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Correlates of social media fatigue and academic performance decrement

A large cross-sectional study

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Abstract

Purpose – The current study aims to investigate if different measures related to online psychosocial well-being and online behavior correlate with social media fatigue.

Design/methodology/approach – To understand the antecedents and consequences of social media fatigue, the stressor-strain-outcome (SSO) framework is applied. The study consists of two cross-sectional surveys that were organized with young-adult students. Study A was conducted with 1,398 WhatsApp users (aged 19 to 27 years), while Study B was organized with 472 WhatsApp users (aged 18 to 23 years).

Findings – Intensity of social media use was the strongest predictor of social media fatigue. Online social comparison and self-disclosure were also significant predictors of social media fatigue. The findings also suggest that social media fatigue further contributes to a decrease in academic performance.

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Originality/value – This study builds upon the limited yet growing body of literature on a theme highly relevant for scholars, practitioners as well as social media users. The current study focuses on examining different causes of social media fatigue induced through the use of a highly popular mobile instant messaging app, WhatsApp. The SSO framework is applied to explore and establish empirical links between stressors and social media fatigue.

Keywords Academic performance decrement, Fear of missing out (FoMO), Online privacy, Self-disclosure, Social comparison, Social media fatigue

Paper type Research paper

1. Introduction

Researchers from a number of disciplines, including health and occupational sciences, psychology and human factors, have investigated fatigue stemming from different real-life situations and experiences; this includes fatigue because of driving and road safety (Brown, 1994; Bener *et al.*, 2017), aviation (Dawson *et al.*, 2017), healthcare (Piper *et al.*, 1987; Wolf *et al.*, 2017), workforce productivity (Ricci *et al.*, 2007), the use of video display terminals (Yu *et al.*, 2017) and sociodemographic factors (Watt *et al.*, 2000). Because of the inherit complexity associated with its conceptualization and cross-disciplinary research, the concept of fatigue has been assessed and defined in multiple ways. For instance, from an occupational health standpoint, fatigue is a multidimensional concept that is subjective in nature and related to feelings of tiredness (Piper *et al.*, 1987). Within psychology and human factor domains, Brown (1994) defined fatigue as the reluctance to continue to engage or perform a given task. Brown (1994) argued that a number of psychological, environmental and socioeconomic factors, in addition to prolonged continuous activity, the availability of breaks and sleep patterns, result in fatigue.

In recent years, researchers have started investigating fatigue associated with the use of information and communication technologies (ICTs; Salanova *et al.*, 2013). More recently, research on the topic but from a social media perspective has also started to surface. In a recent interview, the cofounder and former CEO of YouTube, Chad Hurley, drew attention to the surge in social media data production and consumption, how it is occurring at a phenomenal pace and how it will contribute significantly to users' fatigue. He further elaborates that because of this phenomenon, users will start switching away from these platforms (Turula, 2017). These predictions are gaining traction as, in terms of growth in the active users, engagement and reach has slowed for leading platforms, including Facebook and Twitter (Hoong, 2017).

Social media fatigue is defined as a self-regulated and subjective feeling of tiredness that results from using these platforms (Lee *et al.*, 2016). Because of its subjective nature, different users experience fatigue intensity variably, which can span from tardiness to a state of over-exhaustion (Ravindran *et al.*, 2014). For instance, the users of a particular platform might observe fatigue because of difficulties in managing and understanding the privacy features for shared content. Meanwhile, other users might get overwhelmed while communicating with an ever-expanding network of friends via different platforms. Similarly, scholars have suggested that information, communication and system features overload overwhelm users because the time and energy required to deal with these overloads results in social media fatigue (Ravindran *et al.*, 2014). Some common examples include feeling the need to check multiple times, a swarm of network friends to communicate with and frequently added and updated features.

Social media fatigue has been linked to negative implications not only for users, but also for the platform operators and service providers. From the user perspective, the fatigue caused by social media is likely to have adverse ramifications in terms of psychological and physiological well-being (Shin and Shin, 2016; Lim and Choi, 2017; Pontes, 2017; Sun *et al.*, 2017; Dhir *et al.*, 2018). Likewise, the repercussions of this phenomenon can also be

unfavorable for social media platforms and their associated service operators because users might limit their use, switch or stop using completely, which ultimately impacts profitability (Ravindran *et al.*, 2014; Dhir *et al.*, 2019). Scholars have expressed deep concerns over the significant negative implications for users and business entities and have even suggested the need for an urgent investigation into the different aspects associated with social media fatigue (Oghuma *et al.*, 2016; Shin and Shin, 2016; Dhir *et al.*, 2018, 2019). However, currently, we only possess a limited understanding of how social media fatigue correlates with social media use behavior and academic or work well-being. To address this need, the current large cross-sectional study was organized with 1,870 young adult social media users in India. The present study aims to investigate whether different types of social media use behavior, namely, online privacy concerns, social comparisons, self-disclosure, intensity of social media use and fear of missing out, correlate with social media fatigue. Furthermore, the current study examines whether social media fatigue correlates with academic performance decrement among young adult social media users, which is a popular concern among educators, parents and policy makers.

The current study specifically focused on Indian social media users, mainly because of three reasons. First, the past decade has witnessed a rapid surge in the internet use in India, and it is currently ranked second regarding the total number of internet users (Internet World Stats, 2019). Likewise, the number of social media users in the country is also thriving, and roughly 310 million use different social media platforms, predominantly through mobile handsets (Statista, 2019). Second, despite having an extraordinary user base, Indian social media users are relatively less studied in terms of social media use behavior. The current study is important for four main reasons. First, the number of social media applications and information shared on these channels increases rapidly. Therefore, it is vital for organizations to understand users and associated usage phenomena, such as fatigue. Second, understanding the various aspects of social media fatigue can support companies and relevant stakeholders in providing content that is valued by the customers and can lead to retention. Third, young people indulge a number of social media platforms, and investigating the relationship of fatigue and their well-being (e.g. academic performance) can further broaden our understanding of the consequences of problematic social media use. Fourth, the current study concludes with significant theoretical and practical implications for social media users, service designers, parents, educators, policy makers and practitioners engaged in information management.

2. Background literature and hypothesis development

2.1 Social media fatigue

A review of the prior body of research on social media fatigue indicates that this phenomenon has gained scholarly attention only recently (Table I). From a platform perspective, most studies have concentrated on different aspects associated with fatigue and stress induced through the most notable online social media platforms, such as Facebook (Ravindran *et al.*, 2014; Bright *et al.*, 2015; Cramer *et al.*, 2016; Dhir *et al.*, 2019; Lee *et al.*, 2019), Qzone (Zhang *et al.*, 2016), and social media platforms in general (Logan *et al.*, 2018; Lee *et al.*, 2016; Pontes, 2017; Salo *et al.*, 2017). In comparison, a handful number of studies have been conducted in the context of mobile instant messaging (MIM) apps (Shin and Shin, 2016; Sun *et al.*, 2017; Xiao and Mou, 2019)

