

Investigation of Emerging Social and Psychological Behaviours due to Covid-19 using the Mouse Experiment

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Abstract: Every plague outbreak epidemic produces observable social, as well as psychological behavior, and this includes the COVID-19 pandemic. The coronavirus outbreaks can cause social panic and even their negative effects can lead to psychological disorders and social problems in some populations, and the populations involved here are not only the general public and patients, but also include psychological disorders in medical personnel. These negative effects include many factors, such as the degree of development in different regions, the government's isolation policy, the spread of social media, the promotion of online medical services and so on. On the other hand, we can use mouse experiments to observe changes in biosocial behavior in response to environmental changes, and the experimental results can be linked to social as well as psychological behavioral changes in human society, and the social effects observed from mouse experiments are related to individual behavioral changes due to significant psychological burdens in global health crises such as pandemics. Also, in the broader context of a novel coronavirus outbreak, the overall impact of the pandemic, the relative online remedies and effects, and the legacy of the novel coronavirus on society and the extent to which it affects the interrelationships of people in society are assessed.

1. Introduction

The emergence of the coronavirus pandemic in the last quarter of 2019 took the world by storm. When the medical fraternities had not yet known the potential adversities of the deadly virus, its effects on people were already evident in China in early 2019 (Cao et al., 2020). The virus rapidly spread from the Asian country to nearly the entire world within less than four months. Governments implemented measures to restrict cross-border movement and activities that could lead to a faster spread of the virus. However, the global pandemic still formed. The world faced life challenges that was comparable with influenza in 1918.

News media and other information outlet sources have been significantly covering the situation of the coronavirus pandemic from across the globe. However, A significant percentage of this news has portrayed the negative influences of the pandemic. Nevertheless, the negativity of the pandemic is the case due to the effect it brings to the community (Roy et al., 2020). Precautionary measures implemented by different governments across the globe have led to restrictions that spell negative energy on people in society. The coronavirus pandemic has portrayed the world as a wrong place for most people sending bad behaviour. The pandemic has made life mysterious on top of the Misery that people have been undergoing, especially those living in developing countries.

The emergence of the Coronavirus pandemic has brought more negativity on society due to the loss of jobs and other challenges that people have faced (Wilson et al., 2020). Many countries are showing signs of economic downturn. The societies have experienced greater pressure due to the pandemic, adding to the existing vulnerability, poverty, and hunger in many places. The social and psychological behaviour formed under this situation can be explained by the famous Mouse experiment conducted by Tyson in 1940.

To study the changes in people's social and psychological behaviour under quarantine policy, Zhen Yan and his team conducted a series of mouse experiments at University at Buffalo, the State University of New York. The experiment was used to investigate human beings' social and psychological behaviour in case of a change in the environment (Zhen Yan et al., 2021). The behaviour

exhibited by the mice in the experiment is parallel to that of humans in ordinary society. According to their observation from the experiment, when mice were exposed to a larger population with unusual variations, they tended to care less about what should happen in ordinary life and different genders show different tendencies. The emergence of the pandemic portrays the same impacts to human beings. When making difficult decisions, behavioural and psychological factors can impact the decisions we make. Its effects are living people with difficult choices to make, however critical they sometimes are. Scholars studied relate the social effects observed from the mouse experimental to the behaviour changes on individual due to significant psychological burdens during a global health crisis such as pandemic. The pandemic is considered to function as a main stressor.

This paper explored the emerging psychological and social behaviours because of the coronavirus pandemic. Multiple researchers reviewed this topic critically to unveil the relationship between coronavirus pandemic and effect on social and psychological health. Opinion-based conclusions and recommendations are provided at the end of the paper. They give a clear view of the social and psychological impacts of the pandemic in line with the investigation of this paper.

2. Review of the Background Literature

Research by Saladino et al. in 2020 has portrayed several psychological and social outcomes of the pandemic. According to their findings, the coronavirus pandemic has caused positive and negative effects on society regarding public health. The most exposed groups to the pandemic are likely to develop depression, anxiety, and post-traumatic stress disorders. It is a potential negative impact of the pandemic on the exposed groups. Individuals have also lost empathy due to implementing security and social distancing measures in different communities.

