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A diary study of psychological effects of misinformation and COVID-19 Threat on work engagement of working from home employees

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ABSTRACT

Since the COVID -19 pandemic, the open literature presents plenty of discussions on how individuals have adopted being forced to work from home (WFH). Nevertheless, there hasn't been much information on how individuals perceive WFM is affecting their daily work routine in the pandemic. By applying the stressors-strain-outcome (SSO) framework, the current study develops and tests a model that explains how misinformation and COVID-19 threat triggered the anxiety and social media fatigue of WFH employees and affected their work-related response. This study collected diary data for ten consecutive days from 56 WFH employees. Results widely supported the hypothesized model. Specifically, findings revealed that misinformation and COVID-19 threat increase anxiety and social media fatigue among these employees, resulting in a lower level of work engagement. This study also found that resilience as a coping mechanism reduces the adverse effects of anxiety on work engagement. The results have significant, timely implications for policy and research.

1. Introduction

The coronavirus (COVID-19) epidemic appears to significantly impact public health, causing unprecedented threats to economies and labor markets. Following the World Health Organisation (WHO) recommendations, several steps have been taken worldwide to avoid the spread of the virus. Governments have imposed policies ranging from physical distancing, limits on the freedom of movement, and the suspension of non-essential businesses and events, to the lockdown of whole cities in different parts of the world (Jha et al., 2021; Sakurai and Chughtai, 2020). As the level of epidemic persists, the measures taken to fight it by governments are also increasing. The reduction in face-to-face contact is a significant action to reduce the impact of COVID-19. Around 61 % of the world's total population, including 81% of employees currently lives in countries with planned or needed workplace closures (ILO, 2020). In this new world, employers have to be prepared to change and develop contingency plans to respond to various measures as these kinds of situations arise. Many businesses are considering working from home (WFH) as a temporary or alternative work arrangement.

WFH is a work arrangement in which an employee fulfills the essential duties of his or her job while staying at home, utilizing information and communication technology (ICT). For this study and in the context of the COVID-19 pandemic, the term "work from home" is used to refer explicitly to home-based teleworking as a remote, replacement

working arrangement. To ensure business stability and employment for both employers and workers involves joint responsibility and engagement. Although the use of technology, in general, is not a recent phenomenon, its sudden and compulsory existence has created new challenges for management due to COVID-19 (Hunt, 2020; H. Liu et al., 2021). It has been stated that the use of ICT for WFH has several advantages, including reduction of costs and ease of work (Chadee et al., 2021). Not all have felt the commonly proclaimed impacts of WFH. Research has shown that a significant number of employees feel burnt out from balancing work and home demands and are less engaged in work (Kurtz et al., 2020). A report shows that, depending on the place of job and the characteristics of different professions, new communication technology enables a stronger overall work-life balance but often blurs the boundaries between work and personal life. It may raise stress, anxiety, exhaustion, and other health problems for the home worker (Bible, 2020).

WFH or digital work interaction captures the usage of specific devices, like embedded networks and social media apps (e.g., Facebook, Skype, WhatsApp), by an organizational employee to communicate with colleagues for work or work-related matters (Chadee et al., 2021). On the one hand, social media provide a way to connect with colleagues for work-related purposes (Bano et al., 2019; Ali Nawaz Khan, Ali, et al., 2019); on the other hand, there is a dark side of social media which is fake news or misinformation. The phrase "misinformation" is described

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as false or incorrect information, creating confusion among those who read it (Islam et al., 2020). The current pandemic misinformation about COVID-19 is prevalent on social media, which can hamper individuals psychologically (Lee et al., 2020; Pennycook et al., 2020). Recent studies indicated the effects of social media misinformation and COVID-19 threat on users' mental and psychological health (Islam et al., 2020; Labrague and Santos, 2020; Lee et al., 2020; Rajkumar, 2020). By applying affordance and cognitive load perspective, Islam et al. (2020) investigated the role of social media misinformation on the level of social media fatigue. Similarly, Killgore et al. (2020) stated that misinformation related to COVID-19 might induce a level of anxiety among U. S. adults. However, the consequences of these psychological and mental health issues are under-investigated, especially in COVID-19 and WFH.

Nevertheless, some protective factors may have worked in helping to prevent the negative impacts of social media misinformation and COVID-19 on outcome variables. Resilience is an essential defensive mechanism for people facing adversity (Zhao et al., 2018). Resilience as a dynamic course can play a protective role in fatigue's adverse impacts that arise from COVID-19 threats on social media (Sakurai and Chughtai, 2020). Empirical findings have shown that resilience moderated the relationship between COVID-19 threat and anxiety (Paredes et al., 2021). However, investigation of resilience as directly or indirectly buffering the adverse effects of social media misinformation, COVID-19 threat, through anxiety and social media fatigue on work-related outcomes has been scarcely studied especially in the context of WFH. Taking together, misinformation, COVID-19 threat, anxiety, social media fatigue, and resilience all play an important role in the WFH context and may influence work engagement daily. Hence, addressing the gap in past research, this study utilized the stressor-strain-outcome (SSO) framework to assess the antecedents and outcomes of anxiety and social media fatigue. This study also explores whether anxiety and social media fatigue mediate the association between misinformation and COVID-19 threat and outcome variables daily and evaluates a moderated mediation model. In the moderated mediation, resilience might play a role as a moderator in the direct and/ or indirect effect of misinformation and COVID-19 threat on work engagement.

