

The Psychological Impact of the COVID-19 Pandemic and Rumination as an Overlooked Psychopathological Mechanism

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Abstract

For over a year, the global coronavirus disease 2019 (COVID-19) pandemic has been humanity's greatest public health issue. During this time, clinicians and researchers worldwide have reported on the negative psychological impact due to safety measures that were implemented to curb the spread of this deadly disease (i.e., closing businesses, working from home, social distancing, quarantine, etc.). However, most of the published research about this topic has focused on complications to instrumental functioning (e.g., job loss, reduced income, shortages of supplies, increased child-care burdens, etc.), and how they lead to increased distress and reduced well-being. In contrast, little research has investigated how pandemic life has changed how we think about ourselves, our circumstances, and our futures, or how these cognitive factors have led to worsened mental health. In this article, we reviewed the literature on the psychological impact of the COVID-19 pandemic, with a major focus on the overlooked cognitive process of rumination (i.e., repetitive thinking about oneself and one's problems). We explained how rumination translated pandemic-related stress into psychopathological outcomes such as increased depression, anxiety, post-traumatic stress, and substance misuse. We also recommended strategies for mitigating the negative effects of pandemic-related rumination and provided recommendations for future directions regarding pandemic-related mental health research.

Introduction

In response to the sudden, global spread of coronavirus disease 2019 (COVID-19), governments worldwide enacted social and public health safety measures that nearly halted whole economies and drastically changed our lives. These measures included closing non-essential businesses, restricting travel, social/physical distancing, stay-at-home orders, quarantine, etc. These measures were crucial to "flatten the curve", mitigate the spread of disease, and avoid overburdening our healthcare systems. Since COVID-19 arose at the end of 2019, ~120 million confirmed cases and ~2.7 million deaths have been recorded; in Canada, these numbers are ~913k and ~22.5k, respectively [1]. Despite the tragic toll caused by COVID-19, the spread of the diseases has been largely controlled by these public safety measures. Some esti-

mates even suggest that infection rates could have been dozens to hundreds of times higher within the first few months, had these safety measures not been implemented [2,3]. These protocols have saved many lives and protected many people from infection, but what have they done to our mental health? In this paper, we reviewed how the COVID-19 pandemic increased stress and negatively impacted mental health worldwide, paying special attention to the role of rumination (i.e., repetitive thinking about oneself and one's problems) in mediating the link between stress and psychopathology. Further, we explained how rumination can be used adaptively. Finally, we concluded with recommendations for future research about pandemic-related stress and psychopathology.

The Psychological Impact of the COVID-19 Pandemic

Around the globe, depression, anxiety, post-traumatic stress, insomnia, substance misuse, obsessive-compulsive symptoms and many other psychological problems have drastically risen during the pandemic. These problems were not only due to the stress from COVID-19 infections [4,5] or the fear of being infected [6,7], but also due to government-sanctioned stay-at-home and social restriction protocols [8-11]. Similar trends have been observed in Canada [12-14]. This is because public safety measures have led to financial insecurity and social isolation, resulting in profound socioeconomic and interpersonal consequences in the process [9,12,13]. Within the first several months of the pandemic, the number of severely depressed and anxious Canadians approximately doubled and quadrupled, respectively [12]. Additionally, ~80% of Canadian psychiatric patients reported a worsening of their symptoms, especially those with low levels of social interaction and sense of control [15]. Reports by Statistics Canada have shown that the number of Canadians who rated their perceived mental health as below “very good”, on a 5-point Likert scale ranging from “poor” to “excellent”, increased from 31% in 2018 to 46% and 52% in April and May 2020, respectively [16,17]. A survey from March 2021 reported that 1 in 5 Canadians were screened positive for either major depressive disorder, generalized anxiety disorder, or post-traumatic stress disorder, 68% of whom reported their mental health being worse since the start of the pandemic [18]. In other words, the public’s safety has come directly at the cost of their mental well-being, not only due to increased life stress (e.g., business closures, supply shortages, etc.), but the restricted social interaction that could have helped buffer the consequences of that stress. Importantly, the psychological consequences of the pandemic have not just been observed in people required to quarantine themselves [13]; most of the same problems have been observed in people following less restrictive safety protocols as well [8-10,13,14]. There are many reasons that COVID-19 stress has led to increased psychopathology, which have received much attention in the literature (e.g., fear of infection, lack of social support, uncertainty about the future, socioeconomic changes, etc.). However, there is one overlooked mediator that might be critical for linking

