Investigating the Impacts of Information Overload on Psychological Well-being of Healthcare Professionals: Role of COVID-19 Stressor

Wei Li, PhD1,2 and Ali Nawaz Khan, PhD1

Abstract
While past research has focused on the benefits of social media during pandemics, this study emphasizes the possible negative effects of social media use among healthcare professionals. It has been stated that healthcare professionals are exposed to COVID-19 and its impacts on the mental health of these workers. Even though recognizing the importance of healthcare professionals during the pandemic, the impacts of COVID-19 on the mental health of healthcare professionals have been rarely considered for investigation by researchers. By applying differential susceptibility to the media effects model (DSMM), the current article investigated the effect of COVID-19 information overload (CIO) on psychological and mental well-being and underline mechanisms. Time-wave technique was applied to collect the data. This study tested moderated mediation model by collecting data from 314 healthcare professionals. The findings stated that COVID-19 information overload impacted COVID-19 fatalism and COVID-19 exhaustion directly. Likewise, COVID-19 fatalism mediated the association between CIO and COVID-19 exhaustion. Moreover, the COVID-19 stressor moderated this mediating relationship. This study proposes several practical recommendations for healthcare professionals, social media platform providers, health authorities, organizations, and institutions on how to use social media effectively and sustainably during the global COVID-19 epidemic.

Keywords
pandemics, social media, delivery of health care, COVID-19 information overload, fatalism, COVID-19 exhaustion, COVID-19 stressor, mental health, healthcare professionals

What do we already know about this topic?
Social media use has both negative and positive impacts on its user during the pandemic

How does your research contribute to the field?
This paper investigated the effect of COVID-19 information overload on psychological and mental well-being and underline mechanisms in healthcare professionals which is still an under-explored area.

What are your research's implications toward theory, practice, or policy?
First, the role of the CIO on social media demonstrated in this study suggests that in the face of a wide range of health information and increased information sharing during COVID-19, health policymakers should guide healthcare professionals to focus on some preferred and credible social media outlets and make more meaningful relationships with online colleagues for a fruitful conversation. Second, it is advantageous for SM users, in this case, healthcare professionals, to comprehend the effects of SM (mis) use on their mental health.

Introduction
Several countries implemented lockdown measures to combat the transmission of coronavirus (COVID-19). Throughout this period, social media (SM) thus become a primary source of pandemic information.1,3 It was discovered that using SM during the global epidemic isolation had the potential to affect people’s psychological well-being, mainly among healthcare professionals.4,6 Although there are substantial advantages to using social media,7-9 particularly during an epidemic lockdown,10,11 scholarships also demonstrated the dark side of SM and figure out that the negative influences of using social media during these isolation times are understudied.1,12,13 Current research examines the impact of COVID-19 information overload (CIO) on healthcare professional SM users’ mental health and fatalism during the COVID-19-caused
isolation in the context of this distinctive background. Moreover, this study applied differential susceptibility to the media effects model (DSMM) to investigate our research model. Valkenburg and Peter established the DSMM to help us better understand media effects. Short and long-term variations in a person’s emotion, attitudes, consciousness, physiology, behaviors, and perceptions as a result of media use are known as media effects. The DSMM is a model that focuses on contextual media effects or effects on a single media user, and it builds on past theories. Thus this framework is most relevant according to our proposed research model.

**COI on Social Media and Healthcare Professionals' Health and Well-being**

The coronavirus outbreak was confirmed a pandemic by the WHO, and the virus’s spread has become a global public health emergency. The emergence of COVID-19 dubbed a “black swan event,” has wreaked havoc on people’s lives in every way. Healthcare professionals, in particular, are confronted with unique challenges. COVID-19 is widely regarded as a watershed event that will shape how members of the healthcare industry navigate the world and shape the future they will create. More notably, recent findings suggest that COVID-19 has had an important influence on the psychological well-being and mental health of healthcare professionals. Those healthcare professionals who are engaged with social media during COVID-19 are more exposed to psychological problems. During the pandemic, there was a noticeable increase in social media engagement among healthcare professionals. Many of these professionals have become increasingly dependent on online media to keep up with changing best practices and to effectively disseminate new information about the novel coronavirus. Groups on Facebook, for example, have millions of participants globally, all distributing relative information and updates, as professionals seek specialized SM groups as a way of sharing professional advice to enquires in real-time. Consequently, bulk distribution of information via SM may induce social media base COVID-19 information overload.

Earlier researches have highlighted the negative aspects of SM use and called for further scholarly research in this area. Limited research has been done on the effects of increasing SM use and growing epidemic information on SM during the epidemic lockdown. In the last few decades, SM has experienced extraordinary development in terms of usage and diffusion, reshaping people’s information consumption behavior. Throughout emergencies, SM has also become the primary source of information. According to recent findings, the massive amount of COVID-19 information produced on SM has overloaded users and this information overload had a serious influence on their psychological well-being. As a result, COVID-19 is both a global epidemic and an “info-pandemic.” Healthcare professionals tend to experience a greater than normal level of information overload. Information overload is described as a condition in which there is so much pertinent and potentially effective information available that it becomes a burden rather than a benefit. When a user’s information processing capacity is exceeded by the amount of information available, this is referred to as “information overload.” Over the last few months, the growing levels of relevant health information, particularly through online sources, have exacerbated the problem of health information overload. Thus COI can be defined as the volume of the information about COVID-19 which is prevalent on SM and is beyond the capacity of the user to process it. This kind of overload has serious impacts on users’ psychological health. However, the influence of the COI on social media and its influence on healthcare professionals are still unknown. Thus, the first purpose of this study is to discover the effects of the COI on social media on the mental health (COVID-19 exhaustion in this case) of healthcare professionals.