2.1 The Mouse Experiment

In the experiment to determine the social behaviour of organisms, the researcher designed the mouse experiment using healthy mice in an altered environment. They anaesthetised the mice to place an electrode device in the brain of each mouse. The device assisted in monitoring and adjusting firing activity of neurons in the brain. The researchers then used a single-cage feeding model to simulate social isolation, in which female and male mice at the age of 3 weeks of puberty were reared in a single cage for five weeks. The researchers observed the behaviour of mice by activating and inhibiting the firing activity of neurons in the Medial prefrontal cortex (mPFC) brain region of mice/ From the experiment, it was found that when the mice were in a state of social isolation, the firing activity of neurons in their mPFC brain region decreased significantly. This resulted the aggressiveness of male mice increased evidently, while female mice showed obvious social phobia.(Zhen Yan et al., 2021). This is indicated in Figure 1 below.

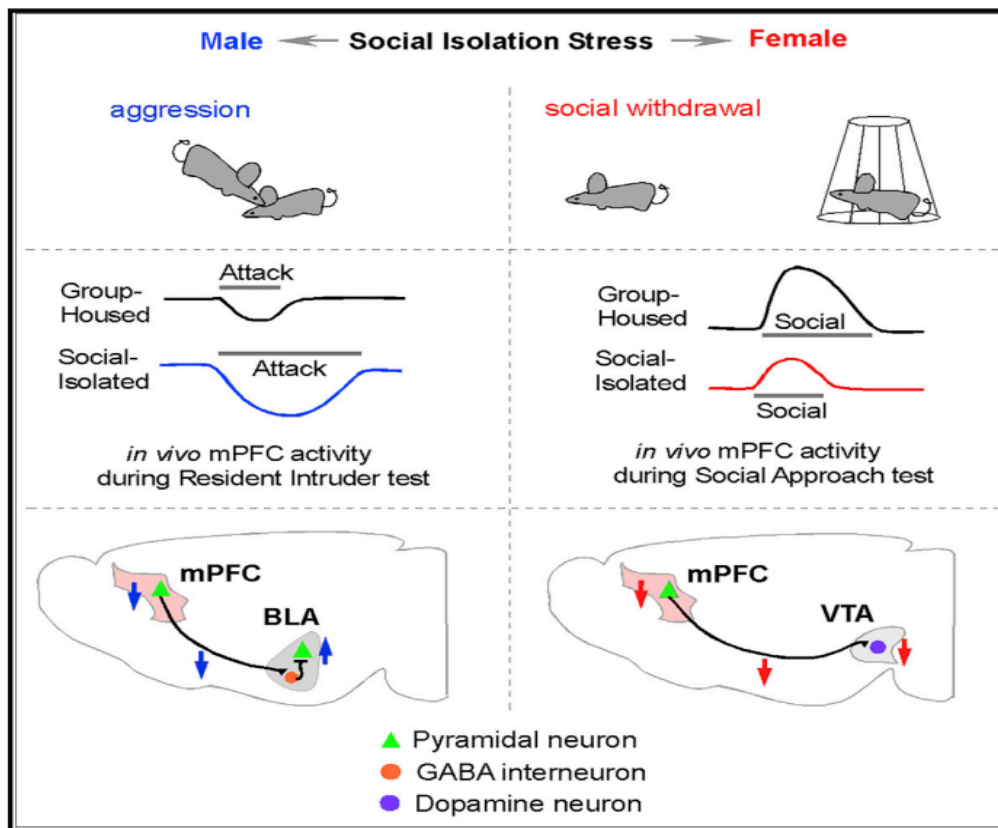


Figure 1. Social Isolation Stress and Mice Behaviour. Source: Zhen Yan et al., 2021

The findings from the experiment showed that stress and psychological burdens could impact the behaviour and psychological states of an individual due to significant psychological burdens during coronavirus pandemic. This could indicate gradually increasing of negative behaviours or anti-social behaviours such self-centeredness and outcast behaviours in society leading during the pandemic, which would result negative impact society in terms of social and psychological aspects.

As a result, the findings from the mouse experiments are helpful and critical in understanding the impact of the coronavirus pandemic to the society. The behaviours and psychological changes observed from the mouse experimental could indicate that the similar behaviour changes on individual impacted by the pandemic.

