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Behavior and Emotive Predictors of Cognitive Flexibility: The Influence of Bedtime Procrastination and Fear of Missing-out

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ABSTRACT
The present study examined bedtime procrastination and fear of missing out as predictor of cognitive flexibility in young adults. Bedtime procrastination has become increasingly common due to poor self-regulation and excessive social media use, and FoMO is largely driven by social connectivity pressure and tis is linked with emotional distress and disrupted sleep pattern. Quantitative correlational research design was employed, data was collected from 200 people involving young adults aged 18-24, who completed the questionnaire. Scales used for this purpose are all standardized. Measure include Bedtime Procrastination scale, Fear of Missing Out scale, and Cognitive Flexibility scale. SPSS version 24, descriptive statistics, Pearson correlation, regression analysis were employed for data analysis. The findings showed that there was significant relationship between bedtime procrastination and cognitive flexibility, whereas fear of missing out had significant negative correlation with cognitive flexibility. Furthermore, regression analysis shows predictive relationship of bedtime procrastination and fear of missing out on cognitive flexibility, higher bedtime procrastination leads to increase in cognitive flexibility whereas higher fear of missing out decrease cognitive flexibility.

Keywords: *Bedtime Procrastination, Fear of Missing Out, Cognitive Flexibility.*

Introduction

Young adults

Young adulthood characterized by a crucial phase of development and change that is considered as significant changes, examination, and formation of person identity. During this phase of life, an individual goes through the complexities, difficulties, exploring new things and understanding experiences, tasks and trials, and ambitions becomes important for promoting and enhancing well-being and prosperous. This period of life typically starts from late adolescence to the mid-20s, comprises a multitude of changes, including educational quests, career development decisions, and formation of independence. During this phase of life, individuals facing and undergo social, emotional, and cognitive development, as person circumnavigate involving interpersonal relations, identity formation, and chase personal goals. By considering and understanding the unique opportunities and difficulties that are faced by young adults is fundamental for enlightened research, policy, and interventions

intended to support growth, resilience, and fulfillment during this difficult period of life (Arnett, 2000).

Here, the current study focus on the psychological construct of cognitive flexibility and as if there was any role of bedtime procrastination and fear of missing out in influencing it.

Bedtime Procrastination

The concept of bedtime procrastination was introduced by Kroese & colleagues (2014) defined as the intentionally delaying going to bed, even when there is no external reason for doing this. According to Sirois, (2015) it involves intentionally delaying going to bed, engaging in activities that are not necessary and which leads to less sleep hours. Bedtime procrastination is failure in self-regulation and voluntarily delaying to go to bed in the absence of any logical reason (Hill et. al., 2022).

Increasing Prevalence of Bedtime Procrastination among Young Adults

Bedtime procrastination has widely emerged behavioral phenomenon among young adults, especially with increasing use of mobile phone and internet use before sleep. Research proves that a significant proportion of people delay going to bed despite having intention to sleep., and this is because of poor self-regulation, it might be stress or excessive involvement in online activities. In a sample of 495 university students, 17.14% students had high bedtime procrastination (Alshammari et. al., 2023).

Procrastination is a problematic phenomenon, which refers the intentionally delaying of an intended course of action despite knowing the worse consequences of delay. Procrastination is a psychological trait that reflects a lack of self-control and is a clearly associated with impulsivity, low self-control, and consciousness. Bedtime procrastination is defined as staying p later than planned when no outside factors are blame. According to Kroese (2014), bedtime procrastination is a phenomenon where individuals delay or putt off going to bed, even though they have the intention to go to sleep, leading to insufficient or disrupted sleep patterns. This behavior typically involved engaging in non-essential activities such as watching TV, browsing the internet, or using social media, despite being aware of the negative consequences on sleep duration and quality (Kroese et. al 2014).

In spite of the fact that sleep is usually considered as pleasant and is known to be vital for physical and psychological health like well-being, many people continue to get insufficient sleep on a regular basis. Recent researches suggested that in general population individual who do not have sleep disorders or irregular work schedules, this lack of sleep often results from choosing short-term pleasures over going to bed on time and sacrifice their sleep in favor of short-term rewards. This behavior pattern is known as bedtime procrastination, which refers to failure in self- regulation which involves unnecessarily and willingly delay going to bed, even they know the negative consequences of staying up late. It is important to note that not all delays constitute as procrastination, only those delay which causes discomfort is considered as procrastination. Individuals who procrastinate at bedtime typically involves expecting discomfort often includes anticipating tiredness, irritability, and guilt the following day (Nauts et al., 2019).