**CIO on Social Media, Fatalism, COVID-19 Exhaustion**

Fatalism refers to the perception that one’s actions have little or no effect on various consequences. Fatalistic people do not engage in future-oriented planning, put little effort into achieving desired objectives, and are usually designed to fate. In other words, they are ready to surrender to external factors. Even though the temptation to exhibit fatalism is an individual characteristic, some situations will foster fatalistic thinking regardless of personal characteristics. Fatalism may be especially prevalent during the COVID-19 pandemic. Social media is the key influencer of fatalism, individuals usually seek health-related information on social media. COVID-19 information is extensively available via social media, allowing users to use this information. Users are overwhelmed by information overload, which leads to stress and negative emotional states. As a result of the widespread use of SM, information overload has been viewed as a consequence of the information era. COVID-19 in our research setting as a significant occurrence has led to the headlines through the media. In the meantime, during the lockdown, SM was used to distribute a lot of information...
about COVID-19 as an important origin of epidemic news and updates.\textsuperscript{2,42} During these times healthcare professionals extensively use social media for updating their current knowledge about the virus,\textsuperscript{4,43,44} which may have resulted in an overabundance of information and prompted adverse psychological states\textsuperscript{13,25,45,46} and exposure to this information on media can lead to fatalism.\textsuperscript{47}

According to previous research, fatalism is linked to negative health outcomes.\textsuperscript{48} Fatalism evokes a sense of inevitability about predetermined outcomes, which lowers coping desire. Fatalism diminishes the range of resources that can be used to deal with difficult situations and rises the feeling of being overwhelmed by emotional burdens because it shrinks the range of resources that can be used.\textsuperscript{49} Fatalism also has a strong link to psychological avoidance. People who are fatalistic comply with their predetermined fate and avoid activities that contradict what they think is unavoidable.\textsuperscript{47} Jimenez et al\textsuperscript{50} discovered that fatalistic beliefs led to the prevention of advised prevention strategies in the COVID-19 pandemic, amplifying COVID-19-related fear and stress. This is especially for healthcare professionals who are overburdened with information about the fatality of COVID-19 which can lead them to be emotionally drained.

Emotional exhaustion is a condition in which you feel emotionally exhausted and depleted as a consequence of the increased stress from your personal or professional lives or a mixture of both.\textsuperscript{51-53} COVID-19 exhaustion, on the other hand, refers to feelings of mental exhaustion that happen as a consequence of the pandemic.\textsuperscript{54} Although the impact of fatalism on exhaustion has rarely been studied, previous research suggests a connection between fatalism and decreased well-being in individuals.\textsuperscript{37,50} Fatalism, according to Roberts et al,\textsuperscript{55} leads to increased pessimism, low self, and more passive coping in people. Likewise, fatalistic individuals planned more suicides, were more impulsive, and had more accepting mindsets toward suicide.\textsuperscript{56} Recently, a study by Ngien and Jiang\textsuperscript{57} found the impact of fatalism on the stress level of youth. They found that fatalism mediated the association between social media and stress which was moderated by emotional exhaustion. Another study examined the relationship between fatalism due to COVID-19 and its impacts on mental health.\textsuperscript{37} As a result, our investigation of healthcare professionals' experiences in the context of CIO on social media—fatalism and exhaustion—is consistent with previous research and represents an important extension of previous work, which was the second objective of the current study.

The Current Study

The theoretical base for the current study is the Differential Susceptibility to Media Effects Model.\textsuperscript{14} This is a well-known integrative model that looks at the links between media consumption and health outcomes. The DSMM claims that media consumption has an impact on users' mental, psychological, emotional, and behavioral responses. The course and power of media exposure effects are moderated by certain personal or social factors. Several factors, including previous and present stress, as well as previous general health, could act as moderators.\textsuperscript{57} As such, the link between media exposure and concern about the Ebola virus was strengthened in people who had experienced more stressful reactions to a previous bombing.\textsuperscript{58} Respondents with prior psychological health problems were more sensitive to the coverage of media as major disasters and stated additional stress in another study.\textsuperscript{59} Still, in the current pandemic, conditional effects, for example, the moderating role of COVID-19 stressor in the association between CIO on social media and fatalism, have not been investigated.

By applying DSMM, a recent study tested the moderating effects of COVID-19 stressor on the association between media use and psychological well-being outcomes. The study found significant moderating effects of COVID-19 stressor on the link between social media use and depression.\textsuperscript{60} Therefore, in this study, we added COVID-19 stressor as a potential moderator in the association between CIO on social media and fatalism. Based on the DSMM framework and prior findings we expect that the COVID-19 stressor will act as a significant moderator in our context as well. Moreover, past studies have also investigated mediating effects of different variables in the link between SM exposure and psychological health well-being in the DSMM. Silver et al (2013) found that acute stress is not a significant mediator between media exposure and physical health in longitudinal studies, while Holman et al (2019) discovered that panic of future terrorism was a significant mediator in the association between media usage and functional injury in longitudinal studies. Even though understudied, there is some indication that fatalism may mediate the influences of CIO on social media on COVID-19 exhaustion.

Therefore, another important goal of this study is to see if and how exposure to CIO is linked to psychological health outcomes in a group of healthcare professionals. The current study looked at the links between CIO on social media, the COVID-19 stressor, COVID-19 fatalism, and psychological health, that is, COVID-19 exhaustion. This study developed the following hypotheses based on the rationality of the DSMM and evidence-based findings on social media use:

Hypothesis 1: COVID-19 information overload on social media will be positively related to COVID-19 fatalism. (b) COVID-19 exhaustion

Hypothesis 2: COVID-19 fatalism will moderate the link between COVID-19 information overload on social media and COVID-19 exhaustion.

Hypothesis 3: The COVID-19 stressor will moderate the link between COVID-19 information overload and COVID-19 fatalism and this relationship will be stronger for individuals reporting a high level of COVID-19 stressor as compared to low.

Hypothesis 4: The COVID-19 stressor will moderate the links in Hypothesis 2 in a way this mediating relationship will be more stronger for the individuals reporting a high level of COVID-19 stressor as compared to low.
Research Methodology

Data for this study were collected online in 3 waves. The purposive sampling technique was used to request participants to partake in the scholarship. We recruited healthcare professionals (ie, medical doctors, nurses, and other healthcare employees) from any hospital/clinical facility in Pakistan for this online survey. The ethical approval (Ref no. JH-202214) from the concerned insinuation’s ethical committee was taken. Healthcare professionals who participated in our analysis did not have to be in contact with COVID-19 patients. The survey was circulated to healthcare professionals via mailing lists, WhatsApp, and all SM platforms (ie, Facebook, Instagram, and LinkedIn). Respondents were requested to distribute the survey to their contacts to reach a larger number of Pakistani healthcare professionals. The English survey contains 2 parts, including demographic and study variables. Respondents were insured about the anonymity of their responses and informed consent was also obtained before collecting final responses. Moreover, respondents were informed about voluntary participation in the study and they can quit the survey at any stage of the data collection.