2.1.1 Fear of Contagion

Likewise, referring to the study of other past pandemics like Ebola and H1N1, the emergence of the coronavirus pandemic brought a lot of fear among people, which led to the introduction of quarantine. Observations of Saladino et al.'s (2020) research show that individuals express fear of contracting the disease, leading to the strict observation of quarantine rules. Although the practice is carried out to prevent the spread of the virus, people are losing the connection and empathy even to their loved ones leading to separation. The nature of the virus exacerbates the situation since it is difficult to ascertain whether an individual has contacted it. These feelings gradually need to be the feelings among individuals, such as anger and loneliness. Saladino et al. (2020) take note of increased suicidal cases among individuals due to such feelings. People coming from the most affected areas exhibits Suicidal behaviours, which are attributed to anger and stress.

2.1.2 Mental Disorders

Mental health problems are also in the rise due to the pandemic, according to the findings of Saladino et al. (2020). Although the situation is yet to be evaluated from the patient's perspective, health care workers, especially in the most affected areas, have exhibited high-stress levels. They experience "a traumatic condition called secondary traumatic stress disorder which is the discomfort

experienced in the helping relationship when treatments are not available for all patients." (Saladino et al., 2020). Most are when the HCW has to choose from limited options on who survives, especially those working in High Depended and Intensive Care Units (HDU and ICU). An investigation conducted upon over 1,200 Healthcare practitioners showed significantly higher percentages of stress among individual workers. Both stress and Insomnia stored at 70% and 30%, respectively, while depression and anxiety came out to be 50% and 44%. These outcomes collectively result in the deteriorating mental state of health care workers, especially during the pandemic.

2.2 Online Remedy

The risk of contention has grown, especially during the pandemic, leading to alternative meetings and socializing. Health experts are aware of the impending long-term effects of social distancing and quarantine practices. Online services have before being developed by different service providers and stakeholders in the telecommunication industry to remedy the situation (Zhou et al., 2020). There is a close connection between the psychological state of the community and the increasing application of online platforms for interactions among individuals in society. Zhou et al. (2020) argue that online interactions have been the case due to the need for the public health sector to remedy the increasing situations of psychological issues. People have become scared of physical contact with each other due to the fear of contagion. Others have also exhibited mental instability due to fatigue, especially those working in Healthcare facilities.

2.2.1 Implications of the Online Remedy

Barely a week after the declaration of Coronavirus as a pandemic, nearly 8,000 people had already died worldwide with more than 190,000 infections. These statistics are constantly spoken about by almost all news sources and other social media outlets like Facebook, Twitter, and Instagram. As the pandemic had seemingly taken its course in terms of spread across various regions of the globe, it said fear among the entire global population leading to panic among healthcare workers and the general public. People contacted fear and became traumatized due to the scary nature of the virus exhibited why the number of infections and fatalities (Roy et al., 2020). The virus did not restrain as time went by, and public health care stakeholders were concerned about healthcare providers' and patients' psychological and physiological needs. To reduce the burden of comorbid mental health conditions among HCWs and patients, psychological attention or support is required for the affected patients.

The main challenge was to provide psychological support to affected patients to reduce the mental health impact. The need to provide support and therapeutic attention to the patients in isolation highlighted the necessity of telehealth services. Therefore, all stakeholders in the telecommunication field were engaged in providing health care services through emails, text messages, and smartphone applications. China was the first country to initiate telehealth services, especially during the pandemic, to support patients and healthcare workers (Cao et al., 2020). Online platforms used by the Chinese public health sector provided psychoeducation, Training, supervision, and counselling. These services have been recommended and practised on people with a higher risk of coronavirus infection in China and other countries (Sun et al., 2021). According to earlier reports, "people in isolation actively sought online support to address mental health needs, which demonstrated both a population interest and acceptance of this medium." The attempts by Healthcare professionals and stakeholders to prevent the chronicity of the disease are indeed working through the telehealth concept.

Telepsychology is one of the survival tactics that have been developed into the advantages of the pandemic. It is a vital tool due to its ability to take care of the psychological suffering of both patients and healthcare workers, especially in the most affected areas. The affected groups are exhibiting prolonged anxiety, stress, and depression. Ammar et al. (2020) takes note of the modification of human relations due to restrictions and statistics that spark the fear of contagion. This behaviour was also exhibited by other researchers, especially during the coronavirus pandemic. The seriousness and adversities of the virus are providing a unique adoration of the environment which calls for a change of behaviour in humans that is parallel to the infamous mouse experiment on social behaviours.