Theoretical Framework

1.Self-Regulation Failure Theory

Self-regulation failure theory was developed by Kroese and applied on the concept of bedtime procrastination. According to self-regulation failure, sleep delaying occur when person is unable to make their action match with their intentions. Self-regulation involves setting and planning goals, monitoring one's own actions and behaviors, and adjusting actions as needed. Bedtime procrastination emerge when individuals plan to sleep on time but instead going to bed engaging in unnecessary activities like watching TV or using social media networking sites. This inability to monitor and prioritize their behavior which further leads to negative consequences like reduced sleep and fatigue (Kroese et. al 2014).

2. Self-Control Theory

Self-Control theory also applied by Kroese which suggests that bedtime procrastination may results from difficulty in resisting immediate temptations. People who possess strong self-control can avoid stimulating nighttime activities and maintain consistent sleep habits. On the other hand, those with lower and weak self-control tend to choose short-term pleasures like scrolling through their smartphones and watching entertainment on various networking sites over the long-term benefits of adequate rest (Kroese et. al 2014).

Causes/Factors influencing Bedtime Procrastination

Previous literature showed that procrastination has a meaningful relationship with personality traits. Individuals who possess extraversion personality characteristics exhibited higher levels of bedtime procrastination. Extroverted individuals tend to be energetic, socially active enthusiastic, and inclined toward stimulation and social interaction. Because of these tendencies, extraverted people spend more time engaging with others or participating in social activities, which increases the likelihood of delaying their bedtime (Chen et. al., 2022).

Self-regulatory fatigue also causes bedtime procrastination among junior college nursing students. Self-regulatory fatigue emerges, which reduces an individual's ability to maintain effective self-control (Chen et. al., 2022).

Problematic mobile phone is linked with and leads to bedtime procrastination. Research says that smartphone is deeply integrated into daily life, serving purposes such as work, study, communication, payments, shopping, and health management. Alongside these essential functions, they also provide easy access to entertainment, including games and videos. Excessive nighttime phone use can cause students to become absorbed in these activities, preventing them from going to bed s planned and resulting in bedtime procrastination (Chen et. al., 2022).

The other factor that influence the cognitive flexibility was fear of missing out.

Fear of Missing Out (FoMO)

FoMO refers to a sense of anxiety or concern that enjoyable or meaningful experiences may be occurring elsewhere without one's involvement. It reflects a persistent worry that others are engaging in rewarding activities, which leads to a strong urge to stay constantly updated on their lives. First FoMO was introduced by McGinnis in 2004, the concept emerged from

patterns observed on social networking platforms. FoMO involves two core component: initially, the belief or perception that one is being excluded from appealing experiences, and subsequently, the compulsive attempts to remain socially connected in order to avoid such feelings This social aspect of FOMO can be understood in terms of relatedness, emphasizing the innate human need to belong and form strong, stable interpersonal relationships (McGinnis, 2004 as cited in Przybylski et. al., 2013).

Few studies have considered FoMO as an antecedent to the negative consequences of social media use, such as social media fatigue, disruption in daily/routine activities, the intrusiveness of social media platforms like Facebook, and problematic sleep due to social media use. Previous researches suggested that FoMO is a key factor which motivate an individual's social media engagement. Therefore, the limited scholarly attention given to FoMO highlights a meaningful gap that further needs investigation. Furthermore, prior studies indicate that FoMO relationship with other's negative aspects of social media use may be influenced by additional factors, such as compulsive usage patterns and emotional states. (Tandon et al 2021).

Networking sites like TikTok, Snapchat, Instagram and Facebook all of these platform provide information along with social interaction. FoMO is a form of anxiety that roots from the possibility of not being participant in rewarding experience online, this leads people to feel overwhelmed to constantly monitor their online activities like social interaction through online networking sites. This social phenomenon is linked with need-to-need theory, which suggests that FoMO is driven by uncertainty about social belonging. The more the drive of belonging, the greater the chances of experiencing FoMO (Servidio, et al, 2024).