In August 2020 initial surveys were sent to 600 professionals. Due to the number of factors involved, less than 200 respondents were necessary for the sample size. As data were collected from single sources, therefore, social desirability and common method bias (CMB) can be the potential threat to the data. Thus, to avoid these threats and improve confidence in the results of this study, the data were collected in 3 waves. In the first wave, data about demographics, CIO on social media, and COVID-19 stressor were collected. Out of 600 surveys, this study received 486 useable responses in the first wave. After 2 months of the first wave, the researcher again conducted with those 486 respondents and sent surveys about COVID-19 fatalism. In the second wave, this study received 402 final responses. Finally, at time 3, after 2 month time period of wave 2, these professionals were again contacted for the data collection about COVID-19 exhaustion. In this wave, this study received 314 (final response rate = 52.3%) useable responses. Demographic variables and the use of social media-related questions were asked in the first wave. Participants were asked to answer the statements related to their social media use (except during the professional commitments) and their social media using experience.

Rendering to demographic details (see Table 1), most of the participants’ average age range was in between 21 and 30 years (36.9%), and 65% of them were female. Of the sample, 50.6% specified they used social media almost all of the time during COVID-19 and 35% stated that they used social media frequently. In the sample, most of the participants were medical doctors 46.2% followed by nursing staff 33.8%. The majority of participants (54.5%) had more than 6 years of social media experience, whereas only 9.9% had less than 1 year of social media using experience.

Table 1. Details About Demographic Variables and Social Media Use.

| Variables              | N   | Percentage |
|------------------------|-----|------------|
| Gender                 |     |            |
| Male                   | 110 | 65.0       |
| Female                 | 204 | 35.0       |
| Age                    |     |            |
| Up to 20               | 17  | 05.4       |
| Between 21 and 30      | 116 | 36.9       |
| Between 31 and 40      | 96  | 30.6       |
| Between 41 and 50      | 65  | 20.7       |
| Above 50               | 20  | 06.4       |
| Job role               |     |            |
| Medical doctors        | 145 | 46.2       |
| Nurses                 | 106 | 33.7       |
| Other staff            | 63  | 20.1       |
| Experience of social media |   |            |
| Upto-1 year            | 31  | 09.9       |
| 1-3 years              | 51  | 16.2       |
| 3-5 years              | 61  | 19.4       |
| 5-7 years              | 171 | 54.5       |
| Social media during COVID |   |            |
| Rarely                 | 08  | 02.6       |
| Occasionally           | 19  | 06.1       |
| Sometimes              | 18  | 05.7       |
| Frequently             | 110 | 35.0       |
| Almost all of the time | 159 | 50.6       |

Measurement

The items utilized in this study were adapted from previous research and adjusted to fit the study context. The responses were rated on a 5-point Likert scale, with 1 indicating strong disagreement and 5 indicating strong agreement with statements. Three items for measuring COVID-19 information overload were obtained from the past studies. A sample item was (α = .80) “cannot handle all the COVID-19-related information on social media effectively.” To measure fatalism 5 items were taken from a past study. One of the sample items was (α = .83) “during COVID-19 I believe that my health is determined by something greater than myself.” To measure COVID-19 exhaustion items were drawn from past studies. From the 4-item scale, a sample item was (α = .81) “as a result of COVID-19, I feel emotionally drained.” Finally, COVID-19 stressors were assessed using a 10-item checklist tool taken from the measure of SARS-related stressors. Respondents were asked if they had watched or encountered the lockdown, had confirmed or alleged infection, lost family members, worked with infected patients, did volunteer work in pandemic prevention and management, and lacked basic needs like food, face masks, sanitizers, and medical treatment. Each item received a “yes” (coded as 1) or “no” (coded as 0) response. All of the items’ scores were added together to create COVID-19 stressor indexes during the epidemic. The scale ranges from 0 to 10, with a higher score reflecting a higher risk of a pandemic.
Statistical Analysis

We used SPSS-24 for explanatory factor analysis (EFA) and Mplus-24 for confirmatory factor analysis (CFA) and structural equation modeling (SEM) in the current research to assess both, the measurement model and structural model.

Measurement Model

EFA was used to validate the underpinning factor structure. The EFA results with maximum likelihood extraction and Promax rotation yielded a 3-factor solution. The item loadings for each measurement are shown in Table 2. The EFA results show that the factor loadings are above the threshold, ranging between 0.644 and 0.789. CFA with 3 latent factors was used to assess the composite reliability (CR), convergent, and discriminant validity of every construct, including the measurement model’s goodness-of-fit. The goodness-of-fit metrics were acceptable: the CFI (0.962) and TLI (0.951) values were both higher than 0.90; the RMSEA (0.055) value was less than 0.10, suggesting that the measurement model fits the data well. Alphas for every variable vary from .80 to .83, and CRs vary from 0.79 to 0.83, both of which were greater than the least accepted values of 0.7, approving their satisfactory level of reliability, convergent validity, and internal consistency.

The statistical significance of the standardized factor loadings was greater than 0.5 (the significant proportion was larger than 0.7). Besides, the average variance extracted (AVE) for each of the individual constructs was greater than 0.5 (see Table 2), indicating convergent validity. Furthermore, the square root of the AVE of the latent variables was larger than the correlations between them, and the correlation between these measures was less than .80 (see Table 3), indicating that they were discriminately valid. The variance inflation factor for every variable was less than the recommended cutoff of 10, indicating that multicollinearity does not exist. This study further tested Harman’s single factor test for CMB threat. Findings state the first factor explaining only 35.4% of variance which was in the acceptable range stating no issue of CMB in the data.

Table 2. Factors Loadings, Alpha, Composite Reliability and AVE.

| Constructs                      | Items | Loadings | CR  | Cronbach’s alpha | AVE |
|--------------------------------|-------|----------|-----|------------------|-----|
| COVID-19 Fatalism (FAT)        | FAT1  | 0.674    | 0.83| .83              | 0.50|
|                                | FAT2  | 0.675    |     |                  |     |
|                                | FAT3  | 0.730    |     |                  |     |
|                                | FAT4  | 0.644    |     |                  |     |
|                                | FAT5  | 0.789    |     |                  |     |
| COVID-19 Exhaustion (EXH)      | EXH1  | 0.747    | 0.80| .81              | 0.51|
|                                | EXH2  | 0.666    |     |                  |     |
|                                | EXH3  | 0.708    |     |                  |     |
|                                | EXH4  | 0.724    |     |                  |     |
| COVID-19 Information Overload on Social Media (CIO) | CIO1 | 0.726 | 0.79 | .80 | 0.55 |
|                                | CIO2  | 0.731    |     |                  |     |
|                                | CIO3  | 0.773    |     |                  |     |

Note. All factor loadings are significant at the P < .001 level. CR = composite reliability; AVE = average variance extracted.