2.3 Overall Implications of the Pandemic

When the world Health Organisation medical team held a virtual conference meeting on 11th March 2020, the fear of the worst pandemic was confirmed across different global divides. The world braced itself for the impact of the pandemic, which was expected to have severe effects on all aspects of life (Roy et al., 2020). Travels were restricted and economics were hit badly by the lockdown measures imposed by the governments in their countries. As of February 2021, 96 million people had already contracted the virus while 2.1 million were dead. The infected persons suffered health issues while others lost their jobs and their loved ones due to the pandemic.

Consequently, suicidal thoughts, anxiety, and depression skyrocketed during the pandemic. A study by the centre for disease control in the U.S. in 2020 reported that cases of depression, suicidal thoughts, and anxiety went up an average of three times the ordinary number among Americans. The consequential outcome of this social state in all society was attributed to an increase of 14% of alcohol consumption and substance abuse in the U.S. Shockingly, near 50% of the sample space used by the CDC in the research expressed at least one symptom of a mental problem. Although there is no clear relationship between the emergence of the virus and the situation of society, according to the study, Li and Zhang (2020) attributes it to isolation, quarantine separation, and other health preventive measures to curb the spread of the virus.

Observations of the show that covid-19 significantly affected socially marginalized people in different regions of the world. The infection rates in these areas were significantly high at the peak of the pandemic. These people were already living in difficult situations with low incomes, some of which could not meet their daily needs. A considerable percentage of this population is also essential and health workers in their communities. The occupations of these people were already given very little to their names, yet they had been declared essential (Kim & Bostwick, 2020). All these factors contributed to the rapid spread of the virus in socially and economically marginalized communities. While health restriction measures forced many people to stay indoors, those coming from disadvantaged communities had little choice since they had families and other responsibilities to undertake (Dubey et al., 2020). These frustrations lead to psychological and social problems in many communities, especially those of minorities.

2.4 The Aftermath

As the world is struggling to recover from the effects of a pandemic, there are still several reasons for fear. It is the case especially for those who survived the virus. Vaccines are being rolled out in nearly all corners of the world, hoping that the spread of the virus will be stopped. However, its effects are still vivid on people's minds, especially those related to health complications such as difficulty breathing and sudden death. Esterwood and Saeed (2020) have noted that health restrictions that led to minimal physical contact are still the case in society, especially when interacting together. Any activity with close contact with others during the pre-coronavirus pandemic such as shaking hands is prohibited during the lockdown. Society is still yet to fully embrace these practices amidst an attempt to stop the pandemic through vaccine administration and preventive health practices.

As for the psychological effects, Kontoangelos et al. (2020) suggest that the effects may be prolonged since they require a slower and collective approach to be improved. The effects of the pandemic on the mental health of individuals vary from the extent to which an individual experienced the virus differently. Psychological problems were majorly caused by the scary nature of the virus and its direct effect on the economy and the way of life. Many people lost jobs during the pandemic, which led to complex and constrained life in livelihoods. The individuals who lost their loved ones and others who survived from the virus in the ICU or HDU will require a long time to overcome anxiety, fear and panic. Generally, health restrictions made to minimize the spread of the virus have a significant social impact on society. These restrictions caused people to be stressed by losing jobs and livelihoods and the closing of businesses and schools. The psychological impact of the pandemic is almost indelible on the minds of people.

3. Critique of the Literature

The reaction exhibited by the human species against the pandemic is expected in any ordinary circumstance. A connection of these reactions with the most experiment conducted in 1940 exhibit a similar outcome. The coronavirus pandemic changed almost all aspects of life, with the most effects recorded in public health. Krishnan et al. (2020) pointed out the similarities between the coronavirus pandemic and that of 1918. However, the ongoing pandemic is more potent in terms of infection rate as well as fatality. One would expect that the human species was prepared for such an epidemic from the experience of 1918 (Barro et al., 2020). The mouse experiment, however, demonstrates a different scenario.

The fear of contagion expressed during the component in a pandemic, as Saladino et al. (2020) show, was expected. Coronavirus pandemic was extraordinary into the rate of spread and its fatality. A social experiment conducted on mice by Taylor in 1941 showed that these animals started to look for ways of surviving when exposed to an altered environment. They expressed less concern about their ordinary life while focusing on the methods of surviving. It was the case, especially when the animals were placed in densely populated experimental areas. Their bodies also started adapting to the environment in which they were exposed. Taylor found out that this was the case due to the shift in their behaviour triggered by the adoration in the environment.

