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REVIEW ARTICLE

Psychological Impacts of COVID-19 Pandemic

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Thousands of millions of people faced devastating impacts around the world during COVID-19 pandemic. Not only anxiety or fear of COVID-19 dominated the negative psychological impacts, mental disorders such as depression, posttraumatic stress disorder, and sleep disturbance increasingly appeared during or after the pandemic. Apart from the confirmed patients, survivors of the viral infection, close family members, elders, children and adolescents, people quarantined, people with preexisting psychiatric conditions, frontline police, emergency medical services, and health-care workers, mental distress specific to the vulnerable groups should be recognized. Preventive strategies including self-regulations, leadership, and teamwork were highlighted. Specific evaluations for at-risk population and efficacious treatment such as cognitive behavioral treatment could be considered. This article delineated directions for mental health workers during pandemic.

Key words: Psychological impacts, COVID-19, pandemic

INTRODUCTION

The coronavirus 2019 (COVID-19) pandemic has posed enormous challenges and impacts in many aspects to people all over the world. To date, 230 million confirmed cases and 4.72 million deaths worldwide have been reported.[1] The outbreak not only influenced the day-to-day life but also almost paralyzed health-care system in some of the severely affected countries. Taiwan successfully contained the infection spread in 2020 by taking measures of stringent quarantine, rigorous contact tracing, enforced quarantine of all close contacts, social distancing, handwashing, and mandatory use of face masks.[2] However, Taiwan has also experienced the COVID-19 surge and related impacts since May 2021.

Among the various aspects of influences, psychological distress was especially noticed under such a stressful disaster.[3] Impacts from a disaster consisted of the catastrophe itself, effects of media coverage, and vulnerability of the individual affected by the event.[4] Prevalence of patterns and severities of impacts varied is by different identities, including patients diagnosed with COVID-19, people who were quarantined, the deceased family, the police officers, emergency medical services, and even frontline health-care workers.[5,6] The current review would explore mental impacts in COVID-19 pandemic, core symptoms, and most importantly feasible managements and suggestions for psychological support systems needed.

PSYCHOLOGICAL IMPACTS OF COVID-19 PANDEMIC

Risk populations and prevalence

The prevalence of mental disorders varied in different diagnoses. Last time, Taiwan encountered such a devastating natural disaster might be traced to Chi-Chi earthquake, 1999, or severe acute respiratory syndrome (SARS) pandemic, 2003. Prior studies had showed that posttraumatic stress symptoms or depression dominating the major mental impacts in disasters are mentioned above.[4,7] Nevertheless, to our surprise, according to a previous survey of epidemiology during COVID-19 pandemic, the highest prevalence of psychiatric distress in the general population was anxiety (47%), much more than depressive symptoms (45%).[8-10] Groups at higher

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risks of psychological morbidities include health-care professionals, individuals who had been exposed to traumatic events, people with preexisting psychopathology, and others. Among medical staff, the group of highest risk was those who working inpatient physical health settings. Apart from higher frequency of exposure to virus and higher viral load in the workplace, increasing workload, doing higher risk procedures, and low availability of necessary personal protective equipment were all possible risk factors. Other workers were also exposed to the same risk and fear of contagion, such as the police, postal carriers, emergency medical technicians, or trash collectors. This group was especially vulnerable to anxiety or fear symptoms.[8]

However, except anxiety and depression, the prevalence of posttraumatic stress symptoms was also high, and about one in every ten individuals of the general population experienced these symptoms in the outbreak.[11] For people who had been exposed to traumatic events, the most prevalent symptom was posttraumatic stress symptoms months after the pandemic. Since there would be life events such as loss of a loved one, threats to their health directly occur to them. Depression or complicated grief disorder might also be seen. Another susceptible group was those who with existed psychiatric problems, especially severe and complex ones. Isolation or social distancing might exacerbate preexisting conditions throughout the pandemic period.[8,12]

Challenges from the pandemic

Although the importance of maintaining mental health in COVID-19 pandemic had been raised concerns, there were still several major challenges. One was that the health-care system might be deficient in materials and human resources. Psychological interventions were necessary in pandemic but might not be feasible due to the lack of digital devices. Furthermore, not all the mental health professionals were familiar with approaches of emergency or disaster psychiatry. Another was that the outbreak's aftermath of psychological impacts was underestimated in societies. Resources for people seeking assistance were also limited. In addition, organization and proposal of all psychological intervention resources were lacked. Different professionals had difficulty in coordinating with each other providing mental health resources to the public. Last but not least, related policy, qualified staff, and evidence-based plan were not provided immediately due to restriction of time. Coverage of public mental health resources remained deficient.[13] Most preventive psychological interventions were delivered by nongovernmental organizations as goodwill. These were all issues to be solved during the pandemic.[8]