Fear of Missing out is a new term first mentioned in 2004 and extensively adopted from 2010 onward to explain behavior commonly observed on social networking sites. This term gained further recognition when this term added in Oxford Dictionary in 2013. In the same year, British psychologists defined FoMO as an ongoing concern that people are gaining and having enjoying experiencing without you. FoMO is characterized as the strong desire to remain constantly connected to other's activities. As a modern psychological phenomenon, FoMO can appear in several forms as a brief episode occurring during daily interaction, as an enduring personal tendency, or as a general state that leads to deeper sense of social inferiority, loneliness, or intense rage. FoMO operates through two processes. First, the perception that one is missing out on meaningful experiences, and secondly, followed up with a compulsive behavior to maintain these social interactions. This social component of FoMO is closely tied to the fundamental human need for relatedness which is the desire to belong and maintain stable interpersonal relationship. FoMO is problematic form of attachment to social media sites and other networking sites and linked with many negative outcomes, including disturb sleep pattern, functioning problems, emotional instability, anxiety and low physical well-being and failure in emotional regulation. Recent researches focus on identifying the most vulnerable population to FoMO and exploring the underlying factors that contribute and reinforce it (Oxford Dictionary, 2013 as cited in Gupta et. al., 2021).

Fear of missing out (FoMO) was first identified on the *Huffington Post* as a noticeable behavior. Since then, several early studies have attempted to understand how common FoMO is and how it connects to social media use. Research shows that 29% of young people continue checking their smartphones for updates, and 20% of them frequently check emails, messages, and social media every 10 minutes. The first scholarly paper on FoMO was published by Przybylski and colleagues in 2013. They conducted three studies to assess FoMO as a factor linking individual differences and social media use, and how to examine its emotional and behavioral consequences. Their definition of FoMO has since been widely used by researchers. Hato stated that definition of FoMO vary slightly, as people having FoMO tend to experience negative emotions when they appraise that they are not connected with others (Song et. al., 2017).

FoMO is cognitive psychology concept, which is related to the need of human to understand and be aware of what is happening around the person. A theory named self-determination which is originally proposed by Ryan and Colleagues (2019) and late applied by Przybylski provides useful explanation of exploring FoMO as it focuses on fundamental motivational needs like autonomy, be competent, and relativism and how all these influences levels of FoMO. According to SDT, social relatedness is important for intrinsic motivation and psychological well-being. According to Przybylski and his colleagues (2013) argued that these FoMO feeling arise when these needs for connection are not met, this eventually leads to negative emotional states. Previous studies mainly focused on personality traits, temperament, and individual differences, while paying less attention to external influences such as technology design, social norms, and environmental factors. It has been suggested that a socio-materiality perspective can broaden the understanding of FoMO. Another theory named socio-materiality stated that both people and technological tools interact and influence each other. Both individual and other devices like smartphones are evaluated when examining how FoMO develops (Song et. al., 2017).

A theory named Self-determination which is also a theory of human motivation provides a useful explanation for framing a theoretical bases of understanding of FoMO. Self-determination theory stated that good and effective self-regulation and psychological health are totally based on satisfaction of three main psychological need. These needs are competence which is referred to as the capacity of acting affectively in the world, autonomy which referred to as independence, self- governed, and self-management, and relatedness which is referred to as belongingness, social connectedness. Research provide information that basic need satisfaction is linked with proactive regulation of behavior. According to basic need satisfaction, low levels of satisfaction link with FoMO and social media engagement. This link could be direct and those who experiencing this are more prone to use social media. Because social media provide quick way to get connected with others (Przybylski et. al.,2013). FoMO affects individual's life negatively. FoMO causes psychological disorders like depression, increased anxiety symptoms, stress, failure in functioning well in once life, and increased risk of developing psychopathological and social media addiction. Side effects of

FoMO includes irregular sleep pattern, excessive eating, loss of focus, anxiety, and inability in keeping academic life well. People having FoMO will also experience difficulty in communication, stress, person feel rejected, isolated, lonely and also develops inferiority and insecurity about oneself (Tanhan et. al., 2022).

The above mentioned factors can directly affect the cognitive flexibility in young adults.

Cognitive flexibility

Cognitive flexibility involves an individual's mental readiness and motivation to change their behavior when needed. Even though people might be aware that there are multiple behavioral options exist, this awareness does not prohibit that they will act differently from their usual patterns. It suggested that person willingness to be flexible is one of the clearest indicators of how intrapersonal communication shapes the effectiveness of interpersonal communication. People with cognitive flexibility are open to experimenting with new communication strategies, confronting with unfamiliar situations, and adjusting their behavior to suit different contexts. Cognitively flexible person possess confidence in their ability to respond effectively. This idea is supported by Bandura's concept of self-efficacy. Bandura argued that individuals evaluate and integrate various types of information about their capabilities and regulate their actions and effort based on these evaluations (Martin & Anderson, 1998).