Covid-19 emerged at a time when the population of the world was rapidly growing. Comparing the current pandemic and that one of 1918 concerning the most experiment brings a different outcome. "Demographers estimate the global population in 1918 at about 1.8 billion persons." (Barro et al. 2020). However, both environments were altered why the pandemics, the one for 2019, were more demanding in terms of greater population numbers. It was a time when individuals only cared for their safety against the virus. Other societal practices which could compromise the health restrictions imposed by various governments were easily abandoned. Even though safety concerns were inevitable During the pandemic, social and psychological aspects of life were ignored and later proved detrimental in ordinary life.

One of the most evident tactics for survival during the pandemic was the use of online platforms for meetings. However, Peng et al. (2021) took note of a negative atmosphere in the online platforms exhibited by the bitter exchange of words and other unruly actions like the common mass shootings in the United States for the better part of 2020. Other platforms like TiK ToK and Facebook have promoted viral video clips which put people's lives at risk. Although these practices were meant to be survival mechanisms for overcoming boredom and stress during the pandemic, they turned out to be harmful to society. Such activities have been closely linked to people's mental state, which was caused by the frustrations of the pandemic. Peng et al., (2021) think that these practices may have routed themselves into the society hence the difficulty of termination and elimination.

As people were battling negative outcomes of the pandemic, such as loss of jobs and livelihoods, the mental pain was becoming real in the community (Wilson et al., 2020). Job loss issue has been connected to other mental problems by Wilson et al. as indicated in Table 1 below.

Table 1. Regressions Predicting Mental Health. Source: Wilson et al., 2020

	Anxiety Symptoms			Depressive Symptoms		
	β	SE	95% CI	β	SE	95% CI
Age	-0.05	0.01	-0.05, 0.003	-0.01	0.01	-0.03, 0.02
Sex	-0.04	0.31	-1.04, 0.17	0.07*	0.33	0.14, 1.45
Race	0.01	0.38	0.60, 0.89	0.03	0.41	-0.35, 1.25
Relationship status	0.02	0.36	-0.50, 0.92	-0.06	0.39	-1.43, 0.09
Income	0.002	0.06	-0.11, 0.12	0.02	0.06	-0.07, 0.17
Education	-0.03	0.10	-0.30, 0.10	0.01	0.11	-0.17, 0.26
Healthcare worker	-0.05	0.47	-1.73, 0.10	0.01	0.50	-0.84, 1.13
Children in the home	-0.02	0.18	-0.49, 0.23	0.01	0.20	-0.31, 0.47
Perceived health	0.01	0.36	-0.57, 0.83	-0.01	0.38	-0.94, 0.57
Illness recency	0.06	0.13	-0.06, 0.43	0.23***	0.13	0.55, 1.06
COVID-19 infection status	0.01	0.50	-0.77, 1.19	-0.001	0.54	-1.11, 1.00
Depressive symptoms	0.69***	0.03	0.58, 0.72	-	-	-
Anxiety symptoms	-	-	-	0.70***	0.04	0.67, 0.82
Concern about COVID-19	-0.01	0.22	-0.49, 0.27	-0.03	0.23	-0.64, 0.29
Daily life affected by COVID-19	0.04	0.18	-0.15, 0.57	0.04	0.20	-0.15, 0.62
Likelihood of contracting COVID-19	0.12***	0.17	0.31, 0.97	-0.04	0.19	0.59, 0.14
Following news coverage of COVID-19	0.08**	0.16	0.11, 0.73	-0.07*	0.17	-0.69, -0.12
Self-quarantining	-0.01	0.35	-0.78, 0.60	0.03	0.38	-0.39, 1.08
Perceived social distancing	0.004	0.20	-0.38, 0.42	0.01	0.22	-0.36, 0.49
Job insecurity	-0.04	0.14	-0.41, 0.12	0.07*	0.14	0.01, 0.57
Financial concern	0.12***	0.15	0.29, 0.88	-0.01	0.17	-0.36, 0.29

To cope with the pandemic, any close contact among people or large gathering activities are discouraged or prohibited across the globe. These practices lead to the termination and cancellation of large group social events. The meaningful outcome, in this case, led to the common use of social media to solve problems such as healthcare services. Many people have adapted to online meetings and remote execution of duties, as exhibited in the case of the mouse experiment (de Oliveira et al., 2020). In both cases, an altered environment leads to the animals looking for better ways of survival, changing their attitudes, habits, and behaviours.

