An overview of preventive and control strategies for common mental health disorders during infectious disease epidemics

[version 1; peer review: awaiting peer review]

Shradha Parsekar¹, Vijay Shree Dhyani¹, Eti Rajwar¹, Jisha B Krishna¹, Bhumika Tumkur Venkatesh¹, Kavitha Saravu², Helmut Brand¹

¹Public Health Evidence South Asia, Prasanna School of Public Health, Manipal Academy of Higher Education, Manipal, Karnataka, 576104, India
²Department of Infectious disease, Kasturba Medical College Hospital, Manipal, Karnataka, 576104, India

Abstract

Background: The emergence of the COVID-19 pandemic has affected people's mental health owing to different factors. The primary objective of this review was to systematically summarize available literature on the range of interventions for common mental health disorders during an infectious disease outbreak, specifically focusing on the COVID-19 pandemic.

Methods: We searched PubMed, PsychInfo, Scopus, Web of Science, CINAHL, EPPI mapper and Google Scholar to identify English literature published since January 2010. We included scientific research studies and grey literature, extracted the information and summarized results thematically.

Results: A range of common mental health disorders that affected populations from most parts of the world and associated factors were identified. We thematically classified intervention into the following: providing accurate and timely information and ensuring adequate supplies of daily need essentials; developing mindfulness and resilience that can revive self-sufficiency and self-awareness in stress management; early identification; providing necessary mental health care through professionals; and health system strengthening and capacity building interventions.

Conclusion: There is an immediate need for a collective action through inter-sectoral coordination at community, national and international levels. Policymakers and program implementers should be prepared to tackle common mental health disorders amidst the ongoing COVID–19 pandemic and in future emerging and re-emerging infectious disease outbreaks.
Keywords
COVID-19; Epidemic; Infectious disease; Narrative review; Mental health disorder; Pandemic; Psychological health.

This article is included in the Manipal Academy of Higher Education gateway.

This article is included in the Emerging Diseases and Outbreaks gateway.

Corresponding author: Bhumika Tumkur Venkatesh (bhumika.tv@manipal.edu)

Author roles: Parsekar S: Conceptualization, Data Curation, Formal Analysis, Writing – Original Draft Preparation, Writing – Review & Editing; Dhyani VS: Conceptualization, Data Curation, Formal Analysis, Writing – Original Draft Preparation, Writing – Review & Editing; Rajwar E: Conceptualization, Data Curation, Writing – Original Draft Preparation, Writing – Review & Editing; Krishna JB: Conceptualization, Data Curation, Writing – Original Draft Preparation, Writing – Review & Editing; Venkatesh BT: Conceptualization, Data Curation, Supervision, Validation, Writing – Review & Editing; Saravu K: Writing – Review & Editing; Brand H: Writing – Review & Editing

Competing interests: No competing interests were disclosed.

Copyright: © 2022 Parsekar S et al. This is an open access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

How to cite this article: Parsekar S, Dhyani VS, Rajwar E et al. An overview of preventive and control strategies for common mental health disorders during infectious disease epidemics [version 1; peer review: awaiting peer review] F1000Research 2022, 11:297 https://doi.org/10.12688/f1000research.74273.1

First published: 10 Mar 2022, 11:297 https://doi.org/10.12688/f1000research.74273.1
Introduction
In the twenty-first century, one of the biggest concerns for global public health are emerging and re-emerging infectious
diseases. The world has witnessed many such events caused by new viruses, such as coronaviruses causing Severe Acute
Respiratory Syndrome (SARS) or Middle East Respiratory Syndrome (MERS) or re-emerging viral infections such as
Ebola and Zika. Starting in December 2019, a new highly pathogenic and virulent strain of the coronavirus led to an
epidemic of unknown acute respiratory disease. The World Health Organization (WHO) in February 2020 named this
disease as the coronavirus disease 2019 or COVID-19. Subsequently, the WHO declared COVID-19 as a Public Health
Emergency of International Concern, which was eventually classified as a pandemic in March 2020. As of July 2021, the
COVID-19 pandemic has affected people in more than 200 countries and territories (irrespective of economic status) causing over 194 million cases and 4 million fatalities around the world. Furthermore, numerous countries have already experienced more than one wave of COVID-19 infections.

