



Behavioral Reactions and Psychological Responses to 2019-nCoV: A Narrative Review

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Abstract

Context: The emerging 2019-nCoV outbreak has involved almost all countries worldwide. Although the timely dissemination of clear and accurate information on threats of the disease might cause panic, it is needed for rapid adoption and implementation of prevention and control measures. From the early stages of outbreaks, the behavioral responses and public risk perception should be carefully monitored for further policies and corrective measures.

Evidence Acquisition: In the current narrative review article, the psychological and behavioral responses are reviewed after an introduction to the risk perception and role of social and personal behavioral changes in the 2019-nCoV outbreak. Additionally, the impact of public perception on mental health problems and containment of the outbreak is discussed.

Results: The consequences of the outbreak affect both infected and non-infected people in communities. People may experience loneliness, fear of catching the disease, and loss of loved ones during the outbreak. The timely understanding of the situation, implementation of urgent psychological interventions, and emotional supports are necessary to encourage people to fight this long-term outbreak and prevent subsequent mental health problems.

Conclusions: High self-control and public perception can mediate the associated psychological impacts of stressful conditions in outbreaks.

Keywords: Awareness, Behavioral Change, Behavioral Reaction, Coronavirus, Mental Health Problem, Outbreak, Pandemic, Psychological, Risk Perception, 2019-nCoV

1. Context

The World Health Organization (WHO) characterized the 2019-nCoV outbreak as a Public Health Emergency of International Concern on 30, January 2020 (1). The novel coronavirus seems to be more sporadic than previous coronaviruses. However, some regions have exhibited more responsive personal and social behaviors due to the experiences of previous coronavirus outbreaks. This might be due to the realistic vision of the community to the disease and its transmission. The public perception and social and personal behavioral responses can determine the efficacy of control and prevention measures. The uncertainty about the transmission routes of 2019-nCoV disease and the unpredictability of how long the outbreak lasts can enhance public anxiety and concerns (2). Mental health problems are exacerbated by isolation and quarantine (3). Besides providing psychological counseling services such as telephone helplines, the National Health Commission

guidelines have provided the emergency psychological crisis interventions for people with 2019-nCoV (4). Given that there is no definitive treatment and vaccine for the 2019-nCoV disease, the dissemination of timely information related to the outbreak has a critical role in decreasing mental health problems and containment of the outbreak. Although much research has been conducted on the treatment of 2019-nCoV disease, minimal studies have paid attention to the psychological impacts of this disease (5).

2. Evidence Acquisition

For the current article, there were no restrictions on searching electronic databases. English databases such as Google Scholar, Scopus, Science Direct, Web of Science, and PubMed were explored by using appropriate keywords such as behavioral reactions, COVID-19, psychological response, etc. In this article, we reviewed the behavioral

reactions and psychological responses to the 2019-nCoV outbreak among the general population and health care workers. In addition, the psychological interventions and strategies to mitigate mental health problems due to the 2019-nCoV pandemic are reviewed.

3. Results

3.1. Psychological Responses to 2019-nCoV Disease

3.1.1. Psychological Responses in the General Population

It is unknown how many people may die or get infected by the 2019-nCoV disease and how long the outbreak lasts (6). Individuals who have 2019-nCoV may experience a range of psychological disorders even after they have been cured (7, 8). There are no therapeutic drugs and vaccines for the current novel coronavirus. This uncertainty and unpredictability can cause fear and disappointment. The fear of catching the disease and resentment regarding disclosure and loss of the loved ones due to 2019-nCoV may lead to emotional responses (9). The rapid spread of outbreaks and the fear of death cause anxiety and psychological disorders, including depression, posttraumatic stress, and substance dependence (10-12). As reported in several studies, posttraumatic stress increases in populations exposed to disasters (12). The psychological disorders due to disasters worsen by isolation, loneliness, helplessness, and loss of face-to-face connections (13, 14). Being in quarantine due to infection gives the feeling of shame and guilt (5). The uncertainty about the isolation period increases the non-compliance and can demoralize individuals (15). Prolonged isolation causes more mental health problems than short-time isolation (16, 17). Many people experience the fear of unemployment due to the economic downturn of the outbreak (18).