pandemic-related stress to psychopathology across diverse populations: rumination. After all, besides the common pandemic-related problems mentioned above, what is one thing in common across much of the population during a pandemic? It is the experience of repetitive, recurrent, cognitively demanding thoughts about these problems, which happens alongside the chronic physiological stress response to these problems. This process results in an increase in ruminative thoughts about the problems, such as how they relate to oneself and one’s future. These thoughts can occupy the mind incessantly when people are alone or inactive during times of stress, which amplifies negative mood states, maintains the stress response, and increases the risk and severity of psychopathology [19-28].

It is important to highlight this distinction between the level of stress exposure and the tendency to ruminate about those stressors. This is because the level of pandemic-related stress is often outside of one’s control; what may not be, however, is how often one ruminates about these stressors and in what way. The capability for individuals to learn how to control ruminative thinking means that rumination may be a good target for intervention in a way that individuals’ pandemic-related problems, and indeed, their psychopathology, cannot be. Therefore, a call to emphasize rumination as an area for future pandemic-related stress research is warranted.

COVID-19 Pandemic Stress and Rumination

Rumination has many definitions across different areas of basic and clinical research (reviewed in Watkins [19] and Smith & Alloy [20]). This is because it can take on different forms (e.g., deliberate, intrusive, anger, positive, etc.) depending on many factors such as trigger (e.g., feelings, chronic stress, unattained goals, provocations, etc.), valence (positive or negative), temporal orientation (past, present, or future), and more [19-28]. While several theories of adaptive rumination exist, which are described further below, it is the maladaptive forms that are most likely to explain the link between COVID-19 stress and psychopathology.

The H-Ex-A-Go-N (Habit, Executive functioning, Abstract processing style, Goal discrepancy, Negative biases) model of depressive rumination is useful to

illustrate how maladaptive forms of rumination occur [21]. According to this model, a perceived discrepancy between one's current state and a desired goal triggers state rumination. These triggers are often negative feelings or unattained goals, but many theories posit other triggers as well, including stressful, disappointing, or anger-inducing events, intrusive memories, and more [19-28]. People typically ruminate to resolve internal discrepancies, understand their feelings, themselves, others, and the world, as well as prepare for the future. However, due to memory and executive functioning limitations, rumination often does not take on its intended form. In people with an abstract processing style especially, rumination can involve asking oneself abstract questions about ill-defined problems that have no clear answer or solution [21]. Such questions may include: "why is everyone so much more capable than I am?", "why can't I handle the stress of the pandemic better?", and so on. This process tends to produce unsatisfactory answers, amplifying negative thoughts and feelings that triggered rumination in the first place. Thinking becomes more negatively biased because of this, which can lead to negative interpretations of ambiguous information and preferential recall of negative memories. Negative mood is prolonged further as a result. This feedback loop between negative thought and mood perpetuates rumination in a vicious cycle until a satisfactory answer or solution is found – or more likely, the person learns to abandon the goal, engage in deliberate analysis, and/or structured problem solving instead of ruminating. They may also use constructive distraction strategies (e.g., behavioural activation, social engagement, etc.) to break themselves out of the cycle. Otherwise, continued rehearsal of state rumination under similar circumstances forms a habit of responding known as trait rumination [21], which is a major risk factor for many forms of psychopathology [19-28].

Few studies have directly examined how rumination mediates the effects that COVID-19 stress has on psychopathology. This is surprising given that rumination is known to be a critical transdiagnostic risk factor for many psychiatric disorders (e.g., mood, anxiety, eating, substance use disorders, etc.) [29] that have been shown to be worsened by the pandemic. Also, rumination is known to run amok in people who are less able to adaptively distract themselves from negative thoughts and feelings, especially during periods of social withdraw-