Cognitive flexibility refers to a person's capacity to modify their thinking in response to new or unforeseen situations in the surrounding. There are three are key features of cognitive flexibility. First, cognitive flexibility is considered an ability, which is suggested that it can improve through learning and practice. Secondly, cognitive flexibility requires adjusting cognitive strategies of oneself, which refers to organizing sequences of once mental processes that are used to solve various problems. Cognitive flexibility reflects shifting complex patterns of behavior rather than simple and easy actions. Third, cognitive flexibility emerges when a person changes their approach after already working on a task and facing unexpected changes in the environment (Canas et. al., 2006).

When person performs a difficult task, they must change their behavior according to environmental conditions in which they perform the task. These conditions continuously evolve as the task develops, so in order to be maintaining flexibility, person requires to ongoing attention to these changes. In order to work effectively, person must recognize and reorganizes their knowledge so that they perform their tasks effectively. This process is therefore based on attentional process. In cognitive flexibility, attentional processes play an important role. In recognizing that a situation has change and recognizing the need for unplanned response, it requires a heightened level of attention and focus. In order to be flexible, a person is able to notice environmental factors that hinder task performance (Canas et. al., 2006).

Cognitive flexibility is also shaped by how people structure and present their knowledge and other strategies that are needed to perform a task. Human behavior is guided by learned new knowledge about relevant environmental cues that are gathered by previous experiences. Although, when person experience new situation in life, this knowledge must be revised to

accommodate new task requirements. According to Cognitive Flexibility theory person who can view a task from different perspectives and dimension are better at interpreting environmental changes. Such people rapidly recognize their knowledge, allowing them to adjust their actions more effectively to changing circumstances (Canas et. al., 2006).

Fear of missing out negatively correlate with cognitive flexibility and this is also supported by previous research conducted with 328 adults in turkey. The pervasive use of social media has given rise to new psychological challenges, including the fear of missing out. Understanding how individuals cope with these challenges is therefore important. The results of this study support our results as this study revealed that there is weak, positive and significant relationship between FoMO and AAQ-II scores, indicating higher FoMO levels are associated with lower psychological flexibility. While the direct research on the relationship between FoMO and cognitive flexibility is limited, our research findings provide preliminary provide evidence that supports the link between FoMO and cognitive flexibility, also emphasizes that cognitive flexibility is an important factor in understanding the negative effects of FoMO. The findings suggested that people with higher levels of fear of missing out tend to show a decrease in cognitive functioning and diminished capacity to accept difficult internal experiences, experiencing distressing thoughts. FoMO appears to be associated with a pattern of psychological inflexibility in which people become increasingly entangled in thoughts and emotions related to missing out (Nedim Bal e. al., 2025).

A research conducted on medical students which shows that impulsive tendencies significantly leads to sleep disturbances and reduced subjective cognitive functioning. Sample of this study consists of 211 students, attentional and non-planning impulsivity were found to directly predict cognitive decline. There is indirect effect of attentional impulsivity on cognitive performance and this involves a series of smartphone addiction, procrastination in academic activities, decrease and insufficient sleep pattern, and daily fatigue. Non-planning impulsivity demonstrated a similar indirect pathway through procrastination, procrastination in sleep and fatigue. Results showed that both attentional and non-planning impulsivity had a direct relationship with cognitive functioning. Attentional impulsivity is associated with decrease cognitive capacity with a mediation effect of smartphone addiction, academic and bedtime procrastination. The results of this study emphasize how difficulties in maintaining attention and planning tasks undermine self-regulation, which is ultimately leads to poor sleep quality and impaired cognitive functioning (Hamvai et. al., 2023).

A study on 921 chines college students to examine mediating role of sleep quality and cognitive flexibility. With rapid expansion of smartphone use, this problematic phone use has become increasingly widespread among college students and are also linked with many maladaptive behaviors. This study showed that there is significant correlation among high mobile use and poorer sleep quality, lower cognitive flexibility, and weaker time management. Research proves that there is negative correlation between sleep quality and cognitive flexibility, on the other hand a positive relationship between time management disposition and cognitive flexibility and a negative correlation between time management

disposition and poor sleep. These research findings supported our results as these suggesting that problematic use of mobile phone may disrupt both sleep and cognitive functioning, as a result this hinder in effective management of time (Yuan et. al., 2023).