The present research contributes by enhancing scholars' understanding of misinformation and COVID-19 threat, an area of research that has gained significant interest but still needs further empirical research. This study also contributes by examining the precursors of social media fatigue and anxiety from the viewpoint of the stressor-strain-outcome framework. Moreover, this study includes social media fatigue and anxiety as two different strain factors resulting from misinformation and COVID-19 threat. Therefore, this study expands the research on WFH in the context of the COVID-19 by taking into account the determinants of work engagement. Furthermore, this study tested the buffering effects of resilience on the direct relationship of social media fatigue and anxiety on work engagement and moderated mediation effects. Finally, to date, several studies have highlighted the complex nature of the psychological structures of employees, such as well-being and psychological distress (Garfin et al., 2020; Gaudioso et al., 2017; Islam et al., 2020; Lee et al., 2020). But, the variations in attitudes and cognition have not been studied. By applying the SSO framework (Ayyagari et al., 2011) this study proposes that day-level misinformation and COVID-19 influence the day-level work engagement through day-level social media fatigue and anxiety.

2. Theoretical Framework and Hypotheses Development

2.1. Stressor-strain-outcome

The research model presented in this study to demonstrate stress mechanism is based on the stressor-strain-outcome model (Koeske and Koeske, 1993). From the information system perspective, social media stimuli, as illustrated by its features, will cause social media strains that

will have adverse implications (Luqman et al., 2017; Um and Harrison, 1998). Past research has shown that the environment plays a major role in the growth of addictive behavior (Khan et al., 2021; Cao et al., 2020). A stressor is described in the SSO context as any environmental stimulus that appears to social media users to be distracting, annoying, or harmful. Ayyagari et al. (2011), surmised, consistent with this perspective, that technology characteristics will cause technology-related stressors, which would ultimately influence job outcomes. Harmon and Mazmanian (2013) confirmed that mobile phone-based email checking creates conflicts between work and social life during non-work hours. Likewise, Zhang et al. (2016) demonstrated that social media fatigue and dissatisfaction, perceived system features, social overload, and information trigger strains. Research has thus established that psychological reaction intercedes with the effect on outcome variables of perceived stressors.

This study applied the SSO paradigm by treating environmental stimuli (as stressors) in the context of WFH during COVID-19, which is relatively ignored in the current literature; the researcher follows a cognitive-behavioral model to explain the negative effects. Maladaptive cognition is the central factor of the cognitive-behavioral model, the intensity of which is likely to generate symptoms (Luqman et al., 2017). The relations between cognition and behavioral effects attributed to social media use are clarified by cognitive-behavioral theory. As a necessary condition to encounter negative consequences, this study uses the social media misinformation and COVID-19 threat as the primary basis that causes behavioral responses as stressors. The current research constructs this inference based on social cognitive theory (Bandura, 1989). The addictive level of social media is not addressed, as this study concentrates on how social media misinformation and COVID-19 threat are connected to adverse outcomes. Behavioral regulation refers to the ability to inhibit, disrupt, or modify desired and impulsive cognitive and behavioral responses (i.e., feelings and behaviors) so that an individual can ultimately reduce or prevent problematic behaviors (Khan et al., 2021; Turel, 2016; Islam et al., 2021). This study uses resilience (as cognitive behavior control) to modulate the relationship between strain and behavioral response.

This study used two main types of experiences that WFH users counter on social media during their interaction with colleagues. The first type, "anxiety" is described as an omnipresent state of mind concerned about possible difficult circumstances or threats (Dhir et al., 2018). The second type is "social media fatigue," which is defined as "a subjective and self-evaluated feeling of tiredness from social media usage" (Lee et al., 2016; Xiongfei et al., 2019). The dependent variable, work engagement, is described as "one's tendency to see work positively and fulfilling, with vigor, devotion, and absorption" (A. N. Khan, Khan, et al., 2019; Schaufeli and Salanova, 2007). While implementing the SSO framework, the researchers examined the link between stress-related outcomes and work engagement. For example, Gaudioso et al. (2017) studied the mediating roles of strain facets and coping strategies in interpreting techno-stressors into adverse job outcomes. However, studying the negative effects of social media in the context of pandemic and WFH, researchers ignored this area. Therefore by applying the SSO framework, this study examines how the use of sequential processes involving social media misinformation, COVID-19 threat, anxiety, and social media fatigue will influence the work engagement in the context of WFH during the COVID-19 pandemic.

2.2. Social media misinformation, anxiety, and work engagement

Misinformation has been described as "incomplete or misleading information, particularly that which is intentionally intended to be deceptive" (Laato et al., 2020). Problems are rising that people's mental health is adversely affected by false news and misinformation regarding the ongoing global crisis. Health professionals and government officials are worried about the rising amount of online misinformation about COVID-19 and its impact on internet users' mental well-being (Cheng

and Luo, 2020). As the ongoing coronavirus outbreak continues to impact the lives of all, across the internet and social media, individuals are seeking to learn more about the virus and how to remain healthy. There is a range of questions about what is known as an 'infodemic' of online distribution of inaccurate facts that involve potentially harmful advice on 'cures' for COVID19, alarmist government conspiracy stories, and anti-Asian disinformation that all contribute to stress and anxiety for those already affected by the global lockdown (Apuke and Omar, 2020). Recently scholars have suggested that misinformation about a pandemic is related to psychological health problems, anxiety, and depression (Lee et al., 2020; Pennycook et al., 2020). Likewise, it has been reported that stressors in social media are primary inducer of anxiety (Dhir et al., 2018) which is lethal form mental health (Liu et al., 2020) as well as personal and work life (Elmelid et al., 2015; Spell and Arnold, 2007).