al/isolation and silence [24,28,30], which would be expected to occur to a large degree during the pandemic. Ye and colleagues [31] conducted a study that explicitly examines rumination as a mediator between COVID-19 stressors and their psychological consequences. Not only did they find that depressive rumination significantly mediated this association, but that this effect was stronger in individuals who received insufficient psychological support from their environment and social network. No other studies were found so far that measured pandemic-related stressors, unfortunately, but some other valuable insights are worth mentioning. In a follow-up to their previous study, Ye and colleagues [32] found that pandemic-related rumination predicted depression severity, and this effect was partially mediated by fatigue. Additionally, Arslan, Yildirim, & Aytac [33] found that anxiety about the pandemic predicted depressive rumination scores, and that this association was significantly mediated by loneliness, highlighting the negative toll that social isolation has had on psychopathological mechanisms (e.g. rumination). In another study focusing on the indirect effects of rumination, Satici and colleagues [34] found that the negative effect that participants' intolerance of uncertainty had on mental well-being was serially mediated, first by rumination, and then by COVID-19 fear. This was likely because intolerance of uncertainty about the pandemic leads to rumination and fear about those concerns, which negatively impacts mental well-being. The studies summarized above have been a good start to better understand the links between COVID-19 stress, cognitive risk factors, and psychopathology, but more work is sorely needed to understand the interplay between these factors, as well as how they arise and are mitigated by public health policies.

Improving Mental Health During the Pandemic

Several methods can mitigate the negative effect of pandemic-related rumination on mental health, in part by reducing maladaptive rumination and/or increasing adaptive rumination. First, behavioural deactivation has been frequently implicated in depressive rumination [29,35]. In general, being deprived of the opportunity to behaviourally distract oneself increases the probability of ruminating about one's current situation. To combat this, people are suggested to participate often in online and offline activities that they

enjoy, as allowed by governmental social restrictions. However, it is important to point out that psychosocial problems due to excessive rewarding behaviours (e.g., gambling, substance use, gaming, media and pornography consumption, etc.) have also been observed during the pandemic [12,36,37]. Therefore, people should be cautious about the way they choose to distract themselves from their ruminative thoughts. Behavioural activation is a big component of rumination-focused cognitive behavioural therapy (RFCBT), a new form of CBT that targets the process of thinking rather than its contents, as in traditional CBT [38].

Second, mindfulness-based therapy (MBT) and mindfulness-based stress reduction (MBSR) are effective treatments for depressive rumination [39,40]. Mindfulness-based interventions aim to develop a nonjudgmental perspective towards oneself and one's current situation by utilizing techniques such as body scan, Hatha yoga, walking meditation, and more [40]. These traditional meditation techniques can be used to reduce maladaptive rumination, but more importantly, people are encouraged to try learning acceptance of their current situation and form a nonjudgmental view towards the pandemic when not meditating as well. Third, actively seeking information from a limited number of official sources is helpful to reduce the uncertainty about the pandemic [41,42]. This is because unofficial channels, such as social media, are filled with conflicting information during public crises like COVID-19. When people are not able to distinguish useful information from rumors, the ambiguity adds to their stress [42] and potentially their tendency to ruminate.

Finally, it may be possible to learn adaptive rumination strategies instead of maladaptive ones for handling stress. When revising the widely used Ruminative Response Scale (RRS), Treynor and colleagues [43] discovered that depressive rumination was made up of reflective pondering and brooding; reflection was thought to be a constructive process in which people introspect about their experience and productively look for solutions. Watkins [44] also conceptualized rumination as having some adaptive outcomes. Experiential self-focused rumination, which focuses on one's negative self-experience and problems in a detail-oriented way, was thought to promote recovery

from stress [45]. Repetitive thought research has also revealed that rumination can lead to adaptive preparation and planning, recovery, and increased health-promoting behaviours in some circumstances [19].

The question then becomes how to make rumination adaptive. According to Watkins [19,44], maladaptive forms of rumination are characterized by abstract, over-general processing, whereas adaptive ones are more concrete and specific, thus allowing thinking to be constructive. In the context of COVID-19, people are encouraged to spend more time thinking about solutions to specific problems (e.g., academic disruption, supply shortage, social restrictions, etc.) instead of asking vague questions such as "why is this happening to me?". Taking control of rumination in this way is another major component of RFCBT [38]. Other suggestions to resist negative psychological impacts of COVID-19 include maintaining satisfactory interpersonal relationships, particularly family relationships, cognitively focusing on the positive side of the pandemic, and recognizing the transience of the crisis [40,45,46].

