

Systematic Literature Review on Mindset and the Benefits in Living New Normal Life

Ira Adelina^a, Vida Handayani^b and Maria Yuni Megarini^c

Faculty of Psychology, Maranatha Christian University, Surya Sumantri 65, Bandung, Indonesia

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Abstract: Pandemics are associated with lots of psychosocial stressors, such of separation of family and friends, shortages of food and medicine, wage loss, social isolation, financial hardship, death, trauma, and so on. The psychological effects of the pandemic will likely be more pronounced, more widespread, and longer lasting than the purely somatic effects of infection. This pandemic period causes intense stress for individuals. Mindset, as a belief whether ability and intelligence are fixed or changeable traits, plays a critical role in how we cope in life's challenges. This research uses descriptive method, in a form of systematic literature review from more than 50 articles, taken from psychological and medical journals in the last 35 years. The journals related to the pandemic situation from medical and psychological perspectives, along with its interventions. Based on this review, we conclude that mindset plays an important role in individual's appraisals and responses to stressors. Responses given by individual's can be adaptive responses that lead to effective coping, or maladaptive and lead to coping that is ineffective and even malfunctioning and disrupted health during pandemic.

1 INTRODUCTION

Pandemics are large-scale epidemics afflicting millions of people across multiple countries, sometimes spreading throughout the globe (WHO, 2010b). According to Killbourne (1977) in Taylor (2019), for a virus or bacterium to cause a pandemic it must be an organism for which most people do not have pre-existing immunity, transmitting easily from person to person, and causing severe illness. Diseases causing pandemics are part of a group of conditions known as emerging infectious diseases, which include newly identified pathogens as well as re-emerging ones.

Coronavirus disease 2019 (COVID-19), which reported in an outbreak in 2019 in Wuhan, Hubei province, China, is caused by the SARS-CoV-2 virus. Coronavirus (CoV) is among the main pathogenic organisms that affect the respiratory system in humans. In December 2019, the prevalence of the virus increased at an epidemic rate since its first occurrence in Wuhan. On 11 February 2020, the

novel virus began to cause pneumonia, and was named as coronavirus disease 2019 (COVID-19) by the World Health Organisation (WHO). Currently, COVID-19 cases have been recorded globally (Rauf, Et. Al., 2020). According to JHU CSSE Covid-19 data on 23 April 2021, reports indicated that **140,849,925** individuals were infected with the disease of whom **3,013,217** died (Dong, Du, & Gardner, 2020).

Pandemics are "frequently marked by uncertainty, confusion and a sense of urgency" (WHO, 2005). Prior to, or in the early stages of a pandemic, there is widespread uncertainty about the odds and seriousness of becoming infected, along with uncertainty, and possible misinformation, about the best methods of prevention and management. Uncertainty may persist well into the pandemic, especially concerning the question of whether a pandemic is truly over. Pandemics can come in waves. Waves of infection are caused, in part, by fluctuations in patterns of human aggregation, such as seasonal movements of people away from, and then

^a <https://orcid.org/0000-0003-3720-8211>

^b <https://orcid.org/0000-0002-3544-9559>

^c <https://orcid.org/0000-0001-6563-6251>

into contact with, one another (Taylor, 2019)

Pandemics are related with a score of other psychosocial stressors, counting wellbeing dangers to oneself and others, extreme disturbances of schedule, partition from family and friends, deficiencies of nourishment and medication, loss, social isolation because of quarantine or social distancing programs and school closure, and individual budgetary challenge. The personal financial impact of a pandemic can be as severe and stressful as the infection itself, especially for people who are already experiencing financial difficulties (Taylor, 2019).

People differ in how they react to psychosocial stressors such as the threat of, or an actual occurrence of, a pandemic. Reactions can be diverse, ranging from fear to indifference to fatalism. Some people underestimate the risks, so they are less engaged in recommended health behaviors such as vaccination, hygiene practices, and social distancing. At the other hand, many people react with intense anxiety or fear. Actually, a moderate level of fear or anxiety can motivate people to cope with health threats, but severe distress can be debilitating (Taylor, 2019).

People develop beliefs that organize their world and give meaning to their experiences. These beliefs are called "meaning systems", and different people will create different meaning systems. We have belief systems that give structure to our world and meaning to our experiences. People's beliefs about themselves can create different psychological world, leading them to think, feel, and act differently in identical situations. Meaning systems are important in shaping our thinking. The meaning systems that people adopted were as important or even more important in shaping their thinking (Dweck, 2000). A mindset is defined as a mental frame or lens that selectively organizes and encodes information, thereby orienting an individual toward a unique way of understanding an experience and guiding one toward corresponding actions and responses (Crum, Salovey, & Achor, 2013).