Most of these studies have been carried out with participants in developed economies, including the USA (Bright *et al.*, 2015; Cramer *et al.*, 2016), South Korea (Lee *et al.*, 2016; Shin and Shin, 2016; Lim and Choi, 2017), Portugal (Pontes, 2017) and Finland (Salo *et al.*, 2017). More recently, studies from emerging economies such as China, India and Pakistan have also started to emerge (Zhang *et al.*, 2016; Luqman *et al.*, 2017; Dhir *et al.*, 2018, 2019). Our review clearly indicates that more empirical studies on social media fatigue are needed in the context

Study	Platform	Sampling	Theoretical framework	Antecedents	Outcomes
Dhir *et al.* (2018)	Facebook	Two datasets (N = 1,144, 1,554), aged 12–18 years, students in India (56%, 54.5% males)	SSO	Compulsive SNS use, FoMo	Depression, anxiety
Lim and Choi (2017)	Facebook, Twitter, Kakao Talk	446 university students in South Korea aged 19–34 years (56.3% males)	Not specified	Social comparison, social overload, biased opinions, privacy	Emotional exhaustion, switch intentions, resistance
Luqman *et al.* (2017)	Facebook	306 university students in Pakistan aged 19–44 years (62.8% females)	SOR framework	Excessive social, hedonic, and cognitive use	Discontinuance usage intentions
Pontes (2017)	Social media in general	509 school students in Portugal aged 10–18 (53.5% males)	Not specified	Addiction	Depression, anxiety, stress
Salo *et al.* (2017)	Social media in general	32 social media users in Finland aged 20–80 (50% females)	Transaction theory of stress	Social media overdependence, information overload, life comparison discrepancy, online discussion conflict, privacy uncontrollability	Concentration, sleep, identity, and social relation problems
Sun *et al.* (2017)	MIM in general	240 MIM users in China (54.6% females)	Push-pull-mooring (PPM)	–	Switching intentions
Beyens *et al.* (2016)	Facebook	402 school students in Belgium aged 16.41 years* (57% females)	Not specified	Need for popularity, need to belong, fear of missing out	–
Cramer *et al.* (2016)	Facebook	267 university students in USA aged 18–51 years (67% females)	Motives for social comparison	Social comparison, self-esteem,	–
Lee *et al.* (2016)	Social media in general	201 university students in South Korea (59.2% males)	Person-environment (P-E) fit model	Information, communication, and system features overload	
Shin and Shin (2016)	Kakao Talk	334 Kakao Talk users in South Korea (50.3% males)	Stress-coping model	Mobile messenger overload, relational self	Mobile shunning behaviors

Table I.
Review of social media fatigue literature

(*continued*)

Study	Platform	Sampling	Theoretical framework	Antecedents	Outcomes
Zhang *et al.* (2016)	Qzone	525 Qzone users in China (52.4% males)	SSO	Information, social, and system features overload	Discontinuous usage intentions
Bright *et al.* (2015)	Facebook	747 Facebook users in USA aged 18–49 years (52.5 % females)	Limited capacity model (LCM)	SM confidence, SM self-efficacy, SM helpfulness, privacy concerns,	–
Ravindran *et al.* (2014)	Facebook	34 Facebook users aged 18–55 years (52.9% males)	–	Social dynamics, content, immersive tendencies, and platform related factors	Short breaks, controlled activities, suspended activities

Note(s): *Mean age

Table I.

of emerging economies such as India. This will augment our current understanding of social media users, which, until now, has predominately focused on users from the USA and developed countries. Moreover, the cultural diversity lens will further offer novel insights and comparisons about the actual usage patterns and preferences of social media users in different regions of the globe.

Prior literature suggests that scholars have used a number of theoretical frameworks to understand social media fatigue. Most of these frameworks originated from psychology, for example, the stressor-strain-outcome (SSO), stress coping model, stimulus-organism-response (SOR) model and transaction theory of stress (Shin and Shin, 2016; Zhang *et al.*, 2016; Luqman *et al.*, 2017; Salo *et al.*, 2017; Dhir *et al.*, 2019). Studies on social media fatigue have mostly examined social media's correlations with different social media use behaviors, such as compulsive use, fear of missing out, privacy concerns and information, communication, system and social overloads (Bright *et al.*, 2015; Beyens *et al.*, 2016; Salo *et al.*, 2017).

Previous research on the topic has also determined the potential repercussions that may arise because of social media fatigue; this includes an investigation into the possible consequences or outcomes, such as suspended or reduced activities (Ravindran *et al.*, 2014; Shin and Shin, 2016; Zhang *et al.*, 2016; Luqman *et al.*, 2017). In addition to this, many studies have pointed toward the negative psychological and physiological outcomes of experiencing social media fatigue, such as emotional exhaustion (Lim and Choi, 2017), depression and anxiety (Pontes, 2017; Dhir *et al.*, 2018), sleep deprivation, concentration issues and problems in social relationship management (Salo *et al.*, 2017).

Building on the current literature, the present study investigates whether different measures related to social media use behavior and academic well-being (i.e. academic performance decrement) correlate with social media fatigue. Unlike most prior studies, the current study considers fatigue by looking at an MIM app (i.e. WhatsApp) – one of the leading and most popular social media platforms in India and other countries. Despite being a leading MIM platform, WhatsApp is positioned under the umbrella of social media that accommodate Web 2.0 applications, where users create and exchange their own content (Kaplan and Haenlein, 2010). WhatsApp or MIM in general is different from other prominent social media platforms, including Facebook and Instagram. The main core characteristics of WhatsApp distinguishes it from other prominent platforms. These are: first, WhatsApp supports day-to-day communication in synchronous mode with others (individual and group) in the form of text, voice and video. The interactions on WhatsApp are not intended for the

public at large because they are often limited to close contacts or specific social groups. Second, WhatsApp enables its users to share multiple content formats and offer a free alternative to network calling, which sets it apart from other forms of social media. Our observations are consistent with the prior literature on new media, which suggests that the users of different social media use these platforms differently because of underlying affordances and associated gratifications (Miller *et al.*, 2016).

Considering the above premise, the current study expands on and complements the existing literature on the possible antecedents and outcomes of social media fatigue by using lesser known measures in the context of young adult WhatsApp users.

2.2 Online privacy concerns and fatigue

User privacy has been one of the most actively debated topics in the context of social media platforms. Social media platforms are specifically designed to lure users to become active content generators. Maintaining a personal profile and sharing content within the network and publicly exposes people to a number of privacy and security risks, such as identity theft, profile hacking, cyberbullying and online surveillance (Krasnova *et al.*, 2009; O'Keeffe and Clarke-Pearson, 2011). These risks from network externalities translate into user fears, which are often termed privacy concerns. In the present study's context, privacy concerns refer to the users' degree of anxiety about the possibility that their personal, confidential or sensitive information may be monitored, exposed or violated by others within or outside the network.

As social media proliferates and becomes an integral part of the daily lives of many online users, issues associated with privacy become ever more significant. Recent developments, such as the Cambridge Analytica controversy, is one example that raises alarm regarding the privacy of user data (Kuchler, 2018). Recent research indicates that privacy concerns of social media users negatively influence their behaviors, activity levels and trust with these systems (Taddicken, 2014; Malik *et al.*, 2016a, b). Furthermore, being too accessible or getting too much information through these platforms also contributes to privacy concerns among users (Bright *et al.*, 2015). Because of active mentions of privacy issues in the media, stories of privacy breaches, uploaded private and sensitive data and somewhat complex and confusing privacy settings, social media users feel pressured, which can potentially contribute to fatigue.