With drastic changes in lives and livelihoods, the COVID-19 crisis has been psychologically devastating for peoples, and the next stages bring significant ambiguity. Scholars proposed that exposure to death induces anxiety, stimulates self-protective behaviors, avoidance behaviors, and reduces work engagement (Grant and Wade-Benzoni, 2009). However, other scholars have proposed that it helps individuals put life in perspective, conquer challenges, and provide others with more support (Yuan et al., 2019; Liang et al., 2021). Then the question arises, under what circumstances does COVID-19-activated anxiety and fatigue affect work engagement? Employees appear to have decreased information processing when they experience extreme anxiety (Gino et al., 2012), lead to work disruptions and distractions (Eysenck and Byrne, 1992), and have a work lower level of work engagement (Hu et al., 2020; Khan et al., 2021). SSO framework also suggests that stressors (misinformation in this case) may lead to strain (anxiety) which will affect the outcome (work engagement) and whole process adversely (Um and Harrison, 1998). Therefore, the following hypotheses were suggested:

H1a. *Day-level Social media misinformation will increase the daily level of anxiety among WFH individuals.*

H1b. *Day-level Anxiety will decrease the daily level of work engagement among WFH individuals daily.*

H1c. *Day-level Anxiety will mediate the relationship between day-level social media misinformation and day-level work engagement among WFH individuals.*

2.3. Social media misinformation, social media fatigue, and work engagement

Due to a lack of information about the matter, the Covid-19 pandemic has caused frustration in the global community. As a consequence, over the past few months, the distribution of misinformation have significantly increased. There has been a flood of COVID-19-related material since the virus broke out, mostly misleading or incorrect (Pennycook et al., 2020). Research indicates that the hindrance of mental health is correlated with social media and the dissemination of misinformation (Laato et al., 2020). Besides, false news causes a state of panic that has been connected to psychiatric disorders (Lee et al., 2020). In our current situation, these factors are still important. Still, over the past few months, the scope of social networking site-related distress has grown. It seems to be expanding to subsets of workers who have not previously reported encountering it. What is currently happening may be an example of a phenomenon called "social media fatigue," which is characterized as negative feelings of fatigue and being exhausted by the use of social media as a result of information and communication overload (Bright et al., 2015). This feeling of overload may be exacerbated by the rise in sociopolitical and pandemic-related content being disseminated on social media (Pitafi, Kanwal, et al., 2020; Xiongfei, et al., 2019 Khan, Ali, et al., 2019).

Besides, multiple studies have shed light on who is at higher risk of social media fatigue and ways to handle it better. Bright et al. (2015) found that higher social media fatigue rates were reported by users who had a high degree of self-efficacy while using social media and who perceived social media as a helpful resource. These results indicate that people who feel secure using social media and have positive views appear to spend substantially more time on social networking websites, thus raising their risk of communication and information overload. The trust these people feel may probably prevent them from being aware of the potential of such overloads. Talwar et al. (2019) suggest that individuals who have a great desire to verify the information they find on the internet often have higher levels of social media fatigue. Recent research by Islam et al. (2020) built on this quest for risk factors of social media misinformation, identifying that people with low skills in self-regulation are at greater risk of fatigue from social media. This study found that people who are described as "explorers," representing those who want to search for new topics and content with interest and transparency, are also at higher risk of fatigue from social media.

Individuals explore social media for work-related motives and perform different tasks (Hollis and Was, 2016; Kakar and Khan, 2020; Pitafi et al., 2020; Khan, et al., 2020). When trying to pursue information to complete work tasks via social media, individuals may be led to a large amount of information to deal with which may contribute to information overload (Edmunds and Morris, 2000); or technology overload (Karr-Wisniewski and Lu, 2010; Yu et al., 2018) and may eventually contribute to social media related fatigue (Bright et al., 2015). Communication regularly via IM can lead to employee distractions when executing their job task (Mansi and Levy, 2013), leading to loss of productivity and performance (Raza et al., 2020; Y. Sun and Zhang, 2020). Several studies have applied the SSO model to investigate the adverse effects of social media use on work-related outcome variables through exhaustion and fatigue (Um and Harrison, 1998; Yu et al., 2018). In the context of WFH, job engagement is a critical construct (Kurtz et al., 2020). Most of the past researchers included job performance (Brooks, 2015; Castilho et al., 2017; Wu, 2016) as an outcome variable in a work-related context, however, little to no attention has been paid to the importance of work engagement. By applying the SSO framework and based on the above discussion, this study expect that social media misinformation as a stressor will increase the level of social media fatigue in the form of strain which will lead to a lower level of work engagement as an outcome in the context of WFH individuals and propose following:

H2a. *Day-level Social media misinformation will increase the day-level social media fatigue among WFH individuals.*

H2b. *Day-level Social media fatigue will decrease the day-level work engagement among WFH individuals.*

H2c. *Day-level Social media fatigue will mediate the relationship between day-level social media misinformation and day-level work engagement among WFH individuals.*