Another study conducted on the topic of social media addiction and phubbing with mediating effect of cognitive flexibility. Different population worldwide use social media extensively, as a result of this a new phenomenon phubbing emerge. 385 university student majority of females studying at eastern turkey state university and completed self-report measures which consisted on cognitive flexibility, social media addiction, and phubbing questionnaire. The results of this study showed that cognitive flexibility mediated and moderated the effect of social media addiction on phubbing. According to the results of this study, cognitive flexibility had mediated negative correlation with social media addiction (Tanhan et. al., 2024).

Cognitive flexibility is described as involving three elements: recognizing multiple options or alternatives in a situation, being willing to adopt, and feeling capable of adjusting one's behavior. Higher level of cognitive flexibility also reflects a general motivation to remain adaptable across situations and the ability to switch attention between different tasks or mental processes. Cognitive flexibility represents an aspect of executive functioning that enables individuals to act in a deliberate, goal-oriented, and future-focused manner. Research has explored cognitive flexibility across multiple domains. Individuals who score higher on cognitive flexibility often demonstrate greater intelligence, better social skills, and lower levels of ethnocentrism (Smith & Konik, 2022).

Rational of the Study

The rapid increase in bedtime procrastination has raised concerns about young adult 's mental and overall well-being. Despite growing awareness of negative effects of poor sleep and digital overuse, many people continually delay going to bed due to habits driven by entertainment, online surfing, and emotional needs. Among the psychological factors influencing this behavior, a new phenomenon fear of missing out has emerge and become particularly relevant in modern society, where staying updated and connected is seen as a social expectation. However, limited research in Pakistani context has examined how bedtime procrastination and FoMO jointly affect individual's life satisfaction.

Furthermore, cognitive flexibility an aspect of executive functioning that enables individuals to adapt their behavior and regulate their habits may play an important explanatory role. People with low cognitive flexibility may struggle to disengage from stimulating activities at night or manage FoMO-driven urges, making them more vulnerable to bedtime procrastination. International research literature demonstrates the important connection among self-regulation, sleep behavior patterns, and overall psychological well-being. Moreover, there is a lack and shortage of comprehensive literature exploring these variables together, particularly within South Asian cultural settings, where daily lifestyle routines, technology usage pattern, and social norms and cultural expectation different from Western populations.

The present study aim is to fill out this gap by providing an explanation of how bedtime procrastination and FoMO predicts a phenomenon named as cognitive flexibility in order to understand the important role of cognitive flexibility in these relationships. The findings of this research will also provide valuable insights for universities, mental health professionals and counselors, and policy makers to develop interventions for people focused on healthy sleep patterns, healthy lifestyle, and cognitive self-regulation.

Objectives of the Study

- To examine the predictive role of bedtime procrastination in cognitive flexibility
- To examine the predictive role of fear of missing out in cognitive flexibility.

Methodology

Research Design

The present study design was correlational cross-sectional research design.

Sample/ Participants

Sample consist of young adults aged 18-24. Sample sized was 200 young adults. Convenient sampling techniques was employed. Excluded those individual how have previous long term medical condition and who use some type of medication. Individual with intellectual deficiency or diagnosed mental health problem were also excluded. Participants who have night time jobs were also excluded.

Sampling method

The present study employed a convenient sampling method to recruit participants. Convenient sampling was chosen because it allows easy access to young adults who meet the study's inclusion criteria and are readily available within academic setting. Participants were selected based on their willingness to take part in the study, their age range of 18-24 years, and their ability to complete the questionnaires independently. This non-probability sampling technique is commonly used in psychological research due to its practicality, cost-effectiveness, and efficiency in obtaining data within a limited time frame.

Measures

Demographic data form was designed to measure participants' age, gender, residence, education, year of education, average bedtime, and sleep duration are all included.

Bedtime Procrastination scale

Bedtime procrastination scale was designed by Kroese et al (2014). A 9-item scale was designed to measure individual's tendency to delay their bedtime and engage in activities that are not conducive to sleep, even when they are aware of the negative consequences of such behavior. Each item in the scale was left blanked so, that it was filled by respondent. Respondent answer item on 5-point scale ranging from 1(almost never) to 5 (almost always). The internal consistency of bedtime procrastination scale was 0.92 that shows that the scale was reliable and valid.

Fear of Missing out scale

The fear of missing out scale (FoMO) was designed by Przybylski, Murayama, DeHann and Gladwell (2013). A 10-item measure of individual's propensity to experience the fear or

anxiety of missing out on social experiences or opportunities when they perceive others are having enjoyable experiences without them. This construct is often associated with social media use, where people may feel they are missing out on events, social gatherings, or experiences they see others sharing online. Each item has a blank box which respondent are directed to fill it according to their own choices. Respondent answer each item on a 5-point scale ranging from 1(not at all true of me) to 5 (extremely true of me). The internal consistency of FoMO is coefficient alpha was .95 which indicates that it's a reliable and valid scale. Internal consistency of FoMO was good and proved by three studies alpha = .87, .90, and .89, respectively.