There are two possible reasons for the possible association between online privacy concerns and social media fatigue. First, when a task, event or activity is executed, then it results in the utilization of a person's cognitive space, which, by its very nature, is limited (Boksem and Tops, 2008). Similarly, when a social media user is too concerned about his or her online privacy, his or her cognitive space is also affected in a way that could lead to social media fatigue. Second, social media users with high privacy concerns are likely to become anxious about their social media use, and this translates into social media fatigue (Bright *et al.*, 2015). However, compared with this, some scholars also believe that social media users with low online privacy concerns are likely to become too accessible or might receive too much content and information from other people (Bright *et al.*, 2015). This is also consistent with the observation of Schwartz (1968, p. 741) that beyond a given threshold, keeping social contacts becomes irritating and thus difficult. Because of this, it is likely that social media users with low privacy concerns might experience social media fatigue. Therefore, we put forward the following hypothesis:

H1. Online privacy concerns among MIM users negatively correlate with MIM fatigue.

2.3 Online social comparison and fatigue

Social media platforms are excellent channels for self-presentation because they facilitate users in generating an image of themselves; the image created on these platforms influences

how people within their network perceive and value a particular user (Goffman, 1959). An extended review of social psychology literature shows that individuals comparing themselves with those who they think are superior (or better-off) may result in negative emotions, including envy or depression. Furthermore, these negative emotions can have a negative impact on health and psychological well-being (Buunk and Ybema, 2003).

Social comparisons occur in various offline contexts, i.e. daily life, but social media platforms simplify and expedite the whole process (Cramer *et al.*, 2016). For instance, Cramer *et al.* (2016) revealed that almost 70 percent of their study participants compared themselves with their Facebook friends. Considering this motive, users tend to post socially desirable and glossy portrayals that aim to optimize a positive self-image and impressions among friends and followers (Mehdizadeh, 2010; Cramer *et al.*, 2016). In doing so, social media users tend to share crafted and selective information about their lives that might not reflect reality. On social media, many users do not personally know or have not met most of their connections, and hence, users tend to form an image of each connection based on shared content (e.g. status updates, pictures, likes and comments). This shared content generally depicts people's lives based on more positive characteristics, such as success, family, wealth and appearance, which might not be true (Qiu *et al.*, 2012). In line with the social comparison theory, these positive life experiences, events and feelings lead other users to be more prone to self-comparisons because they tend to relate that information to themselves and compare their lives to other people's lives (Festinger, 1954).

This exposure to content depicting highly favorable life experiences and gauging one's abilities, performance and life in general can have negative psychological outcomes that negatively impact one's well-being. Because users have been increasingly using their social media for social comparisons, there is a growing interest in the resulting psychological outcomes. The literature has reported a number of psychological and behavioral reactions, such as envious feelings, emotional distress, jealousy and low self-confidence, as a result of comparing oneself with others on social media platforms (Feinstein *et al.*, 2013). There is also significant empirical support to suggest that engaging in social comparisons on these platforms (particularly Facebook and Instagram) poses negative psychological outcomes that are likely to affect users' psychological well-being and mental health, leading to poor life satisfaction, mood swings and depression (Vogel *et al.*, 2015; Kross *et al.*, 2013). Based on the above premise, we argue that carrying out a social comparison on MIM will result in fatigue. Therefore, we hypothesize the following:

H2. Online social comparison among MIM users positively correlates with MIM fatigue.

2.4 Online self-disclosure and fatigue

Sharing information about oneself is one of the key motivations for why individuals use different social media platforms (Qiu *et al.*, 2012; Bazarova and Choi, 2014). Compared with other forms of online channels (e.g. content communities, blogs or collaborative projects), the level of self-disclosure is far higher on social media platforms (Kaplan and Haenlein, 2010). Most of these platforms require users to create a personal profile by adding a display photo and personal information (e.g. name, gender, location and interests).

Similar to communication in offline environments, self-disclosure or sharing personal information is somewhat necessary to effectively use the various features of these platforms and become involved in self-expression, relationship initiation and relationship maintenance (Altman and Taylor, 1973). As the number of social media users grows and the amount of time these users spend on these platforms also increases, many of them are inclined to unmask and share their personal stories, thoughts, feelings and experiences in public and privately. Many users engage in self-unmasking on these platforms with the intention of forming and bonding intimate, meaningful relationships (Bazarova and Choi, 2014).

To achieve these objectives, they disclose personal, sensitive and confidential content without realizing the inherent and somewhat established notion of losing control of their disclosures (Bazarova and Choi, 2014).

A fair amount of literature has highlighted that because of disclosure of sensitive personal information through online self-disclosure, online users become prone to ramifications such as cyberbullying, unwanted sexual solicitation, sexting, online harassment and internet addiction (Krasnova *et al.*, 2009; O'Keeffe and Clarke-Pearson, 2011). For young people, particularly adolescents and young adults, the likelihood of such events in the case of young people is quite high (O'Keeffe and Clarke-Pearson, 2011). Scholars have argued that although these vulnerable groups are being educated about the potential threats present on social media platforms (Vanderhoven, 2014), these groups are tempted to disclose sensitive information because of peer influence and expected rewards (Sheldon and Pecchioni, 2014). In addition, a growing body of literature has linked online self-disclosure with negative psychological well-being, such as anxiety, fatigue and mental stress (Boksem and Tops, 2008; Rains *et al.*, 2016). Based on these findings, it is likely that self-disclosure will exert strain on MIM users in the form of social media fatigue. We hypothesize the following:

H3. Online self-disclosure among MIM users positively correlates with MIM fatigue.

2.5 Intensity of MIM use and fatigue

In the context of social media, across the glove, there is an upward trend in the daily time spent by users. A recent report published by Statista (2019) highlighted that, on average, Web users spend over 2 h (136 min) every day on different social media channels. The excessive use of technology among different cohorts of society has been an active research topic. Studies from a number of disciplines have indicated that high exposure to contemporary gadgets and technologies (McDaniel and Coyne, 2016), mobile phones (Eyvazlou *et al.*, 2016) and social media (Rosen *et al.*, 2013a, b) burdens user behaviors and has negative consequences on psychosocial and physiological well-being. For instance, the study by Thomée *et al.*, (2010) looking at young Swedish adults (ranging from 20 to 28 years old) reported an association of high ICT usage with various mental symptoms, including frustration, role conflicts, time pressure, mental overload, neglect of personal needs and other activities, social isolation and guilt feelings. In another study with adults ranging from 18 to 65 years old (mean = 30.74), the researchers observed a number of clinical symptoms among the heavy Facebook users, including major depression and schizoid disorders (Rosen *et al.*, 2013a, b). Furthermore, a number of recent studies have also reported the impact of social media intensity, including negative psychological outcomes such as loneliness, low self-esteem, depression and exhaustion (Karapanos *et al.*, 2016; Cao *et al.*, 2018; Dhir *et al.*, 2018). Therefore, it is plausible to hypothesize that the intensity of MIM use is positively associated with social media fatigue. We propose the following hypothesis:

H4. The intensity of MIM use positively correlates with MIM fatigue.