Structural Model

Table 3 displays the study constructs’ means, standard deviations, and correlations, including the square root of the AVE. We tested the structural model with data in 2 steps. Initially, we tested the direct and indirect paths using Mplus-24 and a bootstrapping technique. The suggested model’s general fit indices were satisfactory because the values were within the widely recognized ranges: CFI = 0.938, TLI = 0.921, and RMSEA = 0.062. The path coefficient was then computed in the second step (see Figure 1).

Results

As revealed in Figure 1, participants’ CIO on social media use was positively associated with their COVID-19 fatalism ($\beta = .39, P < .001$) accepting hypothesis 1a. The results imply individuals who scored high at CIO on social media tended to experience more COVID-19 fatalism. Similarly, CIO on social media was a significant predictor of COVID-19 exhaustion ($\beta = .35, P < .001$) accepting hypothesis 1b as well. This means that healthcare professionals who experienced greater CIO on social media reported more COVID-19 exhaustion. Moreover, COVID-19 fatalism was positively linked with COVID-19 exhaustion ($\beta = .29, P < .001$). Furthermore, a bootstrapping test was used to test the mediating hypothesis. The results from bootstrapping disclosed that the CIO on social media was indirectly related to COVID-19 exhaustion via COVID-19 fatalism, with standardized indirect effects of 0.07 (95% CI= [0.03, 0.14]), stating that hypothesis 2 was also accepted.
For testing hypothesis 3 a multiplicative term between CIO on social media and COVID-19 stressor was computed. The interactive term was added in the path analysis. The result in Figure 1 states that it was significant ($\beta = .20$, $P < .01$), therefore, accepting hypothesis 3 as well. The finding of this effect was further drawn in Figure 2. Figure 2 stated that the relationship between CIO on social media and the COVID-19 fatalism was stronger when the COVID-19 stressor was higher ($\beta = .59$, $P < .001$), and was weaker when the stressor was weaker ($\beta = .19$, $P < .05$).

Moreover, following the lead of recent research,73,74 we put our moderated mediation model to the test using the PROCESS macro.75 We used this tool to avoid the theoretical and statistical limitations that come with conventional methods of testing mediation and moderation. The tool employs a bootstrap test, which is assumed to be better than the traditional techniques because bootstrapping-based confidence intervals account for non-normality in the distribution of mediated effects.76 Moreover, bootstrapping produces an observational approximation of a statistic’s sampling distribution with the substitute from the original information, but evaluates the effect from the impactful resultant data. This method generates both direct effects of the independent variable on the dependent variable and indirect effects, which are the magnitude differences between these variables transmitted via mediating variable. We received support for our moderated mediation model, which was uniform with the regression analysis. The bootstrapping results at 5000 repetitions prove that the indirect effect of COVID-19 information overload on COVID-19 exhaustion via COVID-19 fatalism is statistically significant at the mean ($\beta = .05$, 95% confidence level [0.02, 0.10]), at $+1SD$ ($\beta = .09$, 95% confidence level [0.02, 0.16]), but insignificant at $-1SD$ ($\beta = .02$, 95% confidence level [−0.01, 0.06]), of COVID-19 stressor. This proved the hypothesis 4 of this study as well.

**Discussion**

Even though the widespread use of social media by healthcare professionals, research on the direct effects of social media on their mental health has yielded mixed results. During the COVID-19 pandemic in Pakistan, the current study provided new insights by empirically examining a moderated mediation pathway connecting CIO on social media to COVID-19 exhaustion among healthcare professionals.

The findings of the current study indicated that CIO on social media enhances the COVID-19 fatalism, which is inconsistent with previous research that has found that social media has a positive influence on dealing with health-related

| Constructs                  | Mean | SD  | 1    | 2  | 3    | 4    |
|-----------------------------|------|-----|------|----|------|------|
| 1.CCOVID-19 stressor        | 4.17 | 1.74| -    |   |      |      |
| 2.COVID-19 information overload on social media | 3.55 | 1.16| 0.10*| (0.74) |
| 3.COVID-19 fatalism         | 3.35 | 0.84| 0.19**| 0.27*** | (0.70) |
| 4.COVID-19 exhaustion       | 3.47 | 0.79| 0.11*| 0.35*** | 0.34*** | (0.71) |

Note. (1) Correlation is significant at the ***$P < .001$, **$P < .01$, *$P < .05$; (2) Square roots of AVE for every constructs is shown in parentheses, (3) $n = 314$. 

![Figure 1. Result of the path analysis.](image-url)

$***P < .001$. $**P < .01$. $*P < .05$. 

Table 3. Descriptive Statistics, Square Root of AVE and Correlation Matrix.
The possible reason for this contradictory reason can be that these studies investigated the positive side of social media use, however, by considering information overload during COVID-19 on social media this study investigated the negative side of social media on its users. Healthcare professionals use social media during a pandemic for gaining new knowledge about the virus, however, due to excessive and fake information prevailing on social media one can be caught in the condition which is known as information overload which creates uncertainty about the virus and this uncertainty can lead toward mental health problems and fatalism.

This study also found that CIO on social media has a positive and direct relationship with COVID-19 exhaustion as well as indirect effects through COVID-19 fatalism and fatalism is positively related to COVID-19 exhaustion. These findings are consistent with previous studies that have linked social media information to poor mental health and fatalism to poor mental health during COVID-19. Fatalism, which is linked to a belief in the efficacy of divine or spiritual forces rather than individual forces in influencing life outcomes, causes a sense of future unpredictability, which raises COVID-19 exhaustion. Roseman et al. proposed that events with low control potential (eg, CIO on social media) produce adverse (ie, COVID-19 fatalism) feelings like depression or stress rather than reactive (ie, rigidity to avoidant conditions) feelings like motivation to combat COVID-19 exhaustion. This is especially true for healthcare professionals, which were overburdened with the CIO on social media due to a lack of resources to combat this threat.

Another key finding pertains to the moderating role of the COVID-19 stressor. Disaster-related stressors, in addition to media exposure, have been identified as one of the most important factors of mental health. The COVID-19 stressor is considered a common stressor that healthcare professionals in the current study experienced during the COVID-19. A greater COVID-19 stressor level is linked to an increased level of COVID-19 fatalism. Prior research has found that people who have been exposed to more COVID-19 stressors are more likely to develop anxiety disorders and depression. Furthermore, CIO on social media was linked to COVID-19 fatalism at the different levels of COVID-19 stressor. It appears that healthcare professionals who were exposed to a higher level of stress were more susceptible to COVID-19 fatalism.