Cognitive Flexibility Scale

The Cognitive Flexibility scale was developed by Martin and Anderson in 1998. This is 12 item and 6-point Likert scale designed to measure three component of cognitive flexibility. The scale has good reliability as its Cronbach alpha above .70. cognitive flexibility scale possesses both internal reliability and concurrent validity.

Procedure

After obtaining approval from the relevant university ethics committee, the data collection process was carried out in a systematic and ethical manner. Participants was approached through convenient sampling from university classrooms and online student groups. Before filling out the questionnaires, participants were informed about the purpose of the study, their voluntary participation, and their right to withdraw at any time without any consequences. Informed consent was obtained from all participants. The data was collected using a self-administered questionnaire comprising four sections as bedtime procrastination scale, fear of missing out scale, and cognitive flexibility scale. Clear instructions were provided to ensure that participants understood how to respond to each item. Those completing the questionnaire online received a secure google form link, whereas paper-and-pencil surveys were distributed to on-campus participants.

Participants completed the questionnaire in approximately 10-15 minutes. To maintain confidentiality, no personal identifiable information was collected, and all responses were kept anonymous. After data collection, the responses were carefully screened, coded, and entered into SPSS for statistical analysis. Missing or incomplete data were excluded following standard research protocols. The statistical analysis included descriptive statistics, correlation analysis, and regression analysis to examine the predictive role of bedtime procrastination and fear of missing out on cognitive flexibility. The findings were then interpreted in relation to existing literature.

Data Analysis

Descriptive statistics, correlation, and regression analysis were used for the analysis of data.

RESULTS

A total of 200 university students participated in the study. The majority of the participants were between 18-20 years (62%) which indicates that the sample consisted mostly of late adolescents and young adults. In terms of gender, female students represented the majority of

sample (71%). while male students accounted for (29%). Most of the participants belonged to an urban background (53%). Majority of students were undergraduates (82.5%). Regarding year of study, majority of students (36%) enrolled in 1st year, (30%). Majority of young adults' sleep patterns showed that (42%) went to bed before 11 PM. In terms of sleep duration, majority of students (43%) slept 5-6 hours, indicating that many students were not getting sufficient sleep.

Table 2 correlation of variables

Variables	N	M	SD	1	2
Bedtime Procrastination	200	27.39	4.33	-	-
FoMO	200	26.76	6.47	.07	-
Cognitive Flexibility	200	45.93	7.98	.16*	-.15*

Bedtime procrastination has significant weak correlation with cognitive flexibility (r = .16*, p<.05), indicted that when bedtime procrastination is high this leads to increase in cognitive flexibility. Fear of missing out has significant negative weak correlation with cognitive flexibility (r = -.15*, p<.05), indicated that when FoMO is high it leads to decrease in cognitive flexibility.

Table 3 Multiple regression analysis for predicting cognitive flexibility from bedtime procrastination and fear of missing out. (N=200)

Variables	B	SE	β	t	P
Constant	41.996	4.110	-	10.217	<.001
Bedtime procrastination	0.332	0.129	.180	2.571	.011
Fear of missing out	-0.195	0.086	-.158	-2.268	.024

Note: R= .231, R^2= .053, Adjusted R^2= .044, F (2,197) = 5.48, p< .005

A multiple regression analysis was conducted in order to determine whether bedtime procrastination and FoMO significantly predicted cognitive flexibility. The overall regression model was statistically significant, (F (2,197) = 5.48, p<. 005), indicating that both bedtime procrastination and fear of missing out predict cognitive flexibility. It was confirmed from the results that the model counted for 5.3% of variance that is R^2 = .053, indicating a small effect size. If observe individually, bedtime procrastination was a significant predictor of cognitive flexibility (β= .180, t = 2.57, p= .011). It means the higher bedtime procrastination was associated with higher cognitive flexibility. A one-unit increase in bedtime procrastination increases cognitive flexibility by 0.332 units. On the other side, FoMO was a significant negative predictor of cognitive flexibility (β= -.158, t = -2. 27, p = .024). This means that individuals with higher FoMO tend to have lower cognitive flexibility. A one-unit increase in FoMO leads to a -0.195-unit decrease in cognitive flexibility.