2.6 Fear of missing out (FoMO) and fatigue

The fear of missing out (FoMO) is a prevalent unease about missing information, rewards or gratifying experiences that other members of one's network might be enjoying (Przybylski *et al.*, 2013; Elhai *et al.*, 2016). This personality trait connects with the desire to constantly connect with and follow others on different social networks. Prior literature on FoMO has suggested that the desire to persistently stay connected online to monitor or communicate with others is likely to result in the excessive use of mobile phones (Elhai *et al.*, 2016; Cao *et al.*, 2018), the internet in general (Kandell, 1998), online gaming (King *et al.*, 2017) and social media

platforms, particularly Facebook (Przybylski *et al.*, 2013; Alt, 2015; Beyens *et al.*, 2016; Dhir *et al.*, 2019). FoMO on social media can be linked to the impulsive desire or urge to connect on these platforms and engage in activities, for example, chat with others, share or view updates, read or respond to conversations/comments or play social games. On social media platforms, FoMO is usually apparent when the user impulsively wants to connect in inappropriate situations, for example, right after waking up, during lectures or meetings or while driving (Przybylski *et al.*, 2013; Alt, 2015; Hetz *et al.*, 2015).

Like other forms of technology-related anxieties and problematic use, scholars have attributed FoMO to negative physiological and psychological well-being, such as reduced life satisfaction, low self-esteem, inadequacy, high alcohol consumption, depression and physical issues (Przybylski *et al.*, 2013; Elhai *et al.*, 2016). Moreover, individuals with the feeling of FoMO are more likely to have negative emotional feelings, social exclusion and social envy (Hetz *et al.*, 2015). Although FoMO is prevalent in all cohorts of online users, recent studies have reported a higher level of FoMO among adolescents and young adults, i.e. those attending college. For instance, the study carried out by Beyens *et al.* (2016) reported that adolescents with a higher need for belonging and popularity on Facebook experience higher levels of FoMO, which results in intense use of the platform. Furthermore, Facebook users with high levels of FoMO experienced more stress (Beyens *et al.*, 2016). Based on the above premise, we hypothesize the following:

H5. FoMO among MIM users positively correlates with MIM fatigue.

2.7 Academic performance decrement and fatigue

A number of studies have investigated the adverse implications of technology in the workplace and its effects on learning and within social contexts (Ricci *et al.*, 2007; Rosen *et al.*, 2013a, b). These studies found strong evidence of a negative correlation between excessive use of technology and induced stress or fatigue with human performance and output, for example, in gaming (Jackson *et al.*, 2011) and mobile phones (Lepp *et al.*, 2015).

Technologies aimed at gratifying hedonic needs, for example, social media platforms, have very high cognitive absorbing attributes that usually increase users' involvement and dependency (Cao *et al.*, 2018). Spending excessive time on these platforms within and outside the classroom can limit the time spent studying and concentration. Mental preoccupation with these platforms during academic activities will result in an upsurge in psychological stress that ultimately can lead to lower actual performance (Ayyagar *et al.*, 2011). For instance, Kirschner and Karpinski (2010) carried out a study with 218 Facebook users, and they observed a lower self-reported grade point average (GPA) among heavy social media users. Likewise, other studies with US college students found that increased interactions and usage of Facebook contributed to lower actual GPAs (Junco, 2015; Rosen *et al.*, 2013a, b). Some studies have also reported that lower GPA scores are the outcome of excessive mobile phone usage, for example, texting and calling (Hong *et al.*, 2012).

The aforementioned studies in educational settings have measured academic performance by using GPA in a particular subject or GPA for the overall year. Compared with this, the present study has used a more holistic measure: academic performance decrement, first coined by Kubey *et al.* (2001). Academic performance decrement measures the negative impact of social media use on the overall academic performance of a student. For example, it measures whether social media use hurts or disturbs college work and sleep, resulting in exhaustion and a lower GPA. Based on the extended social media literature, we hypothesize that social media fatigue is positively correlated with academic performance decrement because of social media use, as follows:

H6. MIM fatigue positively correlates with academic performance decrement among MIM users.

3. Research methodology

3.1 Research model

To understand and determine the different antecedents and outcomes associated with social media fatigue, scholars have used a number of theoretical frameworks predominantly originating from psychology. For instance, the SOR framework has been used to examine whether excessive Facebook use can lead to discontinuance usage intentions (Luqman *et al.*, 2017). Salo *et al.* (2017) applied the transaction theory of stress to investigate the link between various social networking sites (SNS) stressors and individual/social strains among Finnish social media users. In another study with users of a popular mobile messenger in South Korea – Kakao Talk – researchers used a stress coping model to understand the impact of overload with shunning behaviors (Shin and Shin, 2016). Moreover, push-pull-mooring, the person-environment fit model, the limited capacity model and the SSO have all been used to investigate the antecedents and outcomes of various social media platforms (Sun *et al.*, 2017; Lee *et al.*, 2016; Bright *et al.*, 2015; Kim *et al.*, 2019; Cao *et al.*, 2018; Yu *et al.*, 2019).

To empirically explain the fatigue process associated with MIM use, the research model of the current study uses the SSO framework. We specifically opted for the SSO framework because it perfectly aligns with our study objective, i.e. correlates social media fatigue in terms of its antecedents and outcomes. Koeske and Koeske (1993) originally proposed the SSO framework, and it helps to explain how behavioral outcomes result from different stressors. The SSO illustrates a comprehensive account of the interplay of three major components: stressor, strain and the resulting outcomes (Figure 1). The framework postulates that humans tend to alter their behaviors (outcomes) to minimize the aftermath of detrimental reactions (strains). These strains usually emerge if there is an imbalance between the situation of a person and a requirement of the environment (stressor; Koeske and Koeske, 1993). Because of its origins in occupational health psychology, the model has also been widely used to study stress and fatigue induced through technology use and its outcomes among users (Ayyagari *et al.*, 2011).

In the current study's research model, the stressors are different stimuli represented by social media use behavior, namely, online privacy concerns, social comparisons, self-disclosure, the intensity of MIM use and FoMO. Based on the SSO model, these stressors can trigger various emotional states that are referred to as strains (i.e. social media fatigue). In the final stage of the process, strains could potentially lead to a number of psychological and physiological

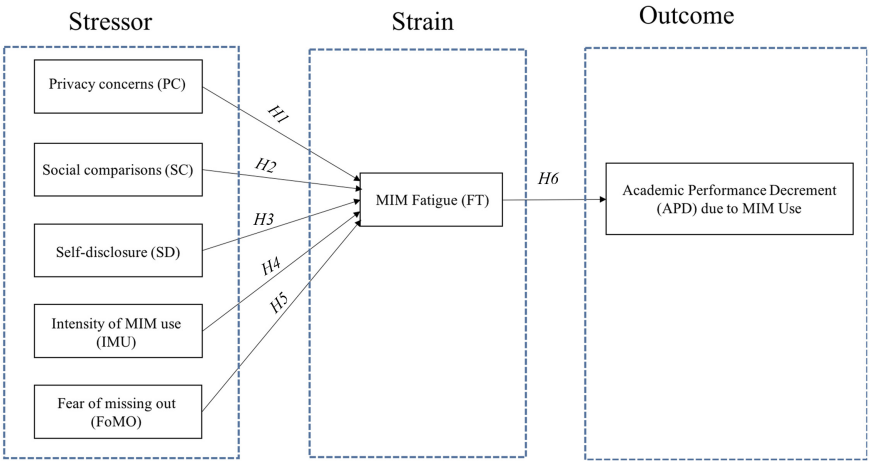

Figure 1.
Research model and proposed hypothesis

outcomes, for example, depression, anxiety (Pontes, 2017; Dhir *et al.*, 2018), behaviors such as shunning or discontinuance (Ravindran *et al.*, 2014; Luqman *et al.*, 2017; Salo *et al.*, 2017; Sun *et al.*, 2017) and a downturn in performance (Lepp *et al.*, 2015; Zhang *et al.*, 2016). Compared with this body of literature, the present study has considered academic performance decrement as a possible consequence of social media fatigue.

