SMF and APD. Self-control has been examined at different levels (high and low) as -1 SD and +1 SD from the mean value to satisfy the third criteria. Table 6 exhibits that the auxiliary effect of

Table 4: Mediation effect

CUSM on SMF		SMF on APD		Direct effect of CUSM on APD in presence of SMF		Total effect of CUSM on APD		Bootstrap results for indirect effect	
Beta	t-value	Beta	t-value	Beta	t-value	Beta	t-value	LLCI (95%)	ULCI (95%)
0.416**	9.318	0.199**	8.305	0.108**	6.281	0.147**	6.524	0.042	0.231

Note: **p < 0.01
Source: Authors

4.5 Moderated Mediation

The effect of moderated mediation was studied using Hayes (2013) Model 14 of PROCESS Macro. The indirect impact of compulsive use of social media on academic performance decrement through a social media fatigue should vary depending on how much self-control is felt in order to satisfy the criterion of moderated mediation. Hernandez et al. (2016) said there are 3 conditions that need to satisfy for moderated mediation to work. The indirect effect must be significant as the first requirement. The independent variable should have different conditional indirect effects on the criterion variable via mediator at high and low levels of the moderator, and the interaction term between the mediator and the moderator has to be a significant in predicting the response variable. The indirect effect is significant, as evidenced by the results shown in Table 4. This fulfills the first condition. Hierarchical regression analysis was used to test how self-control changed the relationship between compulsive use of social media and academic performance decrement (Aiken et al., 1991). Table 5 shows that interaction between social media fatigue and self-control is important in envisaging academic performance decrement ($\beta = 0.691$, $p = 0.000$), that means that a direct relationship between SMF and APD is feebler when students have low self-control. The result fulfils the second condition of moderated mediation. H5a says that self-control will improve the relationship between social media fatigue and academic performance decrement. The R square change of 0.78 means that self-

compulsive use of social media on academic performance decrement through social media fatigue was strongest at the higher level of self-control (1 SD; indirect effect = 0.271) and weaker at the lower level (1 SD; indirect effect = 0.210). The results from Table 5 prove the study's hypothesis (5b), which says that CUSM has an indirect effect on APD through SMF, but this effect depends on how much self-control is present. When compared to students who perceive lower levels of self-control, the indirect effect is reduced for those who perceive high self-control.

Table 5: Moderating effect of self-control in social media fatigue-academic performance decrement relationship

Independent Variable	Dependent Variable Beta
Variables and Steps	
<i>Step 1: Control variables</i>	
Gender	-0.031
Year of Programme	0.052
Academic Background	0.077
Academic Discipline	-0.036
<i>Step 2: Direct effects of independent variables</i>	
SMF	0.562**
SC	0.292**
<i>Step 3: Interaction effect</i>	
SMF * SC	0.691**
R ²	0.352
R ² change	0.078
F-value	36.382**

Note: n =434, **p < 0.01
Source: Authors

Table 6: Moderated-Mediation Results

Bootstrap Values	Indirect effect	Standard error	Lower confidence interval	Upper confidence interval
Mentoring Support				
1 SD below	0.271	0.033	0.235	0.346
M	0.224	0.021	0.182	0.299
1 SD above	0.210	0.022	0.174	0.282

Note: Bootstrap sub-samples = 5000; degree of confidence = 95%; criterion Variable: Academic performance decrement; Predictor variable: Compulsive use of social media; Mediator: Social media fatigue; Moderator: Self-control
Source: Authors

5 Discussions

Based on its objectives, the study sought to apply the SSO framework to examine how compulsive social media usage leads to SMF, which results in a decline in students' academic outcomes. The findings demonstrated that students' declining academic performance was directly affected by social media fatigue and compulsive use of social media. The findings of our study are in line with past research (Cao et al., 2018), which found that factors causing fatigue can be directly linked to an individual, such as their propensity for compulsive use. The study is especially pertinent post-pandemic since SM has now become an integral part of digital life and the screen time of individuals has increased considerably (Misra et al., 2023). While usage of social media (SM) during COVID-19 was initially a medium to provide social support that helps people feel less exhausted (Ngien and Jiang, 2021), its prolonged use is debated as a stressor.

The study also assessed if the influence of social media self-control can act as a moderator in these relationships. The statistical findings demonstrated that the association between CUSM and academic achievement was moderated by social media self-control. The moderated impact of self-controlled SM use on fatigue and reduced academic performance offers fresh insights for SM users to devise strategies to moderate the

amount of time they spend on social media platforms.