Future Directions and Conclusion

Before closing, it is worth highlighting some important limitations of the current research about the psychological impact of COVID-19, along with future directions in this research area. First, current knowledge about the psychological impact of COVID-19 is difficult to generalize across studies. Rather than comparing the psychological impact of COVID-19 across diverse groups, most research has been either based on samples selected from limited geographic areas (e.g. China and Canada), or focused on one group from a particular area (e.g., college students, nurses, workers, etc.). So vulnerable groups may be properly treated during the pandemic and afterward [47], it is imperative that future studies compare the cognitive processes and outcomes underlying the psychological impact of COVID-19 among a variety of demographic populations. Moreover, research so far has focused predominantly on a small number of mental health outcomes, such as depression, anxiety, and PTS, with little priority given to the understanding of maladaptive cognitive processes (e.g. rumination) that may lead to the psychological distress and subsequent psychopathology. Indeed, it has been suggested that a thorough investigation of a diverse set

of brain functions and cognitions is needed for us to understand the short- and long-term psychological impacts of this pandemic [47]. We echo that sentiment here with specific focus on cognitive risk factors like rumination. Second, research about the psychological impact of COVID-19 has also been too broad. It has often investigated high-order constructs (e.g., mental wellbeing, mental health, distress, etc.) without differentiating their subtypes. For instance, researchers have failed to account for the heterogeneity of rumination (e.g., depressive rumination, angry rumination, positive rumination, etc.), often treating it as a unidimensional construct instead. However, different kinds of rumination have different effects on mental well-being, and thus treating it as unidimensional is inappropriate. Indeed, we recently observed this in a study we are preparing for publication, in which we found that rumination only mediated the associations of COVID-19 stress with depression and anxiety if the thoughts about the pandemic were intrusive, involuntary, and ongoing, occurring regardless of one's effort to suppress them (i.e., intrusive rumination). Deliberate rumination was reported more highly in people with greater COVID-19 stress as well, but unlike intrusive rumination, this did not mediate the associations that stress had with depression and anxiety. This differentiation highlights rumination's heterogeneous structure and the imperative to study its subtypes separately. A detailed understanding of specific cognitive risk and resilience factors is critical, such as maladaptive and adaptive forms of rumination, respectively. As described above, these processes can be targeted through psychological intervention more directly than broadly defined constructs such as "well-being", "distress" and even "depression" (e.g., rumination-focused cognitive behavioural therapy, behavioural activation, etc.) [30,38,48]. Understanding the core distinctions between different types of rumination is required to understand how they should be treated.

Third, more research should be directed toward understanding practical public and mental health concerns, including how to mitigate the negative mental health consequences of the pandemic, improve psychological and social interventions, and counteract the negative effects of social media on psychopathology (e.g., by reducing exposure to fear-inducing pandemic-related stimuli) [47]. Some scholars have proposed that social

and behavioral science can be incorporated to help with our understanding [49]. Evaluating factors such as cultural influence, moral decision-making, and political polarization may inform us about which strategies work in different social contexts and with different groups [49].

Finally, most studies have been using cross-sectional self-report data. The correlational nature of these data limits our understanding of directionality between stress, cognitive process, and psychological distress. Given the unpredictability of the outbreak of COVID-19 and social lockdown practices during the pandemic, it has been difficult for researchers to accurately obtain retrospective data from before the pandemic or use longitudinal procedures to infer the directionality or time course of effects. If we can overcome these difficulties and compare participants' responses over time and relate them to the severity of the safety measures put in place at different times, we can characterize and improve our social reintegration and mental health trajectories during the post-pandemic recovery period.

In conclusion, the social restrictions and safety procedures implemented by governments worldwide to control the COVID-19 pandemic have saved many lives, but they have also severely impacted the mental health of a significant portion of the population. A significant but overlooked cognitive mediator of psychopathology due to pandemic-related stress is the tendency to maladaptively ruminate about that stress. The dearth in the literature about this mechanism is inopportune, given that rumination is a transdiagnostic factor that likely explains much of the pandemic-related increase in psychopathology. Moreover, rumination is readily targetable by a variety of psychosocial treatments and self-help strategies that could be implemented as complementary public health policy. More research is required to establish which kinds of rumination mediate and mitigate the effects that different pandemic-related stressors have on psychopathology. Information about these mechanisms is crucial for our mental health recovery during the rest of the pandemic and beyond; without it, we will not be prepared for the psychological impact caused by the next pandemic or large-scale emergency.

Resources

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