3.2 Study participants

The present study consists of two cross-sectional self-reports organized with young adult students attending a large public university in northwestern India. The target population was 17–27-year-old young adults who actively use WhatsApp, a popular MIM application in India. We conducted Study A with 1,398 MIM users (19–27 years old) attending a full-time master's program at the university. The mean age of the study participants of Study A was 22.81 (SD = 4.13), where 57.4 percent (n = 803) were females. We organized Study B with 472 MIM users (18–23 years old) who were only attending a distance education course and were not full-time students at the university. The average age of the participants was 20.30 (SD = 3.13), where 63.1 percent (n = 298) were females. The participants of Study B were different from those participating in Study A because they were not full-time students and instead had full-time employment and were taking part in distance education for career-oriented excellence.

The process for self-reported data collection was as follows: we advertised the proposed study among the target population via different university departments, teachers and advertisement on notice boards. We informed the target user group about the different research objectives and questions, anticipated benefits and related research process. Afterward, we invited the interested students to participate in both studies with the assistance of the respective departments. We organized the survey answering sessions in a classroom environment and internal faculty members monitored the sessions. Before the survey answering exercise, we again informed the study participants about the research process, aims and objectives and anticipated benefits. The study participation was voluntary, meaning that the students could withdraw at any time. Participation was confidential and anonymous; we collected no personal information, except age and gender. We obtained informed oral consent before allowing the students to participate.

3.3 Data analysis

The current study examined the goodness of the model fit through different indices, namely chi-square/degree of freedom (X^2/df), comparative fit index (CFI), Tucker–Lewis index (TLI) and root mean square error of approximation (RMSEA; Kline, 2015). The recommended values for a good model fit include $X^2/df < 3.0$, CFI and TLI ≥ 0.92 and RMSEA ≤ 0.08 (Wang and Wang, 2019). A good model fit shows a close fit between the empirical data and the theoretical research model. We followed a two-step procedure recommended by Anderson and Gerbing (1988). First, we examined the measurement model using a confirmatory factor analysis (CFA) by accessing model fit indices and different forms of instrument validity and reliability. In the second step, we estimated the structural model using structural equation modeling (SEM) to answer the different research hypotheses.

4. Results

4.1 Measurement model

Model A, based on Study A (X^2/df = 4.54, CFI = 0.94, TLI = 0.93 and $RMSEA$ = 0.05), and Model B, based on Study B (X^2/df = 2.44, CFI = 0.94, TLI = 0.92 and $RMSEA$ = 0.06), revealed good model fit (Hu and Bentler, 1999; see Table II).

Study measures (Reference)	Measurement items	Study A		Study B	
		CFA	SEM	CFA	SEM
Privacy concerns (PC) (Dinev and Hart, 2006)	PC1: I am concerned about my privacy on MIM				
	PC2: I am concerned that the information I submit to MIM could be misused	0.65	0.65	0.71	0.71
	PC3: I am concerned that a person can find my private information on MIM	0.86	0.86	0.82	0.82
Social comparison (SC) (Cramer *et al.*, 2016)	SC1: I feel less motivated to use MIM because I compare myself to others on MIM	0.81	0.81	0.77	0.78
	SC2: I feel less motivated to use MIM to avoid comparing myself to others	0.76	0.78	0.76	0.77
Self-disclosure (SD) (Chen, 2013; Krasnova *et al.*, 2009; Wu *et al.*, 2012)	SD1: I have a detailed profile on MIM	0.78	0.76	0.77	0.76
	SD2: My MIM profile tells a lot about me	0.66	0.67	0.69	0.69
	SD3: I reveal a lot of information about me on MIM	0.89	0.90	0.76	0.76
Intensity of MIM Use (IMU) (Ellison *et al.*, 2007)	IU1: MIM has become part of my daily routine	0.68	0.68	0.81	0.81
	IU2: I feel out of touch when I do not use MIM for a day	0.65	0.65	0.70	0.71
	IU3: I feel I am part of the MIM community at the school	0.82	0.82	0.80	0.80
	IU4: I would be upset if MIM shut down or stops	0.70	0.70	0.81	0.80
FoMO (Przybylski *et al.*, 2013)	FoMO1: I fear others have more rewarding experiences than me	0.67	0.67	0.63	0.63
	FoMO2: I fear my friends have more rewarding experiences than me	0.77	0.78	0.76	0.76
	FoMO3: I get anxious when I do not know what my friends are up to	0.85	0.84	0.83	0.83
Fatigue (FT) (Bright *et al.*, 2015)	FT1: I am likely to receive too much information when I am searching on MIM	0.51	0.51	0.52	0.52
	FT2: I am frequently overwhelmed by the amount of information available on MIM	0.78	0.73	0.73	0.68
Academic performance decrement (APD) (Kubey *et al.*, 2001)	APD1: Schoolwork been hurt because of the time spent on MIM?	0.78	0.75	0.80	0.74
	APD2: Sleep late because of using MIM?	0.68	0.68	0.71	0.71
	APD3: Too tired to go to university the next day because too much time spent on MIM?	0.70	0.70	0.74	0.73
	APD4: School percentage been hurt because of the time spent on MIM?	0.76	0.76	0.71	0.70
	APD5: Did not complete homework because of the time spent on MIM?	0.74	0.75	0.80	0.80

Note(s): Study A = regular university students, Study B = distance education students; factor loadings (SEM) and factor loadings structural model (CFA); MIM = mobile instant messaging app (i.e., WhatsApp)

Table II.
Study measures and factor loadings for the measurement and structural models for Studies A and B

4.2 Validity and reliability

We examined convergent and discriminant validity and construct reliability in the context of the study measures used in both the research models.

4.2.1 Convergent validity. The study measures for both Models A and B possess sufficient convergent validity because the factor loadings for the measurement items were above 0.60, and the average variable explained (AVE) for any study measure was above 0.50 (Hair *et al.*, 2013; see Tables III and IV).

4.2.2 Discriminant validity. The study results (across Studies A and B) suggest that the study measures possess sufficient discriminant validity because the square root of AVEs was

greater than the maximum shared variance (MSV) and average shared variance (ASV), and any correlation between any two study measures was below 0.80 (Sarstedt *et al.*, 2014; see Tables III and IV).

4.2.3 Construct reliability. The study measures (across both studies) possess sufficient construct reliability because the composite reliability (CR) for all study measures as greater than 0.70 (Clark and Watson, 1995; see Tables III and IV).