The implementation of precautionary measures associated with personal and social controlling behaviors such as isolation, staying home, and cleaning surfaces resulted in severe anxiety among Wuhan (32.7%) and Shanghai (78.6%) citizens during the early stages of the 2019-nCoV outbreak (19). Of 1,715 respondents from Hong Kong, 97% were worried, and 98% (slightly: 42%, greatly: 56%) stated that their routine lives were disrupted due to the 2019-nCoV outbreak (20). In another study on 2019-nCoV, from 1,210 Chinese respondents, 53.8%, 16.5%, 28.8%, and 8.1% were rated at the moderate to severe levels of psychological impacts, depressive symptoms, anxiety symptoms, and stress, respectively (21). Sleep, work, and other activities as routines are hindered or interrupted, which exacerbate the psychological and mental health consequences (22-24). In the 2019-nCoV outbreak, of 1,210 Chinese respondents, 84.7%, 75.2%, and 75.1% spent almost all their time at their

home (20 - 24 h), were worried about their family health and were satisfied with the related disseminated information, respectively (21). The feelings like cooperation and being part of a big group can result in the selfless contribution of people (25). For efficient cooperation, the role of individuals and groups of individuals and punishments of disobedience, such as social disapproval, should be clearly specified (26-28).

3.1.2. Psychological Responses in Health Care Workers

Medical employees are in close contact with infected people who experience respiratory syndromes. Although they do their best to cure the patients, sometimes they cannot save the patients' lives, and this results in the feeling of guilt for not being a good health worker (11). This situation of being in danger, stressful work for long hours, and heavy professional responsibilities can lead to posttraumatic stress symptoms of many hospital employees (11). These psychological disorders are enhanced in those who are single or with low household income (29). The health care workers fear of catching the disease and transmission to their families and loved ones, which can cause conflicts and dissonance (30). It has been reported that the healthcare workers in Intensive Care Units (ICU), emergency, and isolation wards are directly exposed to patients and are more likely to have adverse psychiatric disorders than other healthcare workers (31). In the SARS outbreak, 10% of the respondents (hospital employees) experienced high levels of posttraumatic stress symptoms. Those who were quarantined and their close friends and relatives were infected by SARS experienced the posttraumatic stress symptoms more than others (32). In 40% of the hospital employees who experienced high levels of posttraumatic stress symptoms, the symptoms persist three years after the outbreak (29). It has been reported that if posttraumatic stress symptoms remain six months after a disaster, they continue to remain for long periods (33).

Given that several factors influence the substance abuse or dependence, including income, gender, education level, age, etc. (34), individuals who are living in danger are prone to recurrent or prolonged disasters and are more likely to develop post-traumatic stress disorder and substance dependence (35).

3.2. Strategies to Improve Psychological Responses to 2019-nCoV Disease

The psychological interventions to tackle the mental health problems of 2019-nCoV disease should be implemented before serious issues occur (4). There are some points released by the WHO for the general population, which help in the prevention of mental health problems associated with the 2019-nCoV outbreak. Some of these

measures are as follows: (1) Those who have 2019-nCoV should be supported with kindness; (2) people who are being treated for 2019-nCoV should not be called as “victims”, “diseased”, or other inappropriate titles; (3) seeking medical advice and information regarding the outbreak at specific times (once or twice a day and not more) from trusted sources; (4) supporting others besides protecting yourself; (5) amplification of hopeful and positive images of those who have recovered from 2019-nCoV; (6) honoring health-care workers and medical employees who care people with 2019-nCoV while sacrificing their lives (1). The awareness of the new lifestyle and its detrimental consequences, maintaining social networks, teleworking, and home exercise programs help in compliance with loneliness and isolation (36-38).