Finally, an important finding of the current study is the acceptance of the moderated-mediation-related hypothesis. Results show that the indirect effect of the CIO on social media on COVID-19 exhaustion via COVID-19 fatalism at the different levels of the COVID-19 stressor was stronger, especially; this relationship was stronger at the high level of the COVID-19 stressor. Even though there is no prior empirical evidence that can be compared with this finding, this result suggests that healthcare professionals who were
exposed to information overload on social media during COVID-19 and more vulnerable to COVID-19 exhaustion and fatalism in the presence of COVID-19 stressor.

Theoretical Contributions

This study contributed to existing research in the following ways; first, this study extended the DSMM model by including moderating variable of COVID-19 stressor. Our model provides a more comprehensive framework by emphasizing the importance of including social factors (such as COVID-19 stressor) as moderators of the effect of COVID-19 information overload on individual wellbeing factors (i.e., fatalism). Second, to our understanding, our moderated mediation process is the first to show the impact of healthcare professionals’ social media information overload on mental health during global health crises. This investigative model could be used in future studies to look at how social media can help healthcare professionals to promote their health during the period of pandemics. Third, according to media studies, although SM became the primary source of information for some groups during the COVID-19 isolation, the influence of SM use as a medium of communication during such events is less clear.13 This research classifies the negative effects of an oversupply of epidemics information on social media from the perception of users, as well as the potential drawbacks of using social media in crises.

Finally, while some studies suggest that the global epidemic lockdown contributed to healthcare professionals’ mental distress,4,82 the psychological processes (i.e., the antecedents and consequences of these severe negative states) have not been investigated.1,13 Our research sheds new light on healthcare professionals’ psychological well-being during the lockdown as a result of social media use, demonstrating that CIO on social media affected psychological processes and, as a result, formed healthcare professionals’ social media use behavior. Particularly, we exemplify the research context and describe 2 distinct psychological trajectories by highlighting pandemic-related (i.e., COVID-19 fatalism and COVID-19 exhaustion) and information-related (i.e., COVID-19 stressor) psychological factors, in contrast to previous research that focused on generic psychological conditions deriving from information overload. This technique contributes to a better understanding of information overload on social media as a growing issue in the age of information, as well as the psychological mechanisms that frame social media users’ behavioral patterns.13

Practical Contributions

This research provided some important implications for the practice as well. First, the role of the CIO on social media demonstrated in this study suggests that in the face of a wide range of health information and increased information sharing during COVID-19, health policymakers should guide healthcare professionals to focus on some preferred and credible social media outlets and make more meaningful relationships with online colleagues for a fruitful conversation. Second, it is advantageous for SM users, in this case, healthcare professionals, to comprehend the effects of SM (mis) use on their mental health. This study recommends healthcare professionals SM users self-observe their social media information usage, self-assess psychological states connected with SM, and self-adjust their social media use, thus preserving positive SM use routines and mental well-being, particularly during disaster situations.

Third, the findings of this study can help social media platform providers to a better understanding of the reasons and psychological mechanisms underlying user disconnection from SM. This study illustrates the negative effects of CIO on social media on healthcare professionals’ psychological well-being, furthermore to the ease and suitability of SM use in the COVID-19 interaction during the epidemic. To ensure the long-term growth of social media, media companies should pay particular attention to users’ mental health associated with social media use. More notably, media companies should enable personalized SM use by creating content filtering features. Particularly, social media network companies could use machine learning techniques to determine emotionally distressed users and permit users to restrict that information fully or partially pertaining to harmful impacts to them.13,83 User empowerment and the long-term growth of social media platforms would both benefit from this type of customized service. Healthcare professional as frontline fighter against pandemic represents high influential users who can help society with their knowledge. As a result, media companies must pay close attention to healthcare professionals’ social media usage patterns and develop services to meet their needs and priorities in this area.

Fourth, fatalism was found to have an impact on emotional well-being in this research. As a result, health policymakers must work to reduce individuals’ fatalistic beliefs. Introducing a role model to increase individuals’ encouragement to cope with health issues and teaching effective self-management skills are examples of strategies that should be used. It is worth noting that more culturally relevant coaching programs are required, as fatalism is impacted by the distinct culture grounded in religious societies like Pakistan. Finally, the finding of this study suggested COVID-19 stressor as an impactful moderator which can enhance the adverse impact of information overload on fatalism and exhaustion. Legislators, healthcare organizations, psychologists, and healthcare professionals must all be aware of the possible negative effects of constant SM exposure. To mitigate negative feelings stimulated by information overload, the general public, particularly those who have been directly or indirectly traumatized by COVID-19, could be recommended to avoid extreme SM use and learn impactful coping skills (e.g., reappraisal) to avoid psychological well-being losses.
Limitations and Future Research Directions

The current study has several limitations. First, respondents were entirely recruited through SM, and those who did not use any form of SM may have been excluded from the study, potentially exposed to the sample’s representativeness. Second, to avoid the issue of social desirability and CMB, this study collected data in the time-lag format, given that in the DSMM, emotional response was classified as a state-like factor. Future studies could benefit from using other designs, for example, experience sampling studies or daily diaries studies, to record the daily variability of emotions and SM use patterns. Third, only the possible mediating role of emotional states (fatalism) was investigated in this study. Other DSMM intermediaries, including cognitive appraisal or excitatory reactions, are likely to occur and should be investigated further in future studies. Moreover, we didn’t consider the vaccination effects; future studies should continue this line of research by considering vaccination effects. Finally, because this study only collected data from Pakistan and only from healthcare professionals, its applicability to other countries and sectors may be constrained. Provided that COVID-19 is a global health emergency, more comparative research should be done, especially in communities with various health issues and healthcare systems.

Conclusions

This study investigated the impacts of COVID-19 Information Overload on COVID-19 exhaustion via COVID-19 Fatalism by using the DSMM framework. Furthermore, moderating effects of COVID-19 Stressor on the relationship between COVID-19 Information Overload and COVID-19 Fatalism were also investigated. This study found that COVID-19 Information Overload is an important influencer of fatalism and exhaustion. Moreover, the COVID-19 Stressor strengthens the positive relationship between COVID-19 Information Overload and fatalism as well as indirect effects of COVID-19 Information Overload on exhaustion through fatalism. These findings have some important implications for practice and research.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: Supported by the Key Research Base Project of Humanities and Social Sciences of Universities in Hubei Province and School of Economics and Management, Hubei Engineering University, Xiaogan, Hubei, P.R. China.