4.3 Structural model

The structural model for both Study A (X^2/df = 5.42, *CFI* = 0.93, *TLI* = 0.91, *RMSEA* = 0.06) and Study B (X^2/df = 2.63, *CFI* = 0.92, *TLI* = 0.91, *RMSEA* = 0.06) revealed good model fit. The percentage variance explained in MIM fatigue for study A was 59.8 percent, and for Study B, it was 70.2 percent. Similarly, the percentage variance explained in academic performance decrement due to MIM use for Study A was 30.9 percent and for Study B was 35.1 percent (Figures 2 and 3). The structural model suggests the intensity of MIM use was a significant predictor of social media fatigue for Study A ($\beta = 0.61$, $p < 0.001$) and Study B ($\beta = 0.62$, $p < 0.001$). Other significant predictors were social comparison (Study A ($\beta = 0.22$, $p < 0.001$); Study B ($\beta = 0.18$, $p < 0.001$)) and self-disclosure (Study A ($\beta = 0.16$, $p < 0.001$); Study B ($\beta = 0.13$, $p < 0.05$)). Compared with this, online privacy concerns and FoMO did not share any relationship with social media fatigue for both Studies A and B. The results also suggest that social media fatigue was a strong predictor of decrement in academic performance across Study A ($\beta = 0.56$, $p < 0.05$) and Study B ($\beta = 0.59$, $p < 0.05$). The study findings support hypotheses H2, H3, H4 and H6 (Table V).

5. Discussion

The negative impact of social media platforms on human well-being is one domain of multidisciplinary interest under the spotlight in the mass media and among social scientists.

	CR	AVE	MSV	ASV	FOMO	SD	PC	FT	SC	APD	IMU
FoMO	0.76	0.53	0.12	0.07	0.73						
SD	0.79	0.57	0.14	0.07	0.13	0.75					
PC	0.82	0.60	0.20	0.08	0.16	0.12	0.78				
FT	0.75	0.60	0.44	0.17	0.25	0.37	0.25	0.78			
SC	0.74	0.59	0.22	0.13	0.34	0.22	0.44	0.35	0.77		
APD	0.85	0.53	0.25	0.15	0.33	0.33	0.22	0.44	0.47	0.73	
IMU	0.80	0.51	0.44	0.18	0.28	0.34	0.33	0.66	0.29	0.50	0.71

Note(s): CR = Composite reliability, AVE = Average variance explained, MSV = Maximum shared variance, ASV = Average shared variance

Table III. Validity and reliability analysis using Study A (N = 1,398)

	CR	AVE	MSV	ASV	FOMO	SD	PC	FT	SC	APD	IMU
FoMO	0.75	0.51	0.13	0.08	0.72						
SD	0.80	0.57	0.21	0.11	0.14	0.75					
PC	0.81	0.60	0.22	0.10	0.27	0.15	0.77				
FT	0.74	0.59	0.50	0.22	0.28	0.46	0.34	0.77			
SC	0.74	0.59	0.22	0.17	0.36	0.33	0.47	0.45	0.77		
APD	0.86	0.55	0.31	0.17	0.33	0.29	0.30	0.46	0.44	0.74	
IMU	0.83	0.54	0.50	0.22	0.26	0.45	0.32	0.71	0.39	0.56	0.74

Table IV. Validity and reliability analysis using Study B (N = 472)

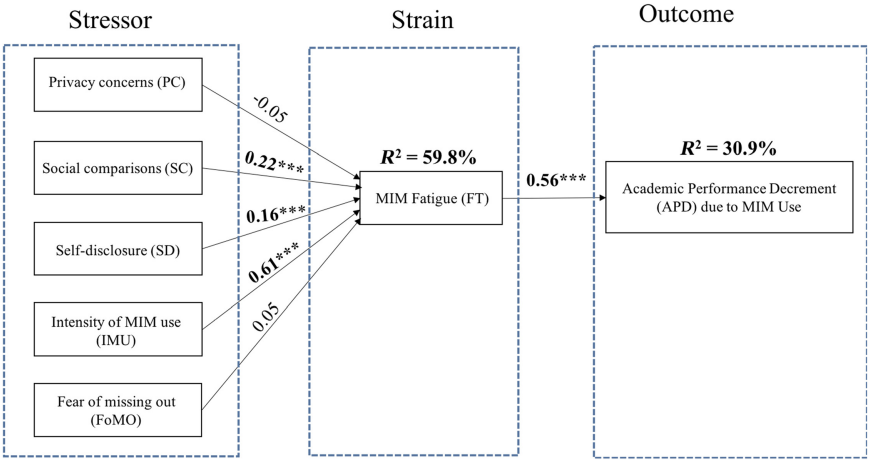

Figure 2.
Results of the structural model (Study A)

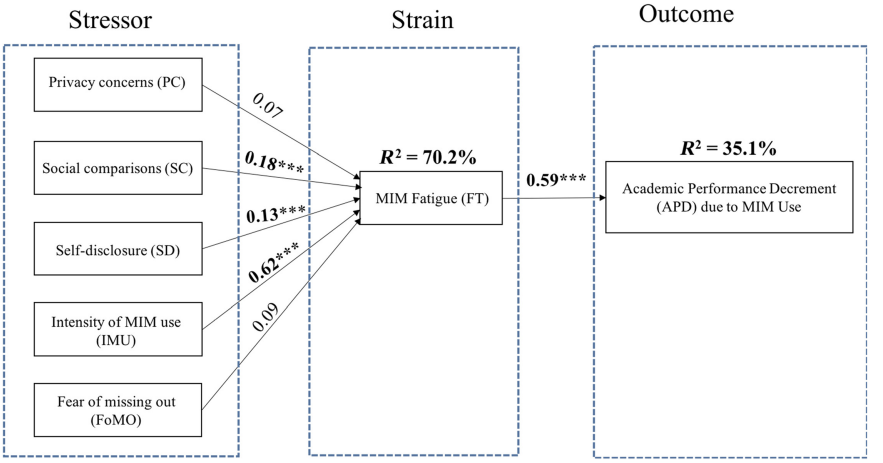

Figure 3.
Results of the structural model (Study B)

		Study A		Study B	
Hypothesis	Path	β	p	β	p
H1	PC → MIM FT	−0.05	n.s.	0.07	n.s.
H2	SC → MIM FT	0.22	<0.001	0.18	<0.01
H3	SD → MIM FT	0.16	<0.001	0.13	<0.05
H4	IMU → MIM FT	0.61	<0.001	0.62	<0.001
H5	FoMO → MIM FT	0.05	n.s.	0.09	n.s.
H6	MIM FT → APD	0.56	<0.001	0.59	<0.001

Note(s): β = standardized regression coefficient, ***p < 0.001, **p < 0.01, *p < 0.05

Table V.
Confirmation of hypotheses (Studies A and B)

The current study builds on the limited yet growing body of literature on a theme that is highly relevant for scholars, practitioners and social media users. The current study has focused on examining the different correlates of social media fatigue induced through the use of a highly popular MIM app: WhatsApp. The current study used a SSO framework to explore and establish empirical links between stressors (namely social comparison, self-disclosure, privacy concerns, intensity of use and FoMO) and social media fatigue. Moreover, we also assessed the repercussions of social media fatigue on academic performance decrement among young adults attending university. We collected a large amount of cross-sectional data (N = 1,398, 472) from the target user group –young adult social media users – to test the research model and its different hypotheses.