EVALUATION AND INTERVENTION

Fear: Core symptom during pandemic

As mentioned above, anxiety and depression seemed to be the main psychological distress among medical staff in the time of COVID-19. However, what actually was the core issue behind the superficial discomfort and stress? Investigations into personal stress of intensive care unit members providing direct COVID-19 patient care reported that the most stressful issue for nurses was potential viral transmission toward their families. To clinicians, exposure to confirmed cases were mostly concerned.[14] Fear was an adaptive emotion mobilizing energy dealing with potential threats. Stress from fear seemed to be universal during pandemic. People's fear of COVID-19 could be related to different topics, including danger of contamination, economic consequences, compulsive behaviors such as checking or seeking reassurance, and traumatic stress symptoms as well.[15] Fear of COVID-19 could also predict posttraumatic stress symptomology. Meanwhile, posttraumatic stress symptoms could serve as a mediator between fear of COVID-19 and preventive health behaviors, promoting better results of health.[16] Specific evaluation tools over multiple aspects including anxiety, attitude, phobia, perception, stress, and distress were developed accordingly. COVID-19 Anxiety Scale, COVID-19 Peritraumatic Distress Index, and Fear of Coronavirus-19 Scale were instances.[17] In terms of fear assessment, the affected degree of one's daily life would be examined to see if the fear had only caused ego-dystonic thoughts or further responsive behaviors and change of lifestyle.[18]

Psychological impacts on specific groups

The psychological impact might also vary on different groups. Quarantine was the most efficient way for COVID-19 contagion prevention without vaccines or other specific treatments. Yet, quarantine was also one of the psychological stressors in the pandemic. For those who were quarantined, negative emotions including posttraumatic stress symptoms, confusion, and anger. Long-term effects post quarantine might last months. Especially in medical staff, alcohol use, avoidance behaviors (e. g. avoidance from people sneezing or coughing, crowd or all public spaces), and other behavioral changes such as vigilant handwashing were examples. It might take a few months for returning to normality. It was suggested that volunteerism of isolation could reduce the psychological distress and that self-isolating should be praised by the government in public to positively reinforce altruistic behaviors. During the process, brief yet clear instructions, ways of bidirectional communications, and basic supplies should be ensured.[19]

Isolation and social distancing indeed brought some psychological impacts to the general population. Vulnerable

groups with restricted capacity were especially concerned. Since the mortality rate was higher in a group of elders, death anxiety was particularly experienced by them during pandemic, and it might, in turn, worsen their anxiety-related symptoms because existential distress was the root of human capacity for anxiety.[20] In addition, social disconnectedness had worsened older people's mental health and even overall health outcome. Technological approaches were expected to solve problems with safety protocol kept under the pandemic, such as smartphone or video use for connection and support and telehealth.[21] Physical exercise and regular activity were suggested to be kept, not only for controlling underlying psychiatric diseases but also for maintaining their familiar lifestyle and quality of life.[22,23]

As for the group of youth, 38% of people aged from 16 to 25 years old were found meeting the criteria of moderate-to-severe psychological distress.[24] During lockdown, the incidence of domestic violence, abuse, and harm would be higher. However, the report rate became conversely less due to school or legal services not functioning fully as usual.[25] Furthermore, for children and adolescents, distance education had become inevitable due to school closure for curbing viral spread since the pandemic. However, peer interactions and psychological counseling resources usually provided by the school were also not available meantime, leading to higher risks of anxiety and depression for them. Experienced competencies could lead to positive emotions and intrinsic learning motivation and, in turn, enhance engagement and persistence of learning behaviors. The role of perceived relatedness was highlighted for future design of online learning.[26] Aside from mood disturbance, there would be another issue of difficulty in maintaining attention when learning at home. The attention span online would even be shorter than face-to-face sessions.[27] Personal attention was suggested to be provided to students to help retaining their attention.[28] Turning on the camera was encouraged; however, it would not always be feasible since not everyone had his or her own private space. It was also suggested to give students breaks within longer classes.[29] These methods were recommended to help addressing attentions and thus enhance learning efficacy during online learning. Problematic smartphone or Internet use, such as overuse of social media and aimless surfing on the Internet, might happen during the process.[30]