The related psychological treatments depend on the severity of symptoms and the conditions the patients' experience (8). The implementation of psychological interventions such as cognitive behavior therapy (CBT) or mindfulness-based therapy (MBT), etc. might be affected by the shortage of professionals or multiple responsibilities of psychologists and psychiatrists (5). The MBT consists of relaxation techniques such as meditation practices, which prevent depression and alleviate stress, while CBT emphasizes stress management to decrease maladaptive coping (39-41). The psychologists and psychiatrists are often discouraged to enter the isolation wards or be in close contact with 2019-nCoV patients (8). The provision of relevant policies on training volunteers and mental healthcare workers and using online psychoeducation may solve this problem (4).

Some mental considerations for health care workers, according to the WHO guideline are as follows: (1) It is normal if health care workers feel being under pressure. Both mental and physical health should be maintained; (2) taking care in the best possible way; (3) keeping connection with beloved ones and others as much as possible; (4) disseminating the information to those who have cognitive, intellectual, and psychosocial disabilities in the best possible way, etc. (1).

The physical health of health care workers should be maintained through the implementation of preventive measures, such as providing personal protective equipment and facilities. Besides protecting the physical health of the front-line personnel, the psychological support for health care workers in terms of training the coping strategies and improving the emotional abilities should be provided by hospitals (11).

3.3. Behavioral Reactions to 2019-nCoV Disease

Behavioral responses have been dramatic during the rising phase of the 2019-nCoV outbreak (19). The behav-

ioral responses depend on physiological processes. The behavioral responses and the ways people respond to 2019-nCoV play an important role in the containment of the outbreak. Making decisions and testing the theories regarding the prevention and control measures should be based on behavioral responses, which are obtained by careful monitoring of the public from the early stage of the outbreak. These data are critical to evaluate strategies of public health communication and estimate the financial costs (42). Little is known about behavioral responses to outbreaks and the ways that behavioral responses affect the epidemiology of disease and economic repercussions (43).

In a study to examine behavioral responses to the SARS outbreak, respondents were asked about recent avoidance and recommended behaviors. The results showed that people with higher anxiety and perceived risks were more likely to carry out all avoidance and recommended behaviors (19). In another study to examine behavioral responses of air travelers to pandemic influenza, people responded to risks by behavioral changes (42).

3.4. Factors Affecting Personal and Social Behavioral Reactions to 2019-nCoV

3.4.1. General Public Perceptions

In outbreaks, public perception is important to shape behavioral responses and motivate people to adopt behavioral changes (44). The knowledge about the public perception of outbreaks is helpful in identifying the best way of encouraging personal and social controlling behaviors (45). The risk perception might lead to voluntary engagement in the implementation of behaviors (20). The public perceptions about the spread have shown discrepancies across Chinese cities. For example, the population in Wuhan as the epicenter of the outbreak showed higher public awareness (46). The perception of the severity and risk of catching the disease and truthiness of information disseminated by authorities has a major role in anxiety and populations' willingness to change their behaviors (45). The timely dissemination of transparent and accurate data on the number of infected and new cases leads to better adoption of prevention and control measures (47).

The population in unaffected areas may be well aware of the outbreak. In the Netherlands as an unaffected area, 99.6% and 91.2% of the respondents (n = 500) have heard about SARS and the associated pneumonia, respectively (48). The extent of emotional experiences varies between individuals, and everyone elicits a different degree according to the situation (49). For example, in the influenza, A H1N1v outbreak, only 10% - 30% of people were worried about catching the virus (50). The risk perception may differ by gender and level of education (51). Women and ru-

ral participants showed higher degrees of fear and anxiety during the 2019-nCoV outbreak (11).

The risk perception might be biased, if it is downplayed, the behavioral responses will be undermined and if it is overstated there will be a load of costs for economic and social aspects. Therefore, the governments or authorities should disseminate the risk of the 2019-nCoV outbreak as it really is (36). This trueness gives people trust and evokes a sense of public cooperation. The way people behave and respond in outbreaks is much related to their risk perception (52, 53). They tend to receive validated and clear information about the risk of deciding how to behave (36, 54, 55). However, there is uncertainty on how people perceive the risk. For example, afraid and angry people are more likely to have increased and decreased perception of risks, respectively (56, 57).