Many studies examine how a person's mindset affects the way he interprets and solves problems. When facing challenging problems, people who believe that effort drives intelligence tend to do better than people who believe that intelligence is a fixed quality that they cannot change. Individual with a fixed mindset avoids challenges, gives up effortlessly, sees effort as vain or more regrettable, overlook valuable negative input, and feels debilitated by the others succeeds. In the meantime, people with a growth mindset embraces challenge, persists despite setbacks, sees effort important to gain mastery, learns from mistakes and criticisms, and

finds lessons and motivation in others success. People with a growth mindset believe that they can develop their abilities through hard work, persistence, and dedication (Dweck, 2006; Elliot & Dweck, 2005; Weiner, 2005). Research also suggests that good problem solvers are qualitatively different from poor problem solvers (National Research Council, 2004; Schoenfeld, 2007). Good problem solvers are flexible and resourceful. They have many ways to think about problems, have alternative approaches if they get stuck, ways of making progress when they hit roadblocks, of being efficient with (and making use of) what they know.

Other studies examine how the role of mindset in dealing with stressful situations. Stress mindset is related with psychological stress responses, through coping strategies (Horiuchi, Tsuda, Aoki, Yoneda, & Sawaguchi, 2018). Crum et al. (2013) found that individuals with a stronger stress-is-enhancing mindset utilized approach and active coping more frequently and avoidant or withdrawal coping less frequently. They showed that coping and stress mindset were independently related with psychological stress responses. Researches related to the pandemic situation also turned out to provide many findings on how mindset changes can help overcome the pandemic situation. Therefore, the purpose of this study is to integrate all of these findings and explain them systematically and thoroughly.

2 METHODS AND MATERIALS

This research based on descriptive methods in form of systematic literature review. Articles related to this literature review were searched through a computer-based article data search program, the Google Scholar, Scopus, and Proquest program. The keywords are mindset, stress, and pandemic. All the article findings were considered according to the criteria as a requirement. The inclusion criteria for an article to meet the requirements for analysis is that the research contains a pandemic condition which explains the mindset and stress variables. The primary study was conducted using a survey that examined the mindset. Based on the inclusion criteria that have been set, it was found 50 research articles started from 1994 and the following data were processed into 22 studies. The research articles found were taken from the Journal of Public Health Management and Practice, Behavioral and Cognitive

Psychotherapy, Journal of Personality and Social Psychology, Journal of Psychiatry, Psychological Review, International Journal of Health Management and Information, American Journal of Public Health, Stress and Health Journal, Journal of Abnormal Psychology, Journal of Health Communication, Journal of Behavioral Medicine, Psychiatry Research, Clinical Psychology Review, and Journal of Health Psychology. The results of the research findings are then arranged into a table, analysed through logical thinking, and then a conclusion is drawn.

3 RESULT AND DISCUSSION

Research results can be found in table 1.

Table 1: Systematic literature review results.

No	Researcher	Keywords	Results
1	Loeb & Dweck (1994)	Stress, mindset	People with growth mindset tend to take a more direct and active problem-solving approach.
2	Dweck (2000)	Stress, mindset	Growth mindset may help us to construct the lives we want and to maintain the flexibility to reconstruct them when things go wrong.
3	Taylor & Asmundson(2004)	Stress, mindset, health	Grossly inaccurate beliefs can contribute to excessive health anxiety.
4	Taylor & Asmundson(2004); Wheaton, Abramowitz, Berman, Fabricant, & Olatunji (2012)	Stress, mindset	People with excessive health anxiety tend to misinterpret harmless bodily sensations.
5	WHO (2008, 2012); World Health organization Writing Group (2006)	Stress, mindset, pandemic	Psychological factors are also relevant for understanding and addressing the socially disruptive behavioral patterns that can arise as a result of widespread, serious infection. Contemporary methods for managing pandemics are largely behavioral or educational interventions.
6	Levi, Segal, St. Laurent, & Lieberman(2010)	Mindset, pandemic	Attitudes about vaccination are influenced by one's beliefs about the vaccination.
7	Crum et al., (2013)	Stress, mindset, health	Stress mindset alters health-related outcomes.
8	Dweck, (2017)	Stress, mindset	Several personality traits have been linked to the vulnerability to experience