DISCUSSION

The current study was conducted in order to examine bedtime procrastination, FoMO, and cognitive flexibility among young adults in Pakistan. The descriptive results revealed that

moderate levels of bedtime procrastination and FoMO present, which is consistent with the patterns observed in collectivistic, technology-driven cultures in Pakistan. From the last decade, Pakistani youth have experienced a rapid increase in mobile phone dependency and social media engagement, which often continues late into the night. In collectivistic societies, staying connected with peers and social circles is considered important for maintaining relationships, which may contribute to higher FoMO and delayed sleep behaviors.

The results data offers a clear breakdown of how bedtime procrastination and fear of missing out relates and predict cognitive flexibility. The results are consistently there to indicate statistically significant correlation. There is significant correlation between bedtime procrastination and cognitive flexibility. There is negative significant correlation between fear of missing out and cognitive flexibility. Sample consists of 200 young adults age range 18-24 both from urban and rural residences. They were predominately students and include both men and women. A research conducted on medical students which shows that impulsive tendencies significantly leads to sleep disturbances and reduced subjective cognitive functioning. Sample of this study consist students, attentional and non-planning impulsivity were found to directly predict cognitive decline. There is indirect effect of attentional impulsivity on cognitive performance and this involves a series of smartphone addiction, procrastination in academic activities, decrease and insufficient sleep pattern, and daily fatigue. Non-planning impulsivity demonstrated a similar indirect pathway through procrastination, procrastination in sleep and fatigue. Results showed that both attentional and non-planning impulsivity had a direct relationship with cognitive functioning. Attentional impulsivity is associated with decrease cognitive capacity with a mediation effect of smartphone addiction, academic and bedtime procrastination. The results of this study emphasize how difficulties in maintaining attention and planning tasks undermine self-regulation, which is ultimately leads to poor sleep quality and impaired cognitive functioning (Hamvai et. al., 2023).

The findings of the present study provide important insights into how bedtime procrastination and fear of missing out has linked with cognitive flexibility. Correlational analysis revealed that bedtime procrastination has significant correlation with cognitive flexibility whereas fear of missing out also have negative significant correlation with cognitive flexibility. The results indicate a significant positive correlation between bedtime procrastination and cognitive flexibility, suggested that young adults especially students delay going to bed tend to demonstrate relatively higher levels of flexible thinking and adaptability. There is one main reason behind this is lifestyle pattern of Pakistani individuals, as they constantly involved in various educational, social, and familial responsibilities and tasks. In all these scenario, people who stay awake at night engage in multiple tasks, doing various problem solving activities, involved in multitasking behaviors, which indirectly leads toward the development of flexible mental strategies. This is also demonstrated that young adults especially students who possess high cognitive flexibility may choose stay awake at night for personal time, for planning goals and doing tasks and also involved in creative thinking late at night.

These results also supported by research conducted in china on chines college students. With rapid expansion of smartphone use, this problematic phone use has become increasingly widespread among college students and are also linked with many maladaptive behaviors. This study showed that there is significant correlation among high mobile use and poorer sleep quality, lower cognitive flexibility, and weaker time management. Research proves that there is negative correlation between sleep quality and cognitive flexibility, on the other hand a positive relationship between time management disposition and cognitive flexibility and a negative correlation between time management disposition and poor sleep. These research findings supported our results as these suggesting that problematic use of mobile phone may disrupt both sleep and cognitive functioning, as a result this hinder in effective management of time (Yuan et. al., 2023).

Meanwhile, there is negative relationship between FoMO and cognitive flexibility. Severe levels of fear of missing out were associated with lower levels of cognitive flexibility. The results of the study align with existing literatures suggested that FoMO increases emotional distraction, social comparison, and compulsive online engagement, all of these factors restrict flexible thinking. Within the Pakistani cultural context, where social connectedness and peer approval hold strong value, fear of missing out create constant mental preoccupation with other's activities. All this further lead to reduced one's cognitive ability to shift thinking patterns, regulate attention, and adapt effectively to changing situations which are core components of cognitive flexibility.