H1 investigated whether privacy concerns among MIM users correlate with social media fatigue. The findings from the current study revealed that for both Studies A and B, privacy concerns do not increase fatigue among MIM users. This contradicts prior studies that have highlighted that privacy is an important factor contributing to usage behaviors and fatigue (e.g. Bright *et al.*, 2015). The possible reason behind these conflicting results could be because of the difference in the nature of the social media platform examined in the current study. Most prior studies have examined this relationship, specifically in the context of Facebook or other SNS in general (Bright *et al.*, 2015; Lim and Choi, 2017; Salo *et al.*, 2017). Some have frequently criticized Facebook not only for its privacy practices, but also for its complex and often changing privacy settings (Stern and Kumar, 2014; Kuchler, 2018). By contrast, WhatsApp has been proactively informing users about the feature used for securing their calls and messages through end-to-end encryption. Furthermore, compared with Facebook, the privacy settings of WhatsApp (e.g. status, live location and last seen settings) are not only minimal but simpler and more understandable. It is also plausible that privacy concerns among WhatsApp users do not add to fatigue because the users have a much tighter control over their network (e.g. blocking option for undesired contacts) than an SNS like Facebook.

H2 examined whether social comparisons on MIM results in social media fatigue. The findings from the current study confirmed that social comparison positively correlated with MIM fatigue across both respondent groups. This finding conforms with the new media literature suggesting that comparing oneself with others on different social media platforms results in various behavioral and psychological anomalies, such as jealousy, low self-esteem, emotional distress and exhaustion (Feinstein *et al.*, 2013). Furthermore, users on social media platforms are likely to expend extra energy and time to craft and share content that portrays a glossy and socially desirable self-image on the network (Mehdizadeh, 2010; Cramer *et al.*, 2016). It is highly likely that contemplating about others and contrasting them with one's own life situation can induce fatigue.

H3 investigated whether self-disclosure on MIM induces fatigue among its users. The results from Studies A and B corroborate support for this hypothesis because self-disclosure significantly predicted fatigue across the groups. This finding can be attributed to the pressure of the social network, ease of sharing and platform requirements. The literature on the privacy paradox has suggested that although users on these platforms are concerned about their privacy, the perceived gratifications and desire of self-image and social inclusion can lead users to reveal highly personal, sensitive and confidential information not only on the network, but also in groups and with the public (Taddicken, 2014; Malik *et al.*, 2016a, b). The act of self-disclosure without thinking about the possible outcomes, intended audience or sensitivities of norms and cultures of the social circle has been identified as being problematic in the use of Facebook (Wang *et al.*, 2011). Furthermore, the regrettable disclosures in the form of sharing sexual, political or offensive content under the influence of emotions, alcohol or drugs can result in ramifications of a serious nature (Wang *et al.*, 2011). Moreover, users need to give personal and sensitive information when signing onto an account on these platforms. Based on this, disclosure footprints of varying natures on

WhatsApp, with its large network of friends and active groups (whether intentional, unintentional or forced), can lead to fatigue among users.

H4 probed whether usage intensity by MIM users increases fatigue. The findings from both Studies A and B revealed that intensity of use was the strongest predictor of MIM fatigue. This finding is in line with strong evidence in prior literature, indicating that excessive use of social media platforms, in particular Facebook, can have adverse outcomes for users, including fatigue (Luqman *et al.*, 2017; Dhir *et al.*, 2018). Moreover, this finding is also consistent with the information systems (IS) literature that links high exposure to contemporary gadgets and technologies with detrimental ramifications in terms of users' physical and psychological well-being, such as mental overload, social isolation, depression and exhaustion (Rosen *et al.*, 2013a, b; Karapanos *et al.*, 2016; Cao *et al.*, 2018).

H5 examined whether FoMO is a triggering factor for fatigue among MIM users. The results from both Studies A and B provide evidence that FoMO does not induce MIM fatigue. Some scholars have linked FoMO to a number of negative outcomes in terms of users' well-being, such as depression, low self-esteem, inadequacy and reduced life satisfaction (Przybylski *et al.*, 2013; Dhir *et al.*, 2018). However, we found no evidence of FoMO influencing social media fatigue in the context of MIM. However, the findings align with the recent findings by Dhir *et al.* (2018), which cited an indirect mediating relationship between FoMO and fatigue. It is plausible that social media users experiencing FoMO are more likely to engage in intense social media usage, which later results in social media fatigue. This argument is consistent with relatively recent studies linking FoMO with excessive media use, such as in the realms of gaming (King *et al.*, 2017), mobile phones (Elhai *et al.*, 2016) and social media platforms (Przybylski *et al.*, 2013; Alt, 2015; Beyens *et al.*, 2016; Dhir *et al.*, 2018). We recommend that scholars test the mediating role of intensive social media use between FoMO and social media fatigue.

H6 investigated whether MIM fatigue translates into academic performance decrement among students. The results from both Studies A and B support this hypothesis because fatigue caused by using MIM significantly predicted decrement in students' academic outcomes. Earlier studies in this domain have established some of the behavioral responses, such as discontinued usage intentions or shunning behaviors, which can result from social media fatigue (Shin and Shin, 2016; Zhang *et al.*, 2016; Luqman *et al.*, 2017). Building on these studies, this finding shows that deterioration in the performance outcomes can be a consequence of fatigue on social media platforms. In line with prior IS and new media literature (Kirschner and Karpinski, 2010; Ayyagari *et al.*, 2011), fatigue induced through unchecked or excessive usage of MIM is likely to have a strong negative influence on students' academic outcomes.

6. Study implications

The current study considers a number of theoretical and practical implications for scholars, social media users, parents and teachers, as well as designers and the relevant entities associated with social media use.

6.1 Theoretical implications

To begin with the theoretical implications, the present study has outlined five main contributions to the theory and literature. First, the most significant contribution of the current study is the focus on an MIM app, namely, WhatsApp. Although a predominant number of recent studies have investigated social media fatigue in the context of SNS such as Facebook, interest in other social media applications and tools is increasing, for example, Qzone (Zhang *et al.*, 2016) and Kakaotalk (Shin and Shin, 2016; Lim and Choi, 2017). Consequently, the present study contributes to the limited literature on fatigue from MIM

apps. Our study is also consistent with the recommendations of social media scholars who have strongly emphasized the need to opt for a granular approach by studying different social media platforms because their affordances and relevant implications vary substantially (Bazarova and Choi, 2014; Dhir *et al.*, 2019). The present study could possibly serve as a potential source for comparing the antecedents and outcomes of fatigue because of different social media platforms.

Second, the current study expands the prior literature on social media fatigue by incorporating an SSO framework. The present study examined a number of stimuli (stressors), emotional states of stress (strains) and the performance of respondents (outcome). By providing a comprehensive view of the whole process, the current study complements the initial work on social media fatigue and technostress, which only has examined the relationship between stressors and strains (Bright *et al.*, 2015; Beyens *et al.*, 2016; Cramer *et al.*, 2016; Lee *et al.*, 2016). Furthermore, the current study contributes to the growing literature on the psychological well-being of online users.