			negative emotions in response to stressors. - Those with the growth mindset, believe they can develop their selves, open to accurate information about their current abilities, oriented toward learning. - Cognitive therapy helps people make more realistic and optimistic judgments into the framework of growth.
9	Leventhal, Phillips, & Burns, (2016)	Stress, mindset, health	People can hold erroneous beliefs about what is an effective treatment
10	Taylor, (2017)	Mindset, pandemic	People with persistent pandemic related PTSD would likely benefit from empirically supported treatments such as trauma-focused CBT.
11	Gautreau et al (2015); Hagger, Koch, Chatzisarantis, & Orbell, (2017)	Mindset, stress	Cognitive-behavioral models propose that excessive anxiety about one's health is triggered by the misinterpretation of health-related stimuli.
12	Cooper, Gregory, Walker, Lambe & Salkovskis, (2017); Steven Taylor & Asmundson, (2004)	Mindset, stress	Cognitive-behavioral models suggest that excessive health anxiety can be addressed by targeting dysfunctional beliefs and maladaptive behaviors.
13	Taylor & Asmundson(2004); Tyrer & Tyrer (2018)	Mindset, stress	CBT, as conducted by a therapist, is currently the first-line treatment for excessive health anxiety.
14	Tang, Bie, Park, & Zhi, (2018)	Mindset, stress, pandemic	Social media can fuel or quell fears, and they can influence the spreading of disease by influencing people's behavior.
15	Keech, Hagger, & Hamilton (2021)	Stress, mindset	A stress-is enhancing mindset can be induced through intervention and have been shown to be effective in mitigating negative outcomes to highly stressful events.
16	Taylor (2019)	Mindset, stress, pandemic	- Cognitive and behavioral factors play a role in shaping the severity of health anxiety: Misinterpretations of health-related stimuli, maladaptive or distorted beliefs, memory and attention processes, and maladaptive behaviors - Beliefs and fears about diseases, just like diseases themselves, spread through social networks. Beliefs and rumors also influence the spread of infection.

Mindset is grounded on implicit theories, which are knowledge structures about the malleability of an

attribute such as intelligence and personality that organize the way people ascribe meaning to events. Research on implicit theories distinguishes between two main beliefs or mindsets: an incremental or growth mindset and an entity or fixed mindset (Dweck, 2000; Dweck & Leggett, 1988). Those with growth mindsets believe that human attributes are malleable and therefore can be cultivated through hard work, good strategies, and support from others. They have a dynamic self and a dynamic world, capable of growth. These beliefs help us move forward with determination, encourage us to look for ways to remedy our deficiencies and to solve our problems. In contrast, other beliefs portray a more static self and world with inherent, fixed qualities. Those with fixed mindsets believe that human attributes are fixed and therefore cannot be developed, regardless of the effort expended or strategy employed. These beliefs may have some advantages, because they portray a simpler world that is potentially easy to know, and there may be a great deal of security in that. Entity beliefs can lead us to make more rigid judgements, sometimes blinding ourselves from our capabilities, and limiting the path we pursue. Research finds that people can hold different mindsets in different domains and the effects are typically stronger for domain-specific assessments (Scott & Ghinea, 2014). These beliefs are part of people's motivational systems. People's mindset has impact on their judgment, evaluations, health, and behavior. Using one mindset or another can significantly influence psychological, behavioral, and physiological results in life and health domains (Crum et al., 2013).

People tend to feel positive or negative emotions because of the meaning they give to something that has happened. Seligman and his colleagues set about assessing individual differences in the kinds of causal explanations that people tend to make for negative events in their lives. They called this "explanatory styles". Some people tend to focus on more pessimistic explanations for negative events, blaming more global and stable factors, while other tend to focus on more optimistic explanations, blaming more specific and temporary ones (Dweck, 2000).

Cognitive-oriented theories of mental health and psychotherapy start with the assumption that people's erroneous beliefs can get them into trouble. There are series of beliefs that characterize individuals who are vulnerable to emotional distress. Pessimistic explanatory styles are also cognitive models of vulnerability. While not denying biological contributions to emotional disorders, research therapies in this field show that many people with

depression or anxiety disorders are victims of their maladaptive beliefs and alteration in these beliefs will help them greatly (Dweck, 2000).

An entity theory framework can lead people to overgeneralize from one experience, to categorize themselves in unflattering ways, to set self-worth contingencies, to exaggerate their failures relative to their successes, to lose faith in their ability to perform even simple actions, to underestimate the efficacy of effort – all things that have been implicated in depression. Pessimistic explanatory styles went on the power of a helpless, and the power of an optimistic explanatory styles to predict mental and physical health (Dweck, 2000). Vulnerable people don't just think and react in different ways from less vulnerable people. They also value different goals. Compared with the less vulnerable people, they are more concerned with validating themselves and less concerned with growth and self-development (Dweck, 2000).

Individual appraisal of the causes of stress will determine their response. Research conducted by Lazarus and Folkman, highlighted the importance of cognitive appraisal in determining responses to stress. The study proposes that individuals initially assess the extent to which the situation is considered demanding (primary appraisal) and then assess whether they have sufficient resources or not to cope with the situation (secondary appraisal). Recently, researchers describe the stages of how individuals assess a situation and highlight that the response to stress is determined by the balance of perceived resources (knowledge and skills), perceived demands (danger and uncertainty), and the identification of the physiological support for the challenges and threats of these individual assessments (Crum, Akinola, Martin, & Fath, 2017).