Some of psychological effects would particularly happen to specific occupation groups. Among health-care workers, burnout syndrome was one of the problems. Extended working hours and reduced level of motivation toward job might lead to reduced productivity. In intensive care units, higher risk and higher mortality might cause lack of personal accomplishment and lower job satisfaction.[31] Besides high workload and job stress, limited organizational support such as childcare, temporal housing for workers in high-risk areas (e.g., COVID-19 special ward), and time pressure, especially in emergency rooms, were risk factors of burnout in health care.[32] Posttraumatic stress symptoms were also common in medical staff, especially groups of young age, low work experience, female gender, heavy workload, working in unsafe settings, and lack of training and social support.[33] Access to updated information and structured training could help reducing anxiety, unproductive information seeking, and emotional distress. National or regional disaster mitigation plans should also be prepared for rapid response and massive resource demands.[34]

Regarding migrant workers, financial difficulty, lack of social support, uncertainty about future and job, quarantine, and being stigmatized could all result in psychological stress. People might generally think that foreigners would have a chance of being infected with COVID-19 and should stay away from them. Caregivers working and living in their employers' houses might be restricted from going out on holidays. Ways for relieving conflicts from interpersonal relationships became fewer. Problems-oriented strategies, staying connected with their family, seeking social support from owners, and self-help thoughts might be helpful.[35,36] Almost the same rules were recommended by the International Organization for Migration, UN, beyond boundaries of countries.[37]

People with preexisting psychological conditions were much more mentally vulnerable groups in the pandemic. In a case–control study, psychiatric patients were proved to have higher risks of higher levels of symptoms of posttraumatic stress disorder, depression, anxiety, stress and insomnia, worrying thoughts about physical health, anger, irritability, and suicidal ideation in contrast to healthy controls.[38] According to a multi-country study across completely different cultures of Israel, Germany, and India, personality traits with neuroticism might be associated with depression during waves of COVID-19.[39]

Psychiatric symptoms in COVID-19 patients: Cause and effect?

Does preexisting psychiatric disorder cause patients much more susceptible to COVID-19 infection? The relationship might be bidirectional. Some of the previous studies indicated that a prior psychiatric diagnosis was associated with a higher incidence COVID-19 infection.[40,41] In contrast, survivors of COVID-19 in the following 14–90 days were at higher risk of developing psychiatric disorders. The incidence of overall psychiatric diagnosis was 18.1%, the first psychiatric diagnosis was 5.8%. The hazard ratio was especially higher in anxiety, insomnia, and dementia.[41,42] As for the morality

rate after being infected with coronavirus-19, the overall mortality rate was higher in a group of psychiatric patients.[43] However, according to another retrospective cohort study, the mortality rate was highest in schizophrenia patients, whereas no association was found between the mortality rate of COVID-19 with mood and anxiety disorders. Previous studies had shown that the all-cause mortality rate of schizophrenia patients was the highest. Furthermore, immune dysregulation in this group was speculated to be one of the reasons behind susceptibility.[44]

Despite the vulnerable characteristics of psychiatric patients, the coronavirus-19 could also cause central nervous system involvement and resulting neuropsychiatric symptoms. Not only neurological symptoms such as headache, dizziness, altered consciousness, disorientation, stroke, seizure, and insomnia but also psychiatric symptoms such as anxiety, mood symptoms, and suicide ideations were possible.[45,46] Researchers worldwide had tried either gross or microscopic brain autopsy of deceased patients for pathological exploration since the outbreak. A potential mechanism explaining the relationship between COVID-19 infection with neuropsychiatric manifestations, called NeuroCovid Stage, was proposed. Throughout the three stages, coronavirus-19 caused cytokine storms from local areas such as nasal and gustatory epithelial cells, to systematic blood vessels. Blood clot would be formed in the brain and auto-antibodies wound damage the peripheral nerves and muscle. Ultimately, the cytokine would force an explosive inflammatory response, by which the blood–brain barrier would be damaged. The virus would invade into the brain, causing subsequent neuropsychiatric symptoms.[47] Invasion of the virus into blood–brain barrier was also supported by evidence from histopathological examination of COVID-19 patients' brain tissue, showing infiltration by CD68+ monocytes/macrophages and CD3+ T lymphocytes in the parenchyma.[48] There were also immunostaining using CD45 as a marker, *in situ* hybridization (ISH), targeted quantitative reverse transcriptase–polymerase chain reaction, and transmission electron microscopy.[49]

INTERVENTIONS

New era of digitalization during pandemic

Due to the concern of contagion, many digital devices were applied during the pandemic. Online questionnaires were utilized globally, especially in the field of psychiatry. However, we should be aware of some limitations including sample generalizability to generation and population bias since the online survey could only reach people who had access to the Internet.[50] Telemedicine and telepsychiatry were even more broadly used. However, patients with diminished cognitive capacity or less technologically literate would be not that suitable for operating the devices on their own. Data security, audibility, and visibility in practice would all be the concerns.[51] Regulations of telepsychiatry differed around the world. Some of the restrictions had been relaxed during pandemic in majorities of countries. Potential issues about access to groups lack of technology, patients' adherence, adaptation of health-care professionals, and future expansion should still be taken into consideration.[52]