Availability of Data and Materials

Data for this study can be attained on the request from the corresponding author.

Ethical Approval

All procedures performed in studies involving human participants were following the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Ethical approval was taken from the ethical committee of participating organizations.

Permission to Reproduce Material From Other Sources

No material was taken from other sources which need permission to publish.

ORCID iD

Ali Nawaz Khan https://orcid.org/0000-0002-0191-6198

References

1. Laato S, Islam AKMN, Islam MN, Whelan E. What drives unverified information sharing and cyberchondria during the COVID-19 pandemic? Eur J Inf Syst 2020;29(3):288-305. doi:10.1080/0960085X.2020.1770632
2. Gever VC, Talabi FO, Adelabu O, Sanusi BO, Talabi JM. Modeling predictors of COVID-19 health behaviour adoption, sustenance and discontinuation among social media users in Nigeria. Telemat Informatics. 2021;60:101584. doi:10.1016/j.tele.2021.101584
3. Purewal S, Ardiles P, Di Ruggiero E, Flores JVL, Mahmood S, Elhagehassan H. Using social media as a survey recruitment strategy for post-secondary students during the COVID-19 pandemic. Inquiry 2021;58:0046958021110593. doi:10.1177/004695802111059305
4. Khan AN. Misinformation and work-related outcomes of healthcare community: sequential mediation role of COVID-19 threat and psychological distress. J Community Psychol 2021;50(2):944-964. doi:10.1002/jcop.22693
5. Hakim M, Afaq S, ALi Khattak F, et al. Perceptions of COVID-19-related risks and deaths among health care professionals during COVID-19 pandemic in Pakistan: a cross-sectional study. Inquiry. 2021;58:0046958021110674. doi:10.1177/004695802111067475
6. Cotrin P, Moura W, Gambardela-Tkacz CM, et al. Healthcare workers in Brazil during the COVID-19 pandemic: a cross-sectional online survey. Inquiry. 2020;57:57. doi:10.1177/0046958020963711
7. Cao X, Khan AN, Ali A, Khan NA. Consequences of cyberbullying and social overload while using SNSs: a study of users’ discontinuous usage behavior in SNSs. Inf Syst Front. 2020;22(6):1343-1356. doi:10.1007/s11796-019-09936-8
8. Khan AN. A Diary study of social media and performance in service sector: Transformational leadership as cross-level moderator. Curr Psychol. Published online September 18, 2021. doi:10.1007/S12144-021-02310-5
9. Kakar A, Khan AN. The impacts of economic and environmental factors on sustainable mega project development: role of community satisfaction and sustainable social media. *Environ Sci Pollut Res.* 2021;28:2753-2764. doi:10.1007/s11356-020-10661-y

10. Zeemering ES. Functional fragmentation in city hall and Twitter communication during the COVID-19 pandemic: evidence from Atlanta, San Francisco, and Washington, DC. *Gov Inf Q.* 2021;38(1):101539. doi:10.1016/j.giq.2020.101539

11. Sarangi A, Amor W, Co ELF, Javed S, Usmani S, Rashid A. Social media reinvented: can social media help tackle the post-pandemic mental health onslaught? *Cureus.* 2022;14(1):e21070. doi:10.7759/CUREUS.21070

12. Khan AN. A diary study of psychological effects of misinformation and COVID-19 threat on work engagement of workers from home employees. *Technol Forecast Soc Change.* 2021;171:120968. doi:10.1016/j.techfore.2021.120968

13. Liu H, Liu W, Yogathan V, Osburg VS. COVID-19 information overload and generation Z’s social media discon tinuance intention during the pandemic lockdown. *Technol Forecast Soc Change.* 2021;166:120600. doi:10.1016/J.TECHFORE.2021.120600

14. Valkenburg PM, Peter J. The differential susceptibility to media effects model. *J Commun.* 2013;63(2):221-243. doi:10.1111/jocom.12024

15. van Duin C, Heinz A, Willems H. Predictors of problematic social media use in a nationally representative sample of adolescents in Luxembourg. *Int J Environ Res Public Health.* 2021;18(22):11878. doi:10.3390/ijerph182211878

16. Zhong B, Huang Y, Liu Q. Mental health toll from the coronavirus: social media usage reveals Wuhan residents’ depression and secondary trauma in the COVID-19 outbreak. *Comput Human Behav.* 2021;114:106524. doi:10.1016/j.chb.2020.106524

17. Peng F, Yuan H, Wu S, Zhou Y. Recent advances on drugs and vaccines for COVID-19. *Inquiry.* 2021;58:0046958021105565. doi:10.1177/00469580211055630

18. Shehzad K, Sarfraz M, Shah SGM. The impact of COVID-19 as a necessary evil on air pollution in India during the lockdown. *Environ Pollut.* 2020;266(Pt 1):115080. doi:10.1016/j.envpol.2020.115080

19. Bozdag F, Ergün N. Psychological Resilience of healthcare professionals during COVID-19 Pandemic. *Psychol Rep.* 2021;124:2567-2586. doi:10.1177/0033294120965477

20. Law RW, Kanagasigam S, Choong KA. Sensationalist social media usage by doctors and dentists during Covid-19. *Digit Health.* 2021;7(4):435-454. doi:10.1177/20552076211028034

21. Ruiz-Frutos C, Ortega-Moreno M, Dias A, Bernardes JM, García-Iglesias JJ, Gómez-Salgado J. Information on COVID-19 and psychological distress in a sample of non-health workers during the pandemic period. *Int J Environ Res Public Health.* 2020;17:6982. doi:10.3390/ijerph17196982

22. Smith GD, Ng F, Ho Cheung Li W. COVID-19: Emerging compassion, courage and resilience in the face of misinformation and adversity. *J Clin Nurs.* 2020;29(9-10):1425-1428. doi:10.1111/jocn.15231

23. Setiawan HW, Pratiwi IN, Nimah L, et al. Challenges for healthcare workers caring for COVID-19 patients in Indonesia: a qualitative study. *Inquiry.* 2021;58:4695802111060291. doi:10.1177/004695802111060291

24. Raza MY, Khan AN, Khan NA, Ali A, Bano S. Dark side of social media and academic performance of public sector schools students: role of parental school support. *J Public Aff.* 2020;20(3):20. doi:10.1002/pa.2058

25. Yu L, Cao X, Liu Z, Wang J. Excessive social media use at work: exploring the effects of social media overload on job performance. *Inf Technol People.* 2018;31(6):1091-1112. doi:10.1108/ITP-10-2016-0237

26. Liu N, Chen Z, Bao G. Role of media coverage in mitigating COVID-19 transmission: evidence from China. *Technol Forecast Soc Change.* 2021;163:120435. doi:10.1016/j.techfore.2020.120435

27. Pentina I, Tarafdar M. From “information” to “knowing”: Exploring the role of social media in contemporary news consumption. *Comput Human Behav.* 2014;35:211-223.