2.4. COVID-19 threat, anxiety, and work engagement

COVID-19, an infectious respiratory disease, is an unprecedented global health epidemic and humanity's most challenging problem (Garfin et al., 2020; Liu et al., 2021; Islam et al., 2021). This crisis has started to take its toll on the economy, businesses, and employees as the rate of infections and fatalities rises. Our lives and livelihoods are threatened by this global crisis, causing immense ambiguity and uncertainty (Abdel-Basset et al., 2021; Sakurai and Chughtai, 2020; Islam et al., 2020). Vast numbers of non-essential employees need to work from home and feel increased isolation, depression, and anxiety that can influence individual behaviors in and out of work. In organizational management research, the profound effect of this crisis triggers many

important but unanswered questions. Moreover, by infecting millions and killing thousands COVID-19 has become terrifying pandemic for global community. Threat management studies have shown that empirical signs of death can induce emotional state of anxiety, and damaging well-being (Burke, 2010). As a death sign, we then question, how does COVID-19 influence employee emotions and behaviors?

COVID-19 is a fatal disease that increases the sensitivity of mortality. At the same time, mortality caused by COVID-19 may vary every day and from individual to individual as the situation evolves. In this deadly crisis, when people are reminded of mortality, they face crippling fear and experience enhanced anxiety, confusion, and concern about both their lives and their wellbeing at present and in the long run, all of which result in a higher level of anxiety (Gino et al., 2012). In this paper, by applying the SSO framework, this study anticipates that COVID-19 threat as a stressor will increase the fear level of death among WFH employees daily. They will encounter anxiety as a strain that will lead to distraction from work as an outcome of that threat and anxiety. Thus, the following hypotheses were suggested:

H3a. Day-level COVID-19 threat will increase the day-level anxiety among WFH individuals.

H3b. Day-level Anxiety will mediate the relationship between day-level COVID-19 threat and day-level work engagement among WFH individuals.

2.5. COVID-19 threat, social media fatigue, and work engagement

Social media fatigue has been related to increased anxiety and depression (Dhir, Yossatorn, Kaur, and Chen, 2018). Moreover, there is strong evidence that the threat of COVID-19 on social media can adversely affect well-being and happiness (Paredes et al., 2021). Researchers have shown that the danger of social media exposure to COVID-19 during the COVID-19 pandemic has influenced psychological well-being and behavior. The severity of mental health issues, for instance, is linked to the level of exposure to social media during COVID-19 (Gao et al., 2020). This study applied the SSO model in the current study to examine the association between COVID-19 threat and psychological and work-related outcomes during COVID-19. The SSO was employed to investigate the use and effects of social media (Dhir et al., 2018; Lee et al., 2016; Luqman et al., 2017); and is an acceptable model for the current study because this model examined stressors (i.e., COVID-19 threat), strains (i.e., social media fatigue), and outcomes (i.e., work engagement; Figure 1). Thus, the following hypotheses were suggested:

H4a. Day-level COVID-19 threat will increase the day-level social media fatigue among WFH individuals.

H4b. Day-level Social media fatigue will mediate the relationship between day-level COVID-19 threat and day-level work engagement among WFH individuals.

2.6. Moderating role of resilience

In keeping with earlier studies, people react differently to feelings of a threat and their related anxiety (Eysenck and Byrne, 1992; Lykken, 1957). In particular, COVID-19 threat and misinformation triggered anxiety can lead to negative thinking about this threat (Forgas, 1998) and self-protective, avoiding, distrustful behaviors (Fredrickson, 2001) so that individuals can work without being overloaded by the anxiety (Grant and Wade-Benzoni, 2009). This results in reducing the commitment to work and deviating from work mentally, emotionally, and cognitively (Kahn, 1990). They appear to have impaired information processing when workers experience extreme anxiety (Gino et al., 2012), which leads to job delays and disruptions (Eysenck and Byrne, 1992), and have a weaker desire to work engagement. Nevertheless, when individuals have resilient psychological resources, such as feeling the meaning and importance of life, the adverse effects of anxiety and social media fatigue associated with negative workplace behaviors can be mitigated (Greenberg et al., 1986).

Adverse effects of COVID-19 related crises can be minimized by applying resilience as a personal resource (Liu et al., 2020). COVID-19 has changed the way peoples work. Maintaining resilience is paramount for workers to survive and prosper in this new paradigm. Resilience is the capacity of an individual or system to cope with disruptions while preserving their core practices and objectives (Sakurai and Chughtai, 2020). For people who are faced with adversity, resilience is considered a key defensive factor. As a dynamic course, resilience can play a role and motivate a person to develop in the hardest of times, based on the resilience system (Karol, 1999). Resilience is a promising factor to reduce negative feelings and help preserve older people's well-being (Hardy et al., 2004). Empirical findings have shown that resilience reduces the adverse effects of anxiety (Liu et al., 2020). Therefore, like cognitive behavior control, this study expects that resilience will moderate the damaging effects of anxiety and social media fatigue on work engagement and the mediating mechanism between social media misinformation, COVID-19 threat, and work engagement. Thus, the following hypotheses were suggested:

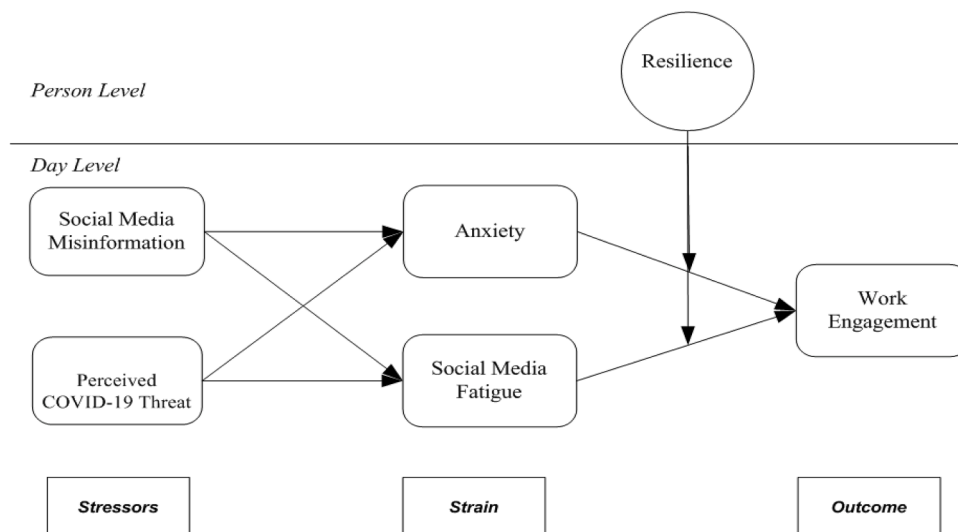


Fig. 1. Study Model.

H5a. *The day-level damaging effects of anxiety on day-level work engagement will be lesser when a person is higher at resilience level as compared to low.*

H5b. *The day-level damaging effects of social media fatigue on day-level work engagement will be lesser when a person is higher at resilience level as compared to low.*

H5c. *Resilience will moderate the relationships in H1c in the way when the level of resilience is high these indirect effects are less negative as compared to when resilience is low.*

H5d. *Resilience will moderate the relationships in H2c in the way when the level of resilience is high these indirect effects are less negative as compared to when resilience is low.*

H5e. *Resilience will moderate the relationships in H3b in the way when the level of resilience is high these indirect effects are less negative than when resilience is low.*

H5f. *Resilience will moderate the relationships in H4b in the way when the level of resilience is high these indirect effects are less negative as compared to when resilience is low.*

3. Research Methodology

3.1. Participants and procedure

For this study, researcher invited government sector teachers from government schools in Pakistan through social media (i.e. Facebook and WhatsApp). Due to the COVID-19 pandemic, these teachers are working from home and performing their teaching as well as some administrative duties. With an initial online survey followed by regular surveys for ten consecutive working days, data was collected to reveal the daily changing conditions of COVID-19. After discussing the research process and incentives, the researcher requested 160 teachers to participate in the online survey. In total, 92 teachers responded to the initial survey, including demographic and resilience measures. The daily surveys were sent twice a day to those 92 teachers. At 10 a.m., the morning survey was sent out, which includes perceived COVID-19 threat and social media misinformation evaluation. The evening survey was submitted at 5 p.m. and included anxiety, social media fatigue, and work engagement. An ID number was allotted to every participant, and responses were matched based on those ID numbers. For the full participation, the researcher paid each participant a sum equal to USD 15. As it happens in daily diary studies, most participants haven't completed surveys for all ten days and were dropped from the final analysis (Sun et al., 2016). The researcher collected 412 matched day-level data points from the 56 teachers who completed the daily surveys (a potential total of 560 out of 56 final teachers) for a reasonable response rate of 74 percent. In the final data set, 48.3 percent were female, the average age was 37.2 (SD 7.66), and the average experience was 5.26 years (SD 1.8).

3.2. Measurement

All variables were measured on a five-point Likert scale where 1 = strongly disagree and 5 = strongly agree. In the wording of the items, minor changes were made to modify them in the study context. Age, gender, and experience were added as demographic characteristics of the respondents.

3.2.1. Social media misinformation

This study applied three questions based on the Wei et al. (2010) and Cheng and Luo's (2020) scale, after some modifications, to examine the cognitive elaboration of misinformation among the participants. Sample items included "During the COVID-19 pandemic, I daily recall the

misinformation and reflect on some related issues." Teachers answered these questions on daily basis (α averaged daily = .84).

3.2.2. Perceived COVID-19 threat

This study used four items based on the Tyler and Cook's (1984) study to quantify perceived COVID-19 threat, which is also used recently (Paredes et al., 2021) by identifying COVID-19 pandemic as the threat term. The daily level of consciousness about "the severity of the pandemic" was one of the items included. Teachers answered these items on daily basis (α averaged daily = .82).

3.2.3. Anxiety

For measuring the anxiety this study used five items scale developed by (La Greca and Lopez, 1998). Sample item includes "I worry about what others say about me". The teachers answered these statements on their daily level of anxiety (α averaged daily = .87).

3.2.4. Social media fatigue

Social media fatigue was measured by utilizing measures from the study of Bright et al. (2015). One of the items from the three items scale was "During the day I am frequently overwhelmed by the amount of information available on social media". The teachers responded about the daily level of social media fatigue (α averaged daily = .83).

3.2.5. Work engagement

Work engagement was assessed using the nine-item scale from the Schaufeli et al's (2006) study. Sample item included "today I feel bursting with energy". Teachers rated how well each item described them every day (α averaged daily = .89).