The spread of the Coronavirus was not expected to last long from the view of experts. As the virus continued ravaging lives across the globe, it came with different mutations, which have proven to be severe and treacherous. These variants lead to more health restrictions in different parts of the world, calling for further economic recession. Individuals started having prolonged periods of thoughts and anxiety, leading to instability in terms of mental health. According to Weiner et al. (2020), the rise of domestic violence in 2022 to the mental issues coming from the frustrations of the coronavirus pandemic. As exhibited by the mouse experiment, an alteration in ordinary life leads to a struggle for a probability that may change organisms' social and psychological behaviour in the environment. The world was not prepared for the adversities of the coronavirus pandemic. The unpreparedness has led to detrimental outcomes, especially in the public health sector regarding society's social and psychological well-being.

The emergence of telehealth to combat the adversities of psychological effects of the covid-19 is another mechanism for survival. Although telehealth practices and programs had already been invented and tested by some health systems across the globe, they had not been extensively explored as a new field of Medical Practice. The Invention has enabled positive milestones such as reducing waiting times as soon as coordination of medical practices for both caregivers and patients. It has also enabled adequate attention to patients unable to meet their doctors like the old physically. It generally gives the patients a chance to interact with their doctors without necessarily having to leave the comfort of their homes.

On the other hand, telehealth services, especially during the Coronavirus pandemic, have not been effective when dealing with psychological problems. For instance, the provision of remote psychotherapeutic services to patients, especially during the coronavirus pandemic, has not been effective compared to the in-person services (Weiner et al., 2020). Weiner et al. (2020) also suggest that telehealth services are likely to be highly adapted by various health systems across the globe as the new trend in the medical sector. It will significantly change the nature and approaches in the field of medicine. This observation is justified by the numerous advantages exhibited by telehealth services in comparison to disadvantages. Subsequently, the general well-being of the public will also

significantly be altered due to the emerging practices. The change may not be witnessed soon enough, but it is inevitable at the expense of the coronavirus pandemic.

4. Conclusion

The pandemic has significantly affected how people interrelate with each other in society. The pandemic has resulted negative impacts on psychological and social effects, leading to a completely new way of life by people across different divides. As the coronavirus pandemic abruptly emerged and started spreading across the globe, the requirement for protection, especially at a personal level, was beyond question. The convention of coronavirus prevention measures implemented by various governments across the world was meant to protect the general public from any potential risk or harm caused by the pandemic. Health practitioners, especially those involved in the frontline duties against the pandemic, had good intentions and practice on personal preventive measures. Notwithstanding, the reception of the prevention measures by the society was against the expectations. The pandemic has significantly changed lives in terms of psychological and social aspects.

The period of the coronavirus pandemic has led to an increase in time spent at home by individuals while reducing the distance between people by various communication devices. However, all these parameters lead to negative outcomes such as persistent family issues and social media problems. The pile-up of these frustrations, including loss of jobs and sources of livelihoods, led to significant psychological and social problems in society. It provided a new perspective of social and psychological phenomena as critical aspects of public health. Emotional connections have been gradually reduced on many occasions and replaced by man-machine relationships. The pandemic has substantiated the rapidly growth in technology adoption by individuals.

5. Recommendations

Taking into considerations of what mentioned above, the following recommendations have been proposed to remedy the situation specifically for futuristic purposes.

5.1 Frontline Prevention

Relevant stakeholders and role players, especially in the public health sector, should adopt primary prevention practices. The necessity of these practices should be taken into consideration of the anti-risk population. Individuals should be protected against any mental disorder-related problems markedly in the wake of such a pandemic. Counselling and monitoring practices are necessary for the target groups such as students, teachers, healthcare workers and other key workers. The feasibility of this recommendation is to be justified by studying and investigating the effects of the pandemic from psychological and social perspectives.

5.2 Peripheral Prevention

Online tool can be utilized as a secondary prevention measure to meeting, monitoring and provide support to people during the pandemic. In addition, tools and spacers for internal and interpersonal communication could be integrated with psychological treatment system to provide treatment and support remotely. For example, through virtual reality and holograms, better diagnosis and treatment could be carried out for people who suffers with psychological issues during the pandemic. The psychotherapists can also be trained to learn to utilize online platforms to perform their diagnosis and treatment duties effectively. These practices will help in raising public awareness and promoting the benefits of telehealth application to the general public.

5.3 Research

Additional research is required to understand the psychological and social effects from the coronavirus pandemic, because the definition of public health should also encompass mental health and corresponding social changes.

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