28. Cao X, Khan AN, Zaigham GHK, Khan NA. The stimulators of social media fatigue among students: role of moral disengagement. *J Educ Comput Res.* 2019;57(5):1083-1107.

29. Bano S, Cisheng W, Khan AN, Khan NA. WhatsApp use and student’s psychological well-being: role of social capital and social integration. *Child Youth Serv Rev.* 2019;103(8):200-208. doi:10.1016/j.childyouth.2019.06.002

30. Abouzeid A, Granmo O-C, Webersik C, Goodwin M. Learning Automata-based misinformation mitigation via Hawkes processes. *Inf Syst Front.* 2021;23:1169-1188. doi:10.1007/s10796-020-10102-8

31. Ryerson NC. Behavioral and psychological correlates of well-being during COVID-19. *Psychol Rep.* 2022;125:200-217. doi:10.1177/0033294120978160

32. Su Y. It doesn’t take a village to fall for misinformation: social media use, discussion heterogeneity preference, worry of the virus, faith in scientists, and COVID-19-related misinformation beliefs. *Telematics Inform.* 2021;58:101547. doi:10.1016/j.tele.2020.101547

33. Yuan H, Deng W. Doctor recommendation on healthcare consultation platforms: an integrated framework of knowledge graph and deep learning. *Internet Res.* 2022;32:454-476. doi:10.1108/ir-07-2020-0379

34. Zhang S, Zhao L, Lu Y, Yang J. Do you get tired of socializing? An empirical explanation of discontinuous usage behaviour in social network services. *Inf Manag.* 2016;53(7):904-914. doi:10.1016/j.im.2016.03.006

35. Solomon RC. On fate and fatalism. *Philos East West.* 2003;53:435-454.

36. Goodwin R, Allen P, Nizharadze G, et al. Fatalism, social support, and mental health in four former Soviet cultures. *Pers Soc Psychol Bull.* 2002;28(9):1166-1171. doi:10.1177/01461672022812002

37. Hayes J, Clerk L. Fatalism in the early days of the COVID-19 pandemic: implications for mitigation and mental health. *Front Psychol.* 2021;12:560092. doi:10.3389/fpsyg.2021.560092

38. Ngien A, Jiang S. The effect of social media on stress among young adults during COVID-19 pandemic: taking into account fatalism and social media exhaustion. *Health Commun.* Published online February 18, 2021. doi:10.1080/10410236.2021.1888438