3.2.6. Resilience

To test resilience as a personality trait, this study used nine items scale from Connor and Davidson's (2003) study. One of the sample questions was "When things seem hopeless, I don't give up". I ask participants to evaluate the condition they thought matched their thinking quality or personality (α = .83).

4. Analytical Method

Multilevel modeling (MLM) approach (Bryk and Raudenbush, 1992) has been applied for analyzing the data to model the relationship between day-level social media misinformation, perceived COVID-19 threat, anxiety, social media fatigue, and work engagement. The MLM was also used to analyze person-level resilience and its moderating effects. Day level responses are (level 1) nested inside person level (level 2) responses. Therefore, day-level variables are nested within person-level variables. By following Hofmann's (1998) centering technique, day-level variables are centered on the mean of the individual to decrease the variance between individuals. Person-level factors were based on the grand-mean centering.

4.1. Results

Before evaluating the hypotheses, the proportion of variance attributed to the two levels of analysis was evaluated. The intraclass-correlation coefficient (ICC) was calculated for the variables assessed daily. The ICC is defined as the proportion of the difference between persons, either the within-person variance or error term, due to the portion of the variability (Shi et al., 2021; Xiongfei et al., 2021). ICC was calculated as: (day-level variance) / (day-level variance + person-level variance). Variance partitioning specified that a significant amount of variance in the variables was explained by day-level fluctuations: 62% in social media misinformation, 69% in perceived COVID-19 threat, 75% in anxiety, 68% in social media fatigue, and 57% in work engagement. Therefore, the MLM technique was suitable to test the hypotheses (Chen et al., 2018; Kenny et al., 2003).

Table 1 outlines the descriptive and inferential statistics and correlations between the variables in the study. The correlation coefficients for the examined variables are consistent with the suggested hypotheses. Social media misinformation, for instance, correlates positively with anxiety ($r = 0.57, p < .001$), and negatively with work engagement ($r = -0.57, p < .001$), similarly, perceived COVID-19 threat was positively correlated with social media fatigue ($r = 0.42, p < .001$), and negatively with work engagement ($r = -0.58, p < .001$). Furthermore, since variables were assessed repeatedly over two weeks, I checked if there were any time patterns in the mediator and independent variable (Kim et al., 2018). In each regression model for anxiety, social media fatigue, and work engagement, I entered the vector of linear time trend but did not find any significant linear temporal changes in anxiety ($\gamma = .01, p = .99$), social media fatigue ($\gamma = .001, p = .99$), and work engagement ($\gamma = .01, p = .99$).

4.2. Testing of day-level hypotheses

This study used confirmatory factor analyses (CFA) to verify the discriminant validity of the scale measures (Muthén and Muthén, 2012). The CFA was performed by using Mplus 7.3. The six-factor assessment model gave the data a satisfactory fit ($\chi^2 = 1149.47, df = 419, RMSEA = .05, CFI = .90, TLI = .91, SRMR_{within} = .05, SRMR_{between} = .06$). To reduce the issues of reliabilities and common method bias (Khan et al., 2020; Khan and Khan, 2019), this study compared the six factor model with the five factors model ($\chi^2 = 1899.21, df = 422, RMSEA = .08, CFI = .82, TLI = .81$) and found six factors model fit the data well as all the values were according to acceptable range (Bahadur et al., 2020; Khan and Ali, 2018; Khan, Khan, et al., 2019). An MSEM with a Bayesian estimation technique was then carried out (Hu et al., 2020; Kim et al., 2018). The Bayesian approach demonstrates benefits over traditional analysis. It enables more explicit explanations of results based on the data collected, calculates more composite models correctly, and produces confidence intervals (CIs) to reliably measure the conditional indirect effects that are not normally distributed. In this person-mean centered approach was applied to the measures of perceived COVID-19 threat and social media misinformation, and grand-mean centered to the person-level moderator of resilience (Preacher et al., 2010). All day-level variables were also person-mean-centered. This study described the effects of outcome variable on the mediators with random slopes and other effects with fixed slopes.

4.3. Hypotheses related day level relationships

Table 2 and figure 2 showed that social media misinformation ($\gamma = .35, p < .001$), and perceived COVID-19 threat ($\gamma = .41, p < .001$) was positively related to anxiety along with social media fatigue ($\gamma = .11, p < .05; \gamma = .42, p < .001$) respectively, stating that H1a-H4a all hypotheses at day level relationships were accepted. Moreover, anxiety ($\gamma = -.32, p < .001$) and social media fatigue ($\gamma = -.10, p < .05$) were negatively related to work engagement which supported H1b and H2b

Table 1 Descriptive statistics and correlation matrix

Level 1 Constructs	Mean	SD	1	2	3	4	5	6	7	8	9
1. Social Media Misinformation	3.25	1.34									
2. Perceived COVID-19 Threat	3.042	1.12	.56***								
3. Anxiety	3.29	1.15	.57***	.61***							
4. Social Media Fatigue	3.03	1.26	.32**	.48***	.42***						
5. Work Engagement	2.75	1.06	-.57***	-.58***	-.62***	-.40***					
Level 2 Variables (Person Level)											
6. Resilience	2.42	1.03	-.32**	-.42***	-.35***	-.33***	.46***				
7. Age	37.20	7.66	.28**	.29**	.18*	.21**	-.27**	-.19*			
8. Gender	0.52	0.50	.11*	.08	.22*	-.01	-.18*	-.17*	.19*		
9. Experience	5.26	1.80	.09	.13*	.08	.05	-.10*	-.01	.05	.10*	

Note: (1) Level 1 N = 412, Level 2 N = 56 (listwise); (2) age and experience are in years (3) *p < .05, **p < .01, ***p < .001.