References

1. Alshammari, T. K., Rogowska, A. M., Basharahil, R. F., Alomar, S. F., Alseraye, S. S., Al Juffali, L. A., ... & Alshammari, M. A. (2023). Examining bedtime procrastination, study engagement, and studyholism in undergraduate students, and their association with insomnia. *Frontiers in Psychology*, *13*, 1111038.
2. Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American psychologist*, *55*(5), 469.
3. Canas, J. J., Fajardo, I., & Salmeron, L. (2006). Cognitive flexibility. *International encyclopedia of ergonomics and human factors*, *1*(3), 297-301.
4. Chen, D., Zhang, Y., Lin, J., Pang, D., Cheng, D., & Si, D. (2022). Factors influencing bedtime procrastination in junior college nursing students: a cross-sectional study. *BMC nursing*, *21*(1), 97.
5. Gupta, M., & Sharma, A. (2021). Fear of missing out: A brief overview of origin, theoretical underpinnings and relationship with mental health. *World journal of clinical cases*, *9*(19), 4881.
6. Hamvai, C., Kiss, H., Vörös, H., Fitzpatrick, K. M., Vargha, A., & Pikó, B. F. (2023). Association between impulsivity and cognitive capacity decrease is mediated by smartphone addiction, academic procrastination, bedtime procrastination, sleep insufficiency and daytime fatigue among medical students: a path analysis. *BMC medical education*, *23*(1), 537.

7. Hill, V. M., Rebar, A. L., Ferguson, S. A., Shriane, A. E., & Vincent, G. E. (2022). Go to bed! A systematic review and meta-analysis of bedtime procrastination correlates and sleep outcomes. *Sleep Medicine Reviews*, *66*, 101697.
8. Kroese, F. M., De Ridder, D. T., Evers, C., & Adriaanse, M. A. (2014). Bedtime procrastination: introducing a new area of procrastination. *Frontiers in psychology*, *5*, 89333.
9. Martin, M. M., & Anderson, C. M. (1998). The cognitive flexibility scale: Three validity studies. *Communication Reports*, *11*(1), 1-9.
10. Nauts, S., Kamphorst, B. A., Stut, W., De Ridder, D. T., & Anderson, J. H. (2019). The explanations people give for going to bed late: a qualitative study of the varieties of bedtime procrastination. *Behavioral sleep medicine*, *17*(6), 753-762.
11. Nedim Bal, P., Kahraman, S., & Hündür, U. (2025). A Correlational study of social media-related FoMO and psychological flexibility among adults: an acceptance and commitment therapy perspective. *Asia Pacific Journal of Counselling and Psychotherapy*, 1-15.
12. Przybylski, A. K., Murayama, K., DeHaan, C. R., & Gladwell, V. (2013). Motivational, emotional, and behavioral correlates of fear of missing out. *Computers in human behavior*, *29*(4), 1841-1848.
13. Ryan, R. M., Soenens, B., & Vansteenkiste, M. (2019). Reflections on self-determination theory as an organizing framework for personality psychology: Interfaces, integrations, issues, and unfinished business. *Journal of personality*, *87*(1), 115-145.
14. Servidio, R., Soraci, P., Griffiths, M. D., Boca, S., & Demetrovics, Z. (2024). Fear of missing out and problematic social media use: A serial mediation model of social comparison and self-esteem. *Addictive Behaviors Reports*, *19*, 100536.
15. Sirois, F. M., Van Eerde, W., & Argiropoulou, M. I. (2015). Is procrastination related to sleep quality? Testing an application of the procrastination–health model. *Cogent Psychology*, *2*(1), 1074776.
16. Smith, C. A., & Konik, J. (2022). Who is satisfied with life? Personality, cognitive flexibility, and life satisfaction. *Current Psychology*, *41*(12), 9019-9026.
17. Song, X., Zhang, X., Zhao, Y., & Song, S. (2017). Fearing of missing out (FoMO) in mobile social media environment: Conceptual development and measurement scale. *İConference 2017 Proceedings*.
18. Tandon, A., Dhir, A., Talwar, S., Kaur, P., & Mäntymäki, M. (2021). Dark consequences of social media-induced fear of missing out (FoMO): Social media stalking, comparisons, and fatigue. *Technological Forecasting and Social Change*, *171*, 120931.
19. Tanhan, F., Özok, H. I., & Tayiz, V. (2022). Fear of missing out (FoMO): A current review. *Psikiyatride Guncel Yaklasimlar*, *14*(1), 74-85.

20. Tanhan, F., Özok, H. İ., Kaya, A., & Yıldırım, M. (2024). Mediating and moderating effects of cognitive flexibility in the relationship between social media addiction and phubbing. *Current Psychology*, *43*(1), 192-203.
21. Yuan, Y., He, X., He, Q., Jia, Y., Xu, Z., & Li, M. (2023). Problematic mobile phone use and time management disposition in Chinese college students: the chain mediating role of sleep quality and cognitive flexibility. *BMC psychology*, *11*(1), 440.