Third, the current study extends our understanding of the impacts of the outcomes of social media fatigue. Research has mostly investigated the outcomes of experiencing social media fatigue by looking at behavioral measures or response strategies, for example, activity suspension, switching to other platforms or control strategies (Ravindran *et al.*, 2014; Lim and Choi, 2017; Luqman *et al.*, 2017; Sun *et al.*, 2017), ignoring the impacts on users' performance. To bridge this gap, the current study specifically concentrated on performance outcome (i.e. academic performance decrement) as a result of social media-induced fatigue. The results from the current study revealed that fatigue induced through WhatsApp can significantly and negatively impact students' academic output and. The present study will likely motivate other scholars to better understand the other negative outcomes of social media fatigue, especially in terms of well-being.

Fourth, the current research extends the prior literature on the negative effects or the dark sides of unregulated and inappropriate social media use. As social media platforms become more prevalent among society, there is a strong desire and need to explore and comprehend the downsides of these platforms because most of the research so far has predominantly concentrated on the general usage, motivations and affordances of these platforms (Malik *et al.*, 2016a, b; Khan, 2017; Mamonov and Benbunan-Fich, 2017; Capriotti and Ruesja, 2018). The findings from the current study illustrate the potential of using the literature from social psychology to expand our current outlook on social media dependence. The model in the current study expands the prior literature regarding the downsides of unregulated and inappropriate social media use. Furthermore, by investigating two different batches of study participants, the validity and reliability of the current study's findings are significantly improved.

Finally, despite the upsurge in internet access and smartphone ownership in countries such as India, Pakistan and Turkey (Poushter, 2016), there has been a limited understanding of user behaviors and attitudes in these regions. The current study augments the growing body of knowledge on the negative implications of excessive use of social media platforms in emerging economies (Dhir *et al.*, 2018, 2019; Zhang *et al.*, 2016; Luqman *et al.*, 2017).

6.2 Practical implications

The findings of the current study present a number of implications for social media users, service companies and designers, as well as parents and teachers.

First, examining and connecting the relationships between the various determinants of social media fatigue in an educational context can offer insights into the post-adoption effects and experiences of WhatsApp on students. Being informed about the possible correlations of social media fatigue, users can effectively manage their social media usage. Based on the current study's findings, users should carefully assess their usage and interactions with

different social media platforms. In both of the observed groups, the intensity of use has been the strongest predictor of fatigue, calling for users to proactively consider and opt for strategies to moderate their usage.

Second, educational institutions should hold regular workshops and counseling services to address the issues and concerns related to social media use and abuse. A strong responsibility lies with parents because they should monitor their children's online activities and promote the fair use of social media and other technologies. Recent studies have indicated that the younger generation is more active in using social media and spends a major chunk of their day on these platforms (Wallace, 2015). There is also a strong indication that the unregulated use of modern technologies among youth can potentially have adverse psychological and physiological outcomes, such as depression, anxiety and stress (O'Keeffe and Clarke-Pearson, 2011; Pontes, 2017; Dhir *et al.*, 2018).

Third, the current study's findings also provide a number of implications relevant to practitioners and technology companies in general. Getting insights into the antecedents and consequences of fatigue through different platforms will support companies and relevant stakeholders to tailor their content and marketing strategies in a way that can limit switching, inactivity and permanent deletion by users experiencing fatigue. Because the results from our study reveal a strong negative impact of social media fatigue on students' academic performance, social media developers also need to take their social responsibility role seriously. Rather than focusing on the intensity of usage, companies should strongly focus on facilitating users so that they can efficiently complete their tasks on social media platforms. Offering features and tools (e.g. number of logins, screen time and auto sleep/away mode setup) that can help their users control and monitor their own usage will not only reduce the associated fatigue but will enhance the overall user experience and brand loyalty.

Finally, the insights from the current study can also help developers and service designers make informed design decisions for new and upcoming features, allowing them to address the identified factors causing fatigue among users. For instance, to minimize the unfavorable outcomes in the form of fatigue, social media platforms should carefully consider new features that do not force or entice self-disclosure behaviors.

7. Limitations and future work

Although the current study increases our understanding of a relatively new phenomenon – social media fatigue – the present study also highlights some limitations that could possibly offer directions for future research. Because we used a retrospective approach (i.e. survey), the study participants may have been influenced by reinterpretation and recall bias. Furthermore, due to the self-reported measures, the respondents have responded to the measures with more normative reactions. Although other researchers have extensively used the survey method to understand user attitudes and behaviors in IS domains, adopting a mixed methods approach could offer better reflections on the topic of interest. An analysis of the digital trace data of social media users could potentially be one technique that researchers could combine with surveys to assess, compare and corroborate various measures related to actual activity and network reach (e.g. number of logins, number and duration of chats/calls/group interactions and temporal/geo activity patterns).

Second, because we carried out the current study with the users of a specific social media platform (WhatsApp), the findings might be confined and not applicable to other social media platforms. Furthermore, the generalizability of the current study is somewhat limited because we carried out the study with users sharing certain demographics. However, although the study sample was rather restricted, a significantly strong relationship was observed among the studied constructs. Scholars could replicate the study method in different countries by using a nationally representative sample to complement and validate the current findings.

Third, the number of constructs considered in the current study was somewhat limited. Although we assessed and interpreted various factors, there might be other unobserved external and internal stimuli (family issues, physical and psychological health and interactions with other technologies) that could potentially build up fatigue through MIM use. To create a more conclusive assessment of the phenomenon constructs, such as personality-related traits, age/gender group analysis and actual usage, scholars could use digital trace data in future studies. Moreover, to further complement the current findings related to fatigue outcomes, the physiological data of the users (e.g. multiple sleep latency tests and body mass indexes) could also provide highly valuable insights into the phenomenon.

Finally, despite being one of the most frequently used frameworks, the SSO model has limited capabilities to accommodate personality traits and cultural factors. Future studies can consider examining these factors because they can potentially act as stressors leading to social media fatigue and, consequently, decrement in academic performance. Future work could also use longitudinal and quasiexperimental setups to assess the determinants and outcomes of different social media platforms. For instance, researchers could look at whether monitored or controlled usage of mobile devices or social media in academic or the home environment results in social media induced fatigue. Through these recommendations, the proposed model would not only augment our current understanding but could also be generalized to other social media platforms and users in other contexts.

8. Conclusion

An assortment of affordances, such as constant connectivity, visibility, social feedback and accessibility, make social media platforms highly attractive for users. Increasingly, research has shown that because of unregulated and excessive use of social media platforms, users (particularly the younger cohort) are prone to damaging psychological and physiological outcomes. Building on prior scholarly work on the problematic use of social media, the findings from the current study contribute to the literature by increasing our understanding of social media fatigue and its underlying mechanisms. Using the SSO framework, we examined the role of different practices and behaviors on WhatsApp (privacy concerns, social comparison, self-disclosure, intensity of use and FoMO) on building platform-related fatigue. Furthermore, we observed the relationship between MIM fatigue and performance outcomes (decrement in academic performance) of young adults, which is novel. We collected two large cross-sectional datasets to test the research model and its different research hypotheses. The present study has shown that in relation to WhatsApp use, social comparison, self-disclosure and intensity of use contribute significantly to MIM fatigue, which further translates into decrement in academic performance among university students. By contrast, privacy concerns and FoMO did not share any relationship with MIM fatigue.

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