The analysis of H1 offers a deep understanding of the problems arising out of social media usage by clearly identifying the association of decrement in academic performance due to CUSM. Students can access a plethora of information on various SM applications, including news articles, frequent notifications and alerts, but its overuse negatively impacts their critical ability and thus, their academic performance by rendering their brains unable to fulfill higher order thinking activities. Applying the SSO framework, it can be affirmed that CUSM acts as a stressor leading to technology-induced stress due to its excessive usage that results in negative consequences like disturbed study and sleep and ultimately a decline in academic performance. Earlier studies (Malik et al., 2020; Dhir et al., 2019) too reported similar findings, wherein continuous behavioral and psychological strains led to fall in academic grades among young school students. However, the literature on the effects of CUSM on academic achievement had a few contradictory findings. For instance, a study among secondary school students reported no association between compulsive social media use and poorer academic performance. (Wartberg et al., 2020). Similarly, another study by Qi, (2019) reported that university students perform better academically when they use mobile devices.

The second hypothesis, H2 was supported by our research findings. It was found that due to a continuous inflow of messages and notifications, social demands and recurrent interactions, students faced an overload of information that caused higher stress levels, leading to social media fatigue (Shi et al., 2020). Interestingly, Ngien and Jiang's study (2021) revealed that social media in fact did not cause greater stress during the pandemic. Moreover, Salo et al. (2019) claimed that 'like' or 'mention' notifications gave incentives and made social media users, particularly students, happy. This means that while deliberate and controlled usage of SM inspires improved learning experiences, excessive usage by university students leads to getting tired of overwhelming content, resulting in SMF. Understandably, the SSO framework helps in explaining how the indiscriminate use

of SM results in technostress (Shi et al., 2020) that causes excessive mental and psychological strain in the form of social media fatigue (Lin et al., 2021).

Our findings supported the third hypothesis that investigated SMF among young adults and its direct influence on academic performance decrement. The findings suggest that when the students are overloaded with excessive information on social media, students suffer psychological strain and are likely to achieve poor academic grades. The results are in consonance with prior studies (Shi et al., 2020; Cao et al., 2018) that found social media fatigue to be a significant source of decremented academic performance. Extending the postulates of the SSO framework to explain the phenomena, it can be inferred that when students indulge in social media overuse, they are inundated with information overload that acts as a potential stressor, thereby leading to negative outcomes in the form of low academic achievements. Inevitably, social media use distracts the student's concentration, thereby giving rise to a lack of focus and increased difficulties in grasping crucial knowledge necessary for good academic performance.

The results of hypothesis H4 demonstrate that the SMF mediates the effect of CUSM on the decline in academic performance. The study supports earlier research that claims that excessive SM use lowers academic performance because it produces extreme fatigue (Dhir et al., 2018; Shi et al., 2020). Research has shown that spending excessive time on SM platforms occupy the mind-space and induce considerable stress or fatigue that is bound to affect human performance and output (Malik et al., 2020; Cao et al., 2018). Inevitably, mental preoccupation with the SM inhibits students' concentration and focus on studies, which ultimately culminates in lower academic grades. Basing our arguments on the SSO theoretical framework, it can be interpreted that CUSM affects the cognitive attributes of the students by acting as stressors. This further triggers mental fatigue, which can be construed as the psychological strain that ultimately affects the students' academic outcomes adversely.

The confirmation of hypothesis H5 reveals that self-controlled usage of SM acted as a

moderating variable between deteriorated academic performance and SMF. The study corroborated that high levels of self-control cause less disturbance to one's mental concentration. This further leads to overriding the resultant SMF to a significant extent, due to which the negative effect of SM on behavioral choices is reduced. High control makes people less disturbed and they can overcome fatigue to some extent, which also lessens the overall impact of preoccupying thoughts and behavioral decisions. The SSO model successfully integrates the role of CUSM as a stressor that induces strain in the form of social media fatigue, ultimately resulting in impaired academic performance. Moreover, the results established that all the adverse outcomes can be somewhat mitigated by the presence of self-controlled behavior of the students towards problematic use of social media. Thus, it can be concluded that the negative consequences of harmful exposure of social media on the students' academic performance can be well managed with the students' self-control to limit its usage.

6 Theoretical and Practical Implications

This study provides several implications for researchers, social media users, policy makers, educationists and parents. To begin with, it contributes to the existing knowledge on the potential antecedents as well as the consequents of SMF by focusing on young adult users and utilizing lesser-known measures. The SSO framework was empirically validated for its linkage between the compulsive use of social media (the stressor) and the decrement in academic performance (as its outcome), with social media fatigue (the strain) acting as a mediator among Indian college students. This model extends the existing literature on SSO theory, as the indirect role of social media self-control in inhibiting the adverse impact of excessive use of social media on academic performance has not been previously studied.