Stress mindset refers to the properties and desires attributed to stress; coping refers to the process of appraising threat and organizing cognitive and behavioral resources to encounter stress when it does occur. In other words, whereas stress mindset may inform the coping strategy that one adapts, as the mental and motivational situation in which coping activity are chosen and occupied, it isn't by itself a coping strategy (Crum et al., 2013).

Mindsets plays an important role in stress appraisals which will then determine individual's reactions to stressors are adaptive and point to effective coping, or maladaptive and end in ineffective coping and compromised health and wellbeing. The main point of these concept is that people who appraise stress as challenging and have beliefs that stress can be enhancing and encouraging

interest of valued goals, cope more effectively and show better outcomes. As opposed, people who appraise stress as threatening, and have beliefs that stress can be debilitating suboptimal in goal pursuit (Hagger et al., 2017).

It is proposed that, when people feature a stress-is-debilitating mindset, their arousal levels are likely to be hypo- or hyperactivated. Arousal levels may be hypoactive under stress as an impact of avoidance or denial of the stress or the use of counteractive coping mechanisms such as medications or substance use. Alternatively, arousal levels may be hyperactivated directly as a result of the additional stress that comes from having a stress-is-debilitating mindset or indirectly through counter-effective reactions of emotional suppression, experiential avoidance, or ruminative thought. Contrarily, people with stress is enhancing mindset, more likely to attain an optimal level of arousal when under stress, they have enough arousal needed to fulfil goals and demands but not exaggerated to debilitate physiological health at last. Researches also show that changes in mindsets can affect health through indirect changes in behavior and physiology (Crum et al., 2013).

A stress-is-enhancing mindset is parallel with an incremental perspective, such that individuals have a flexible perspective on stress and have beliefs that stress is an opportunity for growth with the potential to facilitate performance and functioning (Crum et al., 2013). In contrast, a stress-is debilitating mindset is more in line with an entity perspective such that people have a view that stress is harmful. A developing research has shown that people with stress-is-enhancing mindset experienced reduced physiological stress responses, greater positive affect and cognitive flexibility, better self-rated health, higher life satisfaction, and better academic and work performance (Crum et al., 2013). Furthermore, research in various situation has shown that a stress-is enhancing mindset can be induced through intervention and shown effective result in relieving highly stressful events (Crum et al., 2017, 2013; Keech et al., 2021).

Researchers stated that stress might be beneficial, at least up to a certain point. But once stress hits a critical point or allostatic load, it becomes debilitating (distress), pictured as an inverted-U-shaped curve represent the relationship between arousal and performance. The assumption that an objective level of stress predicts physical and psychological results largely has been obscured by the idea that responses to stress are driven by how people manage or anticipate the negative impacts of stress; in effect, how—and how well—they adapt (Crum et al., 2013).

These beliefs can be influenced or changed by an explicit message, or indirectly by other people's feedback (Dweck, 2006).

Coping preferences may grow out of meaning systems. Some beliefs and goals may help us to construct the lives we want and to maintain the flexibility to reconstruct them when things go wrong. Although most theories view coping as a process and resist thinking in term of traits and rigid coping styles, there has been identified more adaptive coping strategies that tend to be more mastery-oriented, active, and effective. They must adopt new goals, and they must learn new strategies for attaining their goals. Their successful adjustment depends on how well this is done (Dweck, 2000).

The hypothetical supporting the suggestion that stress mindset changes health and performance is that different stress mindsets will be associated with distinctive processes of motivational and physiological. Specifically, it is said that stress mindset has a significant impact on the manner in which stress is behaviorally approached as well as the manner in which stress is psychologically experienced which these short-term impacts on physiology and motivation have long-term impacts on health and performance outcomes (Crum et al., 2013). People with growth mindset tend to take more direct problem-solving approach, while those with fixed mindset tend to lost in negative feelings or turn away from the problem and try to make themselves feel better. Studies by Loeb & Dweck (1994) show a similar thing. When confronted with scenarios portraying them as victims, again, those with growth mindset reported that they would take a more active problem-solving stance, while those with fixed mindset showed more passive acceptance but admitted they would harbor long-term hatred and wishes of revenge.

More particularly, in case people has a stress-is-debilitating mindset, their primary motivation is to avoid or manage the stress, preventing it from becoming debilitating outcomes. On the other hand, when one has a stress-is-enhancing mindset, their primary motivation is to accept and utilize stress toward achieving enhanced outcomes. As such, in the event one has a stress is-debilitating mindset, one will be more likely to engage in actions and coping behaviors that act to avoid or manage the stress itself (in an effort to prevent debilitating outcomes from happening). On the other hand, if people have a stress-is-enhancing mindset, they will more likely engage in actions that help meet the demand, value, or goal underlying the stressful situation (Crum et al., 2013).