39. Gao J, Zheng P, Jia Y, et al. Mental health problems and social media exposure during COVID-19 outbreak. *PLoS One.* 2020;15(4):e0231924. doi:10.1371/journal.pone.0231924
40. Khan AN, Khan AN, Moin MF. Self-regulation and social media addiction: a multi-wave data analysis in China. Technol Soc. 2021;64:64. doi:10.1016/j.techsoc.2021.101527
41. Khan AN, Moin MF, Khan NA, Zhang C. A multistudy analysis of abusive supervision and social network service addiction on employee’s job engagement and innovative work behaviour. Creat Innov Manag. 2022;31(1):77-92. doi:10.1111/CAIM.12481
42. Nabity-Grover T, Cheung CMK, Thatcher JB. Inside out and outside in: how the COVID-19 pandemic affects self-disclosure on social media. Int J Inf Manag. 2020;55:102188. doi:10.1016/j.ijinfomgt.2020.102188
43. Bazán PR, de Azevedo Neto RM, Lacerda SS, et al. Can news with positive or negative content affect and a relaxation pause improve the emotional state of health care professionals? A randomized online experiment during COVID-19 pandemic. Internet Inter. 2021;26:100472. doi:10.1016/j.intert.2021.100472
44. Mehmoord J, Jabeen F, Iftikhar Y, et al. Elucidating the effects of organisational practices on innovative work behavior in UA public sector organisations: the mediating role of employees’ wellbeing. Appl Psychol Health Well Being. Published online February 3, 2022. doi:10.1111/APHW.12343
45. Pang H. How compulsive WeChat use and information overload affect social media fatigue and well-being during the COVID-19 pandemic? A stressor-strain-outcome perspective. Telematics Inform. 2021;64:101690. doi:10.1016/J.TELE.2021.101690
46. Ghali H, Ben Cheikh A, Bhiri S, Khelfacha S, Latiri HS, Ben Rejeb M. Trends of healthcare-associated infections in a Tunisian University Hospital and impact of COVID-19 pandemic. Inquiry. 2021;58:00469580211067930. doi:10.1177/00469580211067930
47. Lee CJ, Niederdeppe J, Freres D. Socioeconomic disparities in fatalistic beliefs about cancer prevention and the Internet. J Commun. 2012;62(6):972-990. doi:10.1111/j.1460-1462.2012.01683.x
48. Bachem R, Tsur N, Levin Y, Abu-Raiya H, Maercker A. Negative affect, fatalism, and perceived institutional betrayal in times of the Coronavirus pandemic: a cross-cultural investigation of control beliefs. Front Psychiatry. 2020;11:589914. doi:10.3389/fpsyt.2020.589914
49. Pearlin LI, Lieberman MA, Menaghan EG, Mullan JT. The stress process. J Health Soc Behav. 1981;22(4):337-356. doi:10.2307/2136676
50. Jimenez T, Restar A, Helm PJ, Cross RI, Barath D, Arndt J. Fatalism in the context of COVID-19: perceiving coronavirus as a death sentence predicts reluctance to perform recommended preventive behaviors. SSM Popul Heal. 2020;11:100615. doi:10.1016/J.SSMPH.2020.100615
51. Koeske GF, Koeske RD. A preliminary test of a stress-strain-outcome model for reconceptualizing the burnout phenomenon. J Soc Serv Res. 1993;17(3-4):107-135. doi:10.1300/J079v17n03_06
52. Mehmoord K, Li Y, Jabeen F, Khan AN, Chen S, Khalid GK. Influence of female managers’ emotional display on frontline employees’ job satisfaction: a cross-level investigation in an emerging economy. Int J Bank Mark. 2020;38(7):1491-1509. doi:10.1108/IJBM-03-2020-0152
53. Nawaz Khan A. Is green leadership associated with employees’ green behavior? Role of green human resource management. J Environ Plan Manag. Published online March 30, 2022. doi:10.1080/09640568.2022.2049595
54. McCarthy JM, Truxillo DM, Bauer TN, et al. Distressed and distracted by COVID-19 during high-stakes virtual interviews: the role of job interview anxiety on performance and reactions. J Appl Psychol. 2021;106(8):1103-1117. doi:10.1037/apl0000943
55. Roberts RE, Roberts CR, Chen IG. Fatalism and risk of adolescent depression. Psychiatry. 2000;63(3):239-252. doi:10.1080/00327472.2000.11024917
56. Jamieson PE, Romer D. Unrealistic fatalism in U.S. youth ages 14 to 22: prevalence and characteristics. J Adolesc Health. 2008;42(2):154-160. doi:10.1016/J.JADOHEALTH.2007.07.010
57. Houston JB, Spialek ML, First J. Disaster media effects: a systematic review and synthesis based on the differential susceptibility to media effects model. J Commun. 2018;68(4):734-757. doi:10.1093/JOC/JQY023
58. Thompson RR, Garfin DR, Holman EA, Silver RC. Distress, worry, and functioning following a global health crisis: a national study of Americans’ responses to Ebola. Clin Psychol Sci. 2017;5(3):513-521. doi:10.1177/2167702617692030
59. Thompson RR, Jones NM, Holman EA, Silver RC. Media exposure to mass violence events can fuel a cycle of distress. Sci Adv. 2019;5(4):eaav3502. doi:10.1126/sciadv.aav3502
60. Zhao N, Zhou G. Social media use and mental health during the COVID-19 pandemic: moderator role of disaster stressor and mediator role of negative affect. Appl Psychol Health Well Being. 2020;12(4):1019-1038. doi:10.1111/APHW.12226
61. Christopher Westland J. Lower bounds on sample size in structural equation modeling. Electron Commer Res Appl. 2010;9(6):476-487. doi:10.1016/J.ELERAP.2010.07.003
62. Podsakoff PM, MacKenzie SB, Lee J-Y, Podsakoff NP. Common method biases in behavioral research: a critical review of the literature and recommended remedies. J Appl Psychol. 2003;88:879-903.
63. Bo L, Sminichescu C. Efficient match kernels between sets of features for visual recognition. Comput Complex. 2009;20(1):1-9. doi:10.1002/hrdq
64. Khan NA, Khan AN. What followers are saying about transformational leaders fostering employee innovation via organizational learning, knowledge sharing and social media use in public organisations? Gov Inf Q. 2019;36(4):101391. doi:10.1016/J.GIQ.2019.07.003
65. Swar B, Hameed T, Reychav I. Information overload, psychological ill-being, and behavioral intention to continue online healthcare information search. Comput Human Behav. 2017;70:416-425. doi:10.1016/J.CHB.2016.12.068
66. Shen L, Condit CM, Wright L. The psychometric property and validation of a fatalism scale. Psychol Health. 2009;24(5):597-613. doi:10.1080/08870440801902535
67. Wharton AS. The affective consequences of service work: managing emotions on the job. Work Occup. 1993;20(2):205-232.
68. Main A, Zhou Q, Ma Y, Luecken LJ, Liu X. Relations of SARS-related stressors and coping to Chinese college students’ psychological adjustment during the 2003 Beijing SARS
69. Hair J, Black W, Babin B. *Multivariate Data Analysis*, 7th ed. NY Pearson; 2010.

70. Hu L, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Struct Equ Model*. 1999;6(1):1-55.

71. Bagozzi RP, Yi Y. On the evaluation of structural equation models. *J Acad Mark Sci*. 1988;16(1):74-94.

72. Anderson JC, Gerbing DW. Structural equation modeling in practice: a review and recommended two-step approach. *Psychol Bull*. 1988;103(3):411-423.

73. Khan NA, Khan AN, Gul S. Relationship between perception of organizational politics and organizational citizenship behavior: testing a moderated mediation model. *Asian Bus Manag*. 2019;18(2):122-141. doi:10.1057/s41291-018-00057-9

74. Grant AM. Leading with meaning: beneficiary contact, prosocial impact, and the performance effects of transformational leadership. *Acad Manag J*. 2012;55:458-476.

75. Hayes AF. *Introduction to Mediation, Moderation, and Conditional Process Analysis*. Guilford Press; 2013.

76. Preacher KJ, Rucker DD, Hayes AF. Addressing moderated mediation hypotheses: theory, methods, and prescriptions. *Multivariate Behav Res*. 2007;42(1):185-227.

77. Farpour HR, Habibi L, Owji SH. Positive impact of social media use on depression in cancer patients. *Asian Pac J Cancer Prev*. 2017;18(11):2985-2988. doi:10.22034/APJCP.2017.18.11.2985

78. Doyle L, Kelliher F, Harrington D. Multi-level learning in public healthcare medical teams: the role of the social environment. *J Health Organ Manag*. 2020;35:88-105. doi:10.1108/JHOM-05-2019-0135

79. Patwary MM, Bardhan M, Browning MHEM, et al. Association between perceived trusted of COVID-19 information sources and mental health during the early stage of the pandemic in Bangladesh. *Healthcare*. 2021;10(1):24. doi:10.3390/HEALTHCARE10010024

80. Roseman IJ, Antoniou AA, Jose PE. Appraisal determinants of emotions: constructing a more accurate and comprehensive theory. *Cogn Emot*. 1996;10(3):241-278. doi:10.1080/026999396380240

81. Ángeles López-Cabarcos M, López-Carballeira A, Ferro-Soto C. How to moderate emotional exhaustion among public healthcare professionals? *Eur Res Manag Bus Econ*. 2021;27(2):100140. doi:10.1016/j.iedeen.2020.100140

82. Abdel-Basset M, Chang V, Nabeeh NA. An intelligent framework using disruptive technologies for COVID-19 analysis. *Technol Forecast Soc Change*. 2021;163:120431. doi:10.1016/j.techfore.2020.120431

83. Zeng J, Chan CH, Fu KW. How social media construct “Truth” around crisis events: Weibo’s rumor management strategies after the 2015 Tianjin Blasts. *Policy Internet*. 2017;9(3):297-320. doi:10.1002/poi.155