The current study is also helpful in understanding the significant role of self-control as a moderating variable in repressing the harmful effects of SMF on the students' academic performance. The study is likely to motivate SM users to understand the negative consequences of SMF, especially in terms of academic performance, which is of paramount importance for any student. The study is also

effective in highlighting the negative effects of addictive use of SM, which is especially significant in the context of growing smartphone ownership in developing countries like India (Dhir et al., 2018). The negative implications will add to the existing discussion about compulsive social media use in emerging economies, allowing for the timely introduction of corrective measures. Social media use that is excessive can have a profound negative effect on students' lives. Students will benefit from this study by becoming more aware of the adverse effects of excessive social media use and learning how to utilize it judiciously. This highlights the need to resist their tendencies towards excessive use by imposing self-imposed moderation. The findings can be used to inform students about the drawbacks of uncontrollable use of social media and give them strategies for good social media management.

Managing social media usage effectively involves implementing self-control strategies to minimize its negative effects while harnessing its benefits. It also calls for more discussion on identifying the best self-control strategies and devising ways to integrate them optimally in students' lives so that they can regulate their academic load. One strategy is to set clear goals and limits for social media use. By defining specific objectives and allocating dedicated time for social media engagement, individuals can regulate their behavior effectively (Verduyn et al., 2017). Rather than resisting short-term temptations, these long-term healthy self-regulation abilities or behaviours can help these young adults lead balanced lives to advance their academic goals.

Social media is responsible for exposing young adults to unrealistic views of other people's lives, misinformation, opinionated influencers, and vain comparisons (Beal, 2022). Due to the inflated expectations that result from excessive social media use, fatigued SM users are susceptible to a decline in their ability to listen to others and communicate face-to-face (Kolhar et al., 2021). In such a situation, self-control techniques are found to be more important than entirely quitting social media. It is important to reflect on how social media affects emotions, self-esteem, and overall well-being. By identifying triggers and negative

patterns, individuals can make informed decisions about their social media use (Hawi and Samaha, 2017). In light of previous research that indicates that receiving frequent notifications can lead to higher levels of distraction and addictive behaviors (Rosen et al., 2013), controlling notifications can be helpful in reducing distractions and the constant urge to check social media platforms. Furthermore, taking regular breaks from social media, often referred to as 'digital detox', is another self-control strategy that is gaining traction these days. Studies have shown that disconnecting from social media can ultimately reduce feelings of loneliness and depression (Hunt et al., 2018). Hence, self-control strategies can include reminders for engaging in offline activities, which helps maintain a healthy balance and cultivate self-control behaviour.

Developing critical thinking skills is crucial to navigate the vast amount of information on social media. Being discerning and evaluating the reliability and accuracy of shared content can help individuals avoid falling prey to misinformation and fake news (Pennycook and Rand, 2019) and benefit their learning journey. Mindful curation of social media feeds is important to create a positive online environment and enhance the benefits of social connection (Escobar-Viera et al., 2018). It involves following accounts and communities that align with one's interests and values. Using social media as a tool to foster real-world connections is another effective approach. Research suggests that social media can supplement offline interactions and help maintain genuine relationships (de Zúñiga et al., 2017). Lastly, monitoring and being mindful of one's emotional state while using social media is essential and help in promoting psychological well-being. Practicing self-care and avoiding excessive comparison with others can contribute to a healthier social media experience (Lee and Lee, 2017). These self-control strategies can effectively help individuals manage their social media usage to minimize negative effects while maximizing the benefits it offers.

Besides, the research tries to assist various stakeholders in examining their role in social media use so as to maximize the benefits while simultaneously minimizing the drawbacks. This is done by utilizing social media to

positively impact physical, academic, and social performance. Additionally, the results of the study provide higher education stakeholders with important insights. These insights are helpful while creating, developing, implementing, and assessing cutting-edge learning environments that utilize social media without indulging in immersion-enhancing features. This presents important implications for content designers, who must balance the fine line between engaging users and simultaneously giving each user power over the actions they take and how they decide to take them at all times.

7 Limitations and future research

There are certain limitations to the current empirical study. Though all theoretical antecedents and consequences of SMF need to be identified and analyzed, it has proven to be a difficult task, especially with the current lack of perception on the same. SMF has negative influences and impacts on a range of variables.

The outcomes of such influences like academic-related stress and dissatisfaction require a deeper analysis. Future research models can also include a range of moderators, such as different social media platforms, as different types of platforms may have different bearings on their use. The sample used in the study focuses only on Indian college students; hence, future research should be undertaken using samples from other countries with similar cultural and economic factors. Besides, this model can be replicated in other parts of India to see its applicability in tier 2 and tier 3 cities where SM penetration may not be as higher as Delhi-NCR. Despite being a widely used framework, the SSO model's capacity to take into account variations in cultural nuances and personality traits is constrained. In order for students to manage their academic load, further discussion of the best possible self-control techniques and ways to optimally incorporate them into daily life is needed. Future work can incorporate more causes as potential stressors leading to SMF and APD. Researchers may use experimental and longitudinal methods to look at the causes and effects of social media fatigue.

Declaration of interest: none

Acknowledgment: None

Funding sources: Not Applicable

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