Psychological factors play an important role in the way in which people cope with the threat of pandemic infection and its sequelae. Although many people cope well under threat, many other people experience high levels of distress or a worsening of pre-existing psychological problems, such as anxiety disorders and other clinical conditions. Psychological factors are further important for understanding and managing broader societal problems associated with pandemics, such as factors involved in the spreading of excessive fear. People may fear for their health, safety, family, finances, or jobs. Psychological factors are also important for understanding and managing the potentially disruptive or maladaptive defensive reactions, such as increases in stigmatization and xenophobia that occur when people are threatened with infection (Taylor, 2019). If examined deeply, people behaviors during pandemic can be explained on the mindset perspective.

Several personality traits have been linked to the vulnerability to experience negative emotions in response to stressors. These traits are interrelated and transdiagnostic in that they are associated with a range of emotional problems (Kring & Sloan, 2010; Norton & Paulus, 2017). Every type describes people's behavior, but more importantly, is the psychological reasons for people's behavior – about the beliefs and goals people bring to a situation that caused them to act in certain ways (Dweck, 2000). Negative emotionality, also known as neuroticism, is the general tendency to become easily distressed by aversive stimuli. People who scored high on this trait tend to often experience aversive emotions such as anxiety, irritability, and depression in response to stressors (Costa & McCrae, 1987). Therefore, it is not surprising that the severity of a person's negative emotionality predicts their likelihood of becoming distressed by the threat of infection. They tend to overestimate of threat. People who score high on overestimation threat tend to overestimate the cost ("badness") and probability (likelihood) of aversive events, and see themselves as being especially vulnerable to threats (Frost & Steketee, 2020). The impact is they are likely to become highly worried and anxious because their estimates of being harmed tend to be inflated compared to the estimates of people scoring lower on these traits. The intolerance of uncertainty is another facet or sub-trait of trait anxiety that can contribute to the tendency to experience anxiety and fear (McEvoy & Mahoney, 2013). They have a strong desire for predictability. When faced with important uncertainties, these people might feel paralyzed with indecision (Birrell, Meares, Wilkinson, & Freeston, 2011). During the

pandemics, the intolerance of uncertainty is likely to be a particularly important contributor to pandemic-related anxiety and distress. During times of pandemics, people need to be able to tolerate or accept a certain degree of uncertainty. People who are unable or unwilling to accept uncertainty are likely to experience considerable distress. People with a high degree of intolerance of uncertainty tend to become highly anxious about the threat of infectious disease, especially if they perceive themselves as having limited control over the threat (Taha, Matheson, Cronin, & Anisman, 2014)

Unlike the above-mentioned traits, which are associated with negative beliefs or expectations, the unrealistic optimism bias is associated with persistent and unrealistically positive beliefs about one's future (Taylor & Brown, 1988). Optimism-defined as the hope that something good is going to happen (Carver, Scheier, & Segerstrom, 2010) can be a state variable or an enduring personality trait. Optimism trait, which is our focus here, is negatively correlated with negative emotionality, although the correlation is far from perfect (Kam & Meyer, 2012). Regardless of these theoretical debates, people scoring low on traits such as negative emotionality generally tend toward optimism. Many people, although the precise prevalence is unknown, have an unrealistic optimism bias (Makridakis & Moleskis, 2015). This is the strong tendency to believe that positive events are more likely to happen to themselves than to others, and that negative events are more likely to happen to other people than themselves. Such people tend to undervalue dangers such as diseases and other hardships, whose existence they accept but cannot believe will happen to themselves (Makridakis & Moleskis, 2015). People with strong unrealistic optimism bias tend to see themselves as impervious to infection (Ji, Zhang, Osborne, & Guan, 2004; Kim & Niederdeppe, 2013). In the event of a pandemic, the unrealistic optimism bias can have deleterious effects. It may lead people to underestimate their susceptibility to risk, thereby reducing attention to risk information and leading them to neglect to do preventive health behaviors such as seeking vaccination (Kim & Niederdeppe, 2013). The unrealistic optimism bias can be resistant to change in the face of disconfirming information (Sharot, Korn, & Dolan, 2011). Related to the unrealistic optimism bias is the sense of invulnerability. That is, the sense that one is unlikely to be affected by threats such as serious infectious disease. People with an inflated sense of invulnerability are (1) less likely to experience anxiety in response to stressful life events; (2) more likely to take up smoking or drug use; (3)

more likely to drink and drive; and (4) less likely to intend to seek vaccination, even for pandemics such as Swine flu (Taylor, 2019). During the next pandemic, people with strong unrealistic optimism bias or a strong sense of invulnerability will probably be less worried than other people and possibly more likely to spread infection by failing to seek vaccination and by neglecting to do basic hygiene behaviors such as hand washing.