Table 2 Multilevel Path Analysis Results

Estimates ^a	S.E.	LLCI	ULCI
Level 1: Day level			
Social Media Misinformation → Anxiety (H1a)	.35***	.043	.277 .419
Anxiety → Work Engagement (H1b)	-.32***	.047	-.398 -.243
Social Media Misinformation → Anxiety → Work Engagement (H1c)	-.25***	.040	-.335 -.178
Social Media Misinformation → Social Media Fatigue (H2a)	.11*	.052	.026 .199
Social Media Fatigue → Work Engagement (H2b)	-.10*	.041	-.153 -.019
Social Media Misinformation → Social Media Fatigue → Work Engagement (H2c)	-.08*	.020	-.121 -.044
Perceived COVID-19 Threat → Anxiety (H3a)	.41***	.043	.336 .476
Perceived COVID-19 Threat → Anxiety → Work Engagement (H3b)	-.26***	.037	-.335 -.191
Perceived COVID-19 Threat → Social Media Fatigue (H4a)	.42***	.050	.330 .493
Perceived COVID-19 Threat → Social Media Fatigue → Work Engagement (H4b)	-.07*	.028	-.133 -.022
Level 2: Cross-level Moderating effects			
Resilience → Work Engagement	.30***	.042	.323 .487
Resilience x Anxiety → Work Engagement (H5a)	.18**	.032	.150 .275
Resilience x Social Media Fatigue → Work Engagement (H5b)	-.05	.036	-.119 .022

Note: N = 412 at the day level, N = 56 at the person level. LLCI = lower level of the 95% confidence interval;

ULCI = upper level of the 95% confidence interval; a= Standardized estimates are reported. *p < 0.05, **p < 0.01, ***p < 0.001.

hypotheses. The indirect effect of social media misinformation on work engagement through anxiety {indirect impact = -.25, 95% CI = (-.335, -.178)}, and social media fatigue were significant {indirect impact = -.08, 95% CI = (-.121, -.044)}, and thus, hypotheses H1c and H2c were supported. Similarly, indirect effect of perceived COVID-19 threat on work engagement through anxiety {indirect impact = -.26, 95% CI = (-.335, -.191)}, and social media fatigue were also significant {indirect impact = -.07, 95% CI = (-.133, -.022)}, and hence, supporting hypotheses H3b and H4b.

4.5. Hypotheses related to person-level relationships

As shown in Table 2, the cross-level interaction of anxiety and resilience ($\gamma = .18, p < .01$) was positively linked to work engagement. Figure 3 showed that when resilience was higher ($\gamma = -.14, p > .05$), the relationship between anxiety and work engagement was less negative (become insignificant) than when it was lower ($\gamma = -.50, p < .05$). Results further showed that the indirect relationship of social media misinformation with work engagement via anxiety was less negative (estimated: -.06; 95% CI = -.137, .011), when resilience was higher (become insignificant) than when it was lower (estimated: -.27; 95% CI = -.351, -.193), supporting Hypotheses H5a and H5c. Furthermore, results also

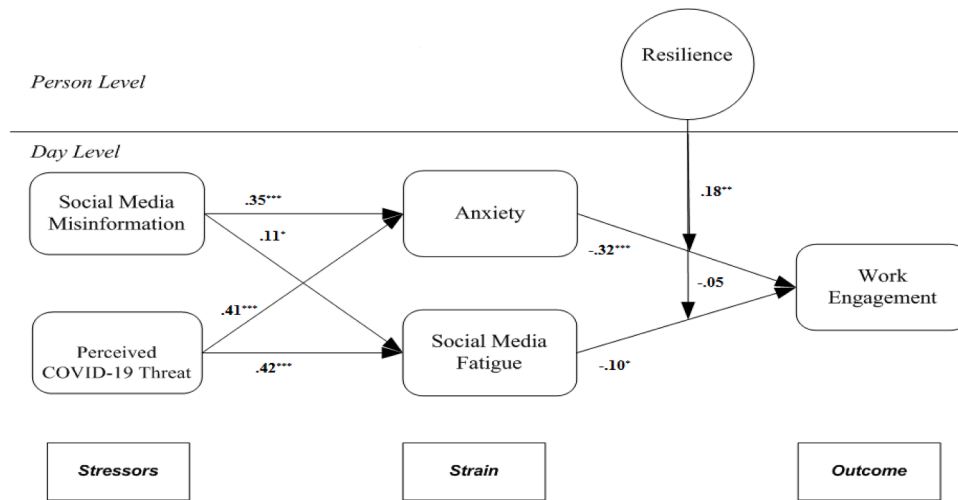


Fig. 2. Results of Path analysis; *p <0.05, **p <0.01, ***p <0.001

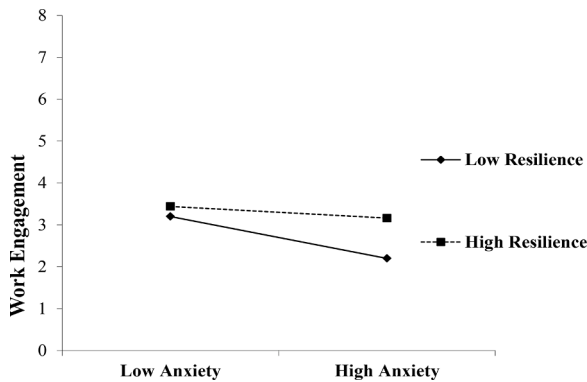


Fig. 3. Cross-level interaction effects of resilience.