The behavioral responses to the newfound outbreak might be affected by public distress regarding the mortality rate and curability of the disease (47). The contradicted information released by a series of guidelines may confuse the reliability of the information. Cooperation in implementing the prevention and control measures requires the dissemination of validated information. The unclear, late, and inaccurate information about the spread of disease might lead to a lack of trust, misinformation, and hoarding. The misinformation due to a delay in the dissemination of accurate information causes fear responses (58). Besides these consequences of misinformation, the fear of 2019-nCoV infection has led to mutual discrimination between societies such as Chinese and Asian ones and has affected cross-national trades (59). The rumors about the origin of 2019-nCoV resulted in fear-mongering and racism. Chinese people who were living in other countries but had no connection with China were the first victims of this racism (58). Although no one wants the spread of disease, and there are more connections compared to previous coronavirus outbreaks, the fear and stigma might lead to some misinformation about the spread and communication (60). These rumors, perceptions, and behaviors should be responded to by official authorities or scientific centers (58).

3.4.2. Self-Control

Self-control can be defined as self-regulation and effortful executive control or conscientiousness (61). High self-control individuals can better regulate their emotions and behaviors regarding mental, physical, financial, and occupational issues to attain long-term goals (62). The psychological symptoms such as general distress, depression, and anxiety are negatively correlated with self-control (63). Self-control mediates the negative appraisal and mental health problems associated with the 2019-nCoV outbreak.

Individuals with higher self-control are less vulnerable to psychological disorders and mental health problems of disasters such as outbreaks. Low self-control people are in more need of psychological aids after the 2019-nCoV outbreak (14).

3.4.3. Stages of Spread

The dissemination of clear and updated information in the stages of the spread of the SARS outbreak resulted in different psychological and behavioral responses. The perception and behavioral changes of 1,397 Hong Kong residents (18 - 60 years) during the SARS outbreak were studied during the outbreak stages. In this article, the implementation of avoidance measures such as avoiding public places and public transit was associated with the phases of the outbreak. April 1, 2003, was considered the peak day for the SARS contradiction. The perceived efficacy about avoiding crowded places was increased at the first phase (before April 1) and decreased at the second phase (after April 1) of the outbreak. However, the perceived efficacy about implementing the hygiene measures such as wearing masks and hand hygiene was high in both phases (47).

3.4.4. Government Practices

The authorities are responsible for the dissemination of accurate information about the outbreaks and associated risks. Furthermore, the government is responsible for raising public awareness and making decisions about preventive and control measures such as strict quarantine and isolation, control of transmission, surveillance, etc. Providing timely and validated information helps in making better decisions based on the information perceived. The feedback on behavioral changes and public perception has an important role in determining further decisions and measures. The government and policymakers should consider that the dissemination of relevant outbreak data to the public is not a threat to the country, and this information help in public perception and better behavioral responses (47). The authorities are responsible for the dissemination of accurate information about the outbreaks and associated risks.

4. Conclusions

There is uncertainty about the duration of the outbreak, the accuracy of the information, and statistical reports of the newfound spread, which leads to panic, confusion, and misunderstanding. There is no effective drug and vaccine for the 2019-nCoV disease. People experience the fear of catching the disease, dying, and loss of loved ones during the current outbreak. The loneliness, helplessness, and financial loss can exacerbate the conditions in

isolation. Decision-makers should take prompt measures regarding the provision of preventive psychological interventions to cope with psychological disorders and mental health problems particularly in high-risk groups such as health care workers and those who have been quarantined or isolated. The emotional support of psychological professionals and the dissemination of adequate updated information appease the anxiety and emotion of society. If there is no trust providing the information backfires, the emotion of people can be easily affected by the panic of loneliness and death. Therefore, raising the public awareness of the spread statistics and transmission is a crucial factor in shaping the behavioral responses and perception. In this way, people can adopt the hard situation of the 2019-nCoV outbreak and continue to fight and implement behavioral changes.

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Footnotes

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