Maybe the people with the growth mindset more likely to have expanded sees of their capacity and try for things they're not capable of? In truth, Researches show that people are terrible at estimating their abilities. But people with the fixed mindset who accounted for almost all the inaccuracy. The people with growth mindset were amazingly accurate (Dweck, 2017). Those with growth mindset, believe they can develop their selves, open to accurate information about their current abilities, even if it's unflattering. What's more, in case they're situated toward learning, they require exact information about their current abilities to learn effectively. However, if everything is either good news or bad news about their precious qualities—as it is with fixed mindset people—distortion almost inevitably enters the picture. Some outcomes are magnified, others are ignored, and before they realize it, they become unrealistic.

Health anxiety refers to the tendency to become alarmed by illness related stimuli, including but not limited to, illness related to infectious diseases. Health anxiety ranges on a continuum from mild to severe, and can be a state or a trait. The latter is a relatively enduring tendency. Our focus is on trait health anxiety. Some people have very low levels of health anxiety. Their lack of concern about health risks can be maladaptive (e.g., neglecting to take necessary health precautions). Excessively low health concerns can be associated with an unrealistic optimism bias, as discussed before. People who are unconcerned about infection tend to neglect to do recommended hygienic behaviors, such as washing their hands after using the washroom and tend to be nonadherent to social distancing (Taylor, 2019).

Excessively high health anxiety is characterized by undue anxiety or worry about one's health. That is, a disproportionate concern, given one's objective level of health. People with excessively high levels of health anxiety, compared to less anxious people, tend to become unduly alarmed by all kinds of perceived health threats, and overestimate the likelihood and seriousness of becoming ill (Hedman et al., 2016). Excessive health anxiety is associated with high levels of functional impairment and high levels of

health care service utilization, even after controlling for physical comorbidities (Bobevski, Clarke, & Meadows, 2016; Eilenberg, Frostholm, Schroder, Jensen, & Fink, 2015). Excessive health anxiety—as seen in psychiatric disorders such as hypochondriasis, illness anxiety disorder, and somatic symptom disorder is common, with an estimated lifetime prevalence of 6% in the community (Sunderland, Newby, & Andrews, 2013). People prone to excessive health anxiety are likely to become particularly anxious during a threatened or real epidemic or pandemic. Such people may misinterpret somatic stress reactions (e.g., sweating, hot flushes, increased muscle tension) as signs of infection. Furthermore, they can experience the nocebo effect, which occurs when negative expectations about treatment (e.g., a vaccination injection) cause the patient to experience negative side effects (Taylor, 2019). Traits such as negative emotionality (neuroticism) may predispose people to experience the nocebo effect (Data-Franco & Berk, 2013).

Interpretations of health-related stimuli are influenced by memory processes such as recollections of past experiences and by longstanding beliefs (Salkovskis & Warwick, 2001; Taylor & Asmundson, 2004). Learning experiences (e.g., experiences of being hospitalized as a child) can lead some people to mistakenly believe that their health is fragile (Taylor & Asmundson, 2004). People with excessive health anxiety tend to believe that all bodily sensations or bodily changes are potential signs of disease (Taylor & Asmundson, 2004) In the case of influenza, grossly inaccurate beliefs can contribute to excessive health anxiety. Such beliefs are unfortunately commonplace. Attentional processes are important cognitive factors in shaping the intensity of health anxiety (Norris & Marcus, 2014). People with excessive health anxiety tend to be hypervigilant to bodily changes and sensations; that is, they pay a lot of attention to their bodies and therefore are likely to notice benign bodily perturbations. This selective attention increases the odds of noticing bodily changes or sensations. The fear of infection led people to persistently focus on their bodies, leading many people to misinterpret benign bodily changes or sensations. Selective attention to bodily states is influenced not only by internal factors (i.e., sensations, beliefs, expectations), but also by external stimuli (Taylor, 2019)

People's interpretations influence whether or not they seek treatment, and whether they seek appropriate treatment. People can hold erroneous beliefs about what is an effective treatment Some