indicated that the indirect relationship of social media misinformation with work engagement via social media fatigue with resilience (estimated: .01; 95% CI = -.022, .038) was not significant as zero lies between CIs rejecting H5d. Similarly, the cross-level interaction of social media fatigue and resilience ($\gamma = -.05, p > .05$) was not significantly related to work engagement and indirect effects of perceived COVID-19 threat on work engagement through social media fatigue with resilience was also not significant (estimated: .00; 95% CI = -.052, .050), therefore, rejecting H5b and H5f. On the other hand, the indirect association between perceived COVID-19 threat with work engagement via anxiety was less negative (estimated: -.06; 95% CI = -.172, .027), when resilience was higher (become insignificant) than when it was lower (estimated: -.35; 95% CI = -.441, -.265), thus H5e was also supported.

5. General Discussion

The researcher conducted a daily diary study on WFH individuals in the context of COVID-19 and found support for most of hypotheses. The findings of this study revealed that social media misinformation and perceived COVID-19 threat triggered anxiety and social media fatigue among the WFH teachers. This study applied the SSO framework to understand teacher’s psychological and work-related responses in the face of perceived COVID-19 threat and social media misinformation. The findings shows that stressors (social media misinformation and perceived COVID-19 threat) causes anxiety and induce social media fatigue when encountering an unprecedented crisis such as COVID-19. These results are consistent with crises management research findings that produce unpleasant anxiety and fatigue only when individuals are

aware of the unavoidable consequence (Hu et al., 2020; Islam et al., 2020).

This study also contributed to COVID-19 and social media misinformation research by identifying the role of resilience in translating anxiety originating from social media misinformation and perceived COVID-19 threat to work engagement. Resilience as a personality trait help individuals to cope with adverse impacts of the environment (stressors) on psychological (anxiety and social media fatigue as psychological strain) and work-related (work engagement) outcomes (Connor and Davidson, 2003; Parker et al., 2015). This study found that resilience as a personal resource helped teachers stay engaged with their work with fewer adverse impacts of social media misinformation, perceived COVID-19 threat, and anxiety when they are at a high level of resilience. A recent study showed similar findings in the COVID-19 context, where they applied leadership as a helping mechanism to minimize the dangerous effects of anxiety on job engagement and pro-social behavior (Hu et al., 2020).

The results of this study also have prompt, practical implications. First, institutions should intervene to help workers respond better to the epidemic and mitigate the detrimental effects on their mental and emotional behaviors. Second, institutions and policymakers should develop a more balanced view of the significance of the anxiety and fatigue of the workforce in influencing their efforts at work from home. Specifically, organizations should arrange online training programs for WFH employees and by utilizing the services of psychologists, try to improve the level of resilience among those employees. They should be guided that no matter how adverse the situation is they must keep themselves calm, be optimistic, develop strong personal connections, and be focused on their works. For instance, by spending more time communicating with their colleagues even though they are physically distant, individuals may take up the challenge and take support from the fellows to better transit to working remotely. Finally, in curbing COVID-19 misinformation, social media platforms have a significant role to play. WhatsApp has implemented limitations on forwarding messages containing information related to COVID-19, while Google guides reliable websites to people looking for information pertaining to COVID-19. The results of current study indicate that if social media platforms limit the amount of information to which COVID-19 threat can influence individuals, this will be beneficial in curtailing misinformation and psychological problems.

This study is subject to certain constraints, which point to future avenues for research. COVID-19 impacts our lives and livelihoods in a far-reaching way. In the post-crisis setting, it is difficult to measure the adaptation of workers, but it will be a major extension of crisis response research to examine how employees develop resilience during and after

the crisis (Hu et al., 2020). Second, current research concentrate on work engagement to assess the involvement of workers in their job duties during COVID-19 from their homes. Still, other outcomes such as job satisfaction, performance, and commitment also require attention (Chadee et al., 2021). Concerning data gathering, during the COVID-19 pandemic, the researcher collected cross-sectional responses from teachers from Pakistani government schools. Although the researcher ensured the validity and reliability of the results, the findings can be influenced by some geographical, cultural, and contextual specificity. Finally, other research has recently indicated that leadership (e.g., servant leadership) can influence the relationship between anxiety and work engagement (Hu et al., 2020). Therefore, future studies may find it fruitful to analyze different organizational factors, specifically other leadership styles, as possible moderators in the relationship between anxiety and social media fatigue on work-related outcome variables.

Conflict of Interest and Compliance with Ethical Standards

Author of this study declare that he has no conflict of interest. Moreover, this study includes only human participants; therefore, informed consent was obtained from all individual participants. All procedures performed in studies involving human participants followed the ethical standards of the institutional and/or national research committee and the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Data for this study can be attained on the request from the corresponding author.

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