Psychological interventions

Fear was the core psychological issues during the pandemic. Symptoms severity and frequency were emphases of assessment. Besides somatic symptoms such as palpitation or hands tremor, fear was also composed of uncontrollable worry. Various kinds of psychological interventions, psychotherapy had been used in victims of previous disasters. However, different kinds of psychotherapy might have its own treatment orientation and focus. For example, while interpersonal-oriented psychotherapy focused on one's interpersonal behavior patterns, cognitive behavioral therapy was rather goal directed, concentrating on one's distorted thoughts, hoping to integrate one's emotion and thoughts into rational thinking. Cognitive-behavioral therapy served as the first-line treatment to anxiety disorder[53] and therefore seemed to be appropriate treatment to fear response, especially when medical resources were not that convenient during pandemic. Several online programs for self-regulation were developed during the time of COVID-19. Psychoeducation about stress model and cognitive reconstructing was important. Useful behaviors such as problem solving and relaxation during highly stressful situations would be taught. Skills of mindfulness or acceptance, engagements in valued actions, nd self-compassion were all helpful sessions for individuals developing new stress coping strategies.[54]

Resilience

Psychological resilience is defined as the ability to bounce back when confronted with new, negative situations.[55] Considering the statistics among survivors and frontline medical staff in SARS or Chi-Chi earthquake, the prevalence of substance use disorder, mood disorder, and posttraumatic stress disorder might be elevated after the pandemic.[4,7,56] There were also studies investigating the mental outcomes of survivors of the coronavirus. Moreover, psychiatric symptoms might be the tough problems COVID-19 survivors faced during the first 12 months after hospital discharge.[57] Fair social supports, keeping daily activities or exercise, spiritual health, and positive appraisal style were all factors associated with good resilience major sociodemographic categories.[58,59]

Moreover, benefits might be self-perceived after such a traumatic event, leading to posttraumatic growth. Belief about a good world, openness to the future and identification with humanity might facilitate the growth.[60] Further preventive measures can be considered.

Recommendations for self-regulation

It was normal to feel distress or inconvenience during the pandemic. There were some methods for facilitating individuals' resilience. Maintaining personal physical health and mental health were both vital. Adequate sleep, eating healthy, physical activity, and relax would be helpful. Avoidance of substance or excessive alcohol was necessary. Prolonged screen time associated with psychological strain had been noticed in the pandemic. A previous study showed that seven times per day and 2.5 h of media exposure could mark the difference between mild and moderate symptoms of anxiety and depression.[61] Limited screen time and moderate news consumption were therefore suggested. Staying structured daily routines, keeping oneself busy at work or trivial matters in everyday life, and listing tasks in order of priority could stabilize the mind. Maintenance of social connection was indeed also essential. In addition, providing help to others could buffering the negative effect from stress and facilitate mental health of the helper.[62] Most importantly, it is not shameful seeking help from others. When feeling uncontrolled and strong negative emotions, feeling difficulty in concentrating on current tasks, feeling struggle on daily chores, contacting a loved one, someone in the same faith community, or even employee assistance program in the company would be acceptable. Seek assistance from mental health professionals when self-harm or suicide ideation is noticed.

The importance of leadership and teamwork

Despite individual efforts, fair working system could facilitate better outcomes of both patient safety and stability of health-care professionals. Sufficient material supplies, appropriate task assignments, effective communications, emotional support for employers, and seeking out and integration of resources and workforce all relied on successful leadership with adequate knowledge, skills, experiences, and decisiveness for rapid response.[63,64] Characteristics of leadership played a vital role indeed. However, during the pandemic, disruption of clinicians' identities and relationships to some degrees could be anticipated. Conflicts, mistrust, divided working environment, and resulting impaired well-being of clinicians were possibly seen.[65] Teamwork capacity and how to collaborate with others would be therefore rather important issues.

CONCLUSION

The COVID-19 pandemic has caused significant impacts on mental health for 1½ a year. Fear over existential threats posed the core factor behind the psychological stress. Related mental impacts differed from different groups of populations. Distress of general populations and frontline health-care workers should all be taken into account. For better resilience to the pandemic and even postpandemic adaptation to "the new normal life" living with COVID-19, both efforts from individual regulations and systematic measures will be needed. Future research will be warranted after vaccination coverage is elevated and subsequent reopening.

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Conflicts of interest

There are no conflicts of interest.

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