people believe that they only need symptomatic relief (e.g., cough suppressant medications), which may be insufficient if the underlying disease needs to be treated (Leventhal et al., 2016). People's appraisals of risk are often inaccurate. Indeed, there is only a weak correlation between people's anxiety about a particular risk and objective probability of death or harm (Frost, Frank, & Maibach, 1997; Young, Norman, & Humphreys, 2008). People with high levels of health anxiety sometimes regard clinics as a source of sickness rather than a resource for help. People with excessive anxiety about infection tend to engage in maladaptive safety behaviors (i.e., behaviors intended to keep themselves safe) such as excessive hand washing and repeatedly seeking reassurance from medical professionals. Excessive handwashing can impair functioning in other areas of life (e.g., occupational functioning), especially when people devote hours per day to unnecessary handwashing. Excessive reassurance-seeking (e.g., repeatedly and unnecessarily seeking assurances that one is not sick) can add an unnecessary burden on the healthcare system. Excessive reassurance-seeking can also perpetuate health anxiety because (1) it increases the risk that the person will obtain conflicting medical information, (2) increases the risk of iatrogenic interventions, and (3) reinforces the person's view that their health is at risk (Taylor, 2019). The latter can occur, for example, when unnecessary medical tests (e.g., laboratory tests) are given in an attempt to reassure the anxious patient. The testing can be misinterpreted by the patient. Reassurance-seeking can consist of persistent searching the Internet for medical information ("cyberchondria"; (Mathes, Norr, Allan, Albanese, & Schmidt, 2018), which increases the odds that the person will be exposed to alarming, false information (Taylor & Asmundson, 2004). People with excessive health anxiety also tend to engage in "doctor shopping"; that is, seeking consultations with multiple physicians so as to reassure themselves that they are not suffering from a serious disease. Doctor shopping places an undue burden on the medical system and increases the chances that the patient will receive seemingly conflicting or confusing medical advice (Taylor & Asmundson, 2004).

Beliefs and fears about diseases, just like diseases themselves, spread through social networks. Beliefs also influence the spread of infection. If there is widespread belief in the importance of handwashing, for example, then this will curtail the spread of disease. In general, beliefs and fears are spread in three main ways: (1) Information transmission, such as by media reports (e.g., text, images) or verbal

information received from other people (e.g., rumors); (2) direct personal experiences, including conditioning events (e.g., exposure to trauma); and (3) observational learning (e.g., witnessing other people acting frightened in response to some stimulus). Information transmission and observational learning are particularly relevant to the spread of beliefs and fears through social networks (Taylor, 2019).

A rumor, as the term is defined in the social sciences, refers to a "story or piece of information of unknown reliability that is passed from person to person. Rumors are "improvised news", spreading rapidly when the demand for information exceeds the supply, as is the case during times of uncertainty about important issues. Rumors may be spread if they help people make sense of an ambiguous situation, such as the possible threat of infection, and if rumors offer guidance about how to cope with the perceived risks (DiFonzo & Bordia, 2007). Rumors can arise from anonymous sources, causing uncertainty about the veracity of the information. Rumors can be spread maliciously and to promote prejudice.

Social media have become a major source of health information for people worldwide and have become a global platform for outbreak and health risk communication (Taylor, 2019). Social media are a two-edged sword. They can rapidly disseminate information and misinformation. They can fuel or quell fears, and they can influence the spreading of disease by influencing people's behavior. This potentially raises problems with the spreading of excessive fear. The same can be said for modern communication technologies in general, including the Internet. A large volume of misleading information is posted on social media. Research indicates, for example, that about 20-30% of You Tube videos about emerging infectious diseases contain inaccurate or misleading information (Tang et al., 2018).

Emotional contagion, including the spread of fear, is a basic building block of human interaction, allowing people to understand and share the feelings of others by "feeling themselves into" another person's emotions (Hatfield, Carpenter, & Rapson, 2014). Research shows that observational learning is an important way in which emotions, including fears, are spread (Bandura, 1986). Observational learning involves the acquisition of information, skills, or behavior by watching the performance of others. Fears may be acquired via observational learning, such as by seeing or hearing people express fear about some issue, such as a possible pandemic. Observational learning can include seeing fearful faces or bodily postures and hearing frightened voices.

Contemporary methods for managing pandemics are largely behavioral or educational interventions—that is, vaccination adherence programs, hygienic practices, and social distancing—in which psychological factors play a vital role. Excessive emotional distress associated with threatened or actual infection is a further issue of clinical and public health significance. Psychological factors are also relevant for understanding and addressing the socially disruptive behavioral patterns that can arise as a result of widespread, serious infection. Four main methods are used to manage the spread of infection: (1) Risk communication (public education), (2) vaccines and antiviral therapies, (3) hygiene practices, and (4) social distancing (WHO, 2008, 2012; World Health organization Writing Group, 2006). Psychological factors play an essential role in the success of each of these methods.

Pharmacological Treatments Vaccines and antiviral medications are the primary pharmacological methods for managing pandemic influenza. The development of vaccines for infectious diseases is a time consuming, costly business, with a more than 90% failure rate (Gouglas et al., 2018). Psychological factors, specifically mindset, are important for understanding seemingly self-defeating behaviors such as vaccination nonadherence (Taylor, 2019). In terms of influenza, people are unlikely to seek vaccination if they (1) believe (accurately or not) that they are unlikely to be exposed to an influenza virus, (2) see themselves as being impervious to infection, (3) do not perceive the infection to be a serious problem, (4) perceive that there are significant inconveniences or barriers to adherence, and (5) have misgivings about the safety and efficacy of vaccination (Taylor, 2019). People with very strong beliefs about negative side effects may refuse to be vaccinated even though they might also acknowledge that the infection is potentially dangerous. Vaccination hesitancy is a widespread, important problem, even among medical practitioners and even during times of pandemics. Various types of negative attitudes and other psychological factors appear to play a role, such as psychological reactance, PVD, and injection phobia. Treating the attitudinal and motivational roots of the problem may be vital during the pandemic. Public education campaigns show promise as do interventions targeting particular problems such as injection phobia. Mandatory vaccination as a requirement for employment may be viable for medical practitioners and workers in other sectors. It is unclear whether mandatory vaccination would be viable on a community-wide level (Taylor, 2019).

Hygiene Practices Commonly recommended hygiene practices include handwashing with soap or hand sanitizer, covering sneezes/coughs (e.g., sneezing into the crook of one's arm), hand awareness (i.e., refraining from touching one's eyes, nose or mouth), cleaning household surfaces, and wearing facemasks (WHO, 2008). Social Distancing refers to interventions, either recommended or mandated by health authorities, to reduce the probability that infected people will spread disease to others (Finkelstein, Prakash, Nigmatulina, Klaiman, & Larson, 2010). Social distancing can include some or all of the following, depending on the severity of an outbreak: Quarantine of infected persons, school closure, workplace closure, cancelling mass gatherings such as sporting events and concerts, closing recreational facilities (e.g., community centers), closing non-essential businesses (e.g., clubs and bars), cancelling non-essential domestic travel, self-imposed isolation of uninfected people (e.g., remaining home, when possible), and border and travel restrictions (World Health organization Writing Group, 2006). Mindset predict a person's proclivity to engage in the hygiene behaviors and social distancing necessary for pandemic control. Changing people's mindset through the communication message delivered communication guidelines are as follows: 1. Announce the outbreak early, even with incomplete information, so as to minimize the spread of rumors and misinformation. 2. Provide information about what the public can do to make themselves safer. 3. Maintain transparency to ensure public trust 4. Demonstrate that efforts are being made to understand the public's views and concerns about the outbreak. 5. Evaluate the impact of communication programs to ensure that the messages are being correctly understood and that the advice is being followed (WHO, 2005, 2008).

In the event of disaster such as a pandemic, a lack of mental health and social support systems and a lack of well-trained mental health professionals can increase the risk that people will develop emotional and other forms of psychological disorders (Taylor, 2019). A proactive response is required, involving a rapid assessment of outbreak-associated psychological stressors, for both civilians and medical practitioners. But even at the best of times, busy medical practitioners, such as primary care physicians, often fail to detect psychological disorders. The situation is even more challenging during a pandemic, where there is an increase in the number of sick people and likely staff shortages due to illness. Accordingly, there need to be efficient procedures for identifying people who are at risk for,

or actually suffering from, clinically significant distress. Procedures are also needed for selecting optimal interventions. The screen-and-treat method is one such approach (Taylor, 2019).

Psychological interventions can be useful in the early stages of a pandemic, when anticipatory anxiety and worry are likely to be high, and in later stages, especially where people are exposed to traumatic events such as witnessing the death of friends and loved ones. Psychological interventions can be useful even after the pandemic has passed.

Mindsets outline the running account that's taking put in people's heads. They guide the whole interpretation process. In several studies, we probed the way people with a fixed mindset dealt with information they were receiving. We found that they put a very strong evaluation on each and every piece of information. Something good led to a very strong positive label and something bad led to a very strong negative label. The fixed mindset creates an internal monologue that is focused on judging. Stronger beliefs in the negative effects of stress, instead of the positive effects of stress, were related with people's choice of emotional expression, which was in turn associated with higher levels of irritation anger (Horiuchi et al., 2018).

People with a growth mindset are too continuously observing what's going on, but their inside monologue is not about judging themselves and others in this way. Certainly, they're delicate to positive and negative information, but they're adjusted to its implications for learning and constructive action. With growth mindset, people can look more closely at the facts by asking: What is the evidence for and against your conclusion? People may also be encouraged to think of reasons of their failure, and these may further temper their negative judgment. In this way, people can get more realistic and have more optimistic judgments to deal with their situations in more adaptive ways and in turn generate more positive and effective results.

4 CONCLUSIONS

In terms of theoretical insight, this study provides results that mindset plays an important role in understanding and addressing the socially disruptive behavioral patterns that can arise as a result of widespread, serious infection. Mindset are also relevant for stress appraisals which will then determine individual's responses to stressors are adaptive and lead to effective coping, or maladaptive and lead to ineffective coping and compromised

health and functioning. Individuals with a growth mindset were more likely to appraise a potential stressor as challenging. These individuals were less likely to be stressed, more likely to report positive experiences, such as positive emotions, and use more approach and active coping when they encountered potentially stressful events. By contrast, individuals with fixed mindset were more stressed, reported negative experiences such as negative emotion, and tend to use avoidant coping in stressful events.

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