Recently, South Asia saw an exponential rise in cases of COVID-19. In the latter half of April and early May 2021, India reported over 400,000 daily COVID-19 cases, which were the highest reported by any country ever since the pandemic began. A similar situation was later seen in Indonesia. The sudden rise in COVID-19 cases has put a toll on the healthcare system, which was already facing inadequate infrastructure and resources. Besides, the emergence of newer contagious strains of the virus turned out to be more deadly even for young adults. Additionally, black fungus cases have worsened the situation.

The pandemic and associated complications have not only challenged healthcare systems but also resulted in elevating mental health disorders such as anxiety, depressive symptoms, distress and other psychological symptoms. Furthermore, the pandemic lead to increased social isolation and unemployment globally. Unemployment leading to economic crisis decreased the overall mental health of individuals and their families, and in extreme cases suicidal behavior has been reported. Mental health disorders worsened in the second wave of COVID-19, especially in South Asia.

During an infectious disease outbreak, different factors are responsible for increased mental health disorders. The population subgroups that are most affected by common mental health disorders during infectious disease outbreaks (especially during second wave) were healthcare workers (HCWs) posted in intensive care units, non-clinical hospital staff, paramedics, police officers and grocery store staff, due to nature of their work and long working hours. Other population groups that were affected include individuals having preexisting chronic diseases or mental health disorders, children, family caregivers, and older adults.

Many interventions are available for common mental health disorders. Some of them are focused on specific age groups like health promotion for socially isolated older adults and social participation for targeting mental health disorders in adults. However, amid COVID-19, the situation is complex as it is affecting mental health wellbeing of a larger population, concurrently, all over the world. Therefore, it becomes paramount to devise strategies that have a wider reach and applicability in this situation of unprecedented unpredictability, while attempting to reduce stress overload. With this review we intend to explore the literature on the range and scope of interventions available for common mental health disorders faced by different population sub-groups, during an infectious disease epidemic, specially focusing on the COVID-19 pandemic.

Methods
Search terms and search
English language literature was searched in electronic databases viz. Medline via PubMed, CINAHL, Web of Science, Scopus and PsychInfo, and additionally, we searched EPPI mapper and Google Scholar. The search was restricted to publications on or after January 1, 2010, in order to obtain the most recent evidence on newly emerging infectious disease outbreaks.

Using keywords and related terms, a comprehensive search strategy was employed for each database. Keywords used were (social isolation, social distancing, social marginalization, social-alienation, quarantine, self-quarantine, self-isolation), AND (pandemic, epidemic, outbreak, disease outbreak, infectious disease outbreak, severe acute respiratory syndrome, SARS, MERS hemorrhagic fever, avian flu, Ebola, influenza, middle east respiratory syndrome, coronavirus, COVID-19, coronavirus, SARS CoV, SARS CoV-2), AND (mental health, mental health disorders, psychological wellbeing, psychological stress, post-traumatic stress disorder, PTSD, depression, separation, anxiety, loneliness, psychological, suicidal thoughts, suicidal ideation panic attack). The full PubMed search strategy is provided as Extended data.
Eligibility criteria
Journal publications reporting information on any intervention targeted to prevent or control mental health disorder associated with infectious diseases, with no restriction on population, were included. Common mental health disorders were operationalized as anxiety, depression, panic disorder, post-traumatic stress disorder (PTSD), obsessive compulsive disorder (OCD) and simple phobia. Any emerging and re-emerging acute infectious diseases were eligible for inclusion. However, we excluded long standing infectious diseases such as HIV and tuberculosis. Population groups considered were frontline HCWs, mental health patients, vulnerable population viz. older adults and children, other essential workers and general population, during an infectious disease outbreak.

Study selection, data management and analysis
In this narrative review, for replicable or reproducible methodology, we have followed few of the steps of a systematic review. Articles were screened by five authors (BTV, ER, JB, SSP, and VSD) independently, forming pairs of two for title/abstract screening. However, for full text screening we divided the articles between five authors and therefore, independent screening was not followed.

Relevant data were coded from included full texts in a pilot tested coding form by five authors (BTV, ER, JB, SSP and VSD). The results in this narrative review were thematically synthesized based on various strategies and interventions. EndNote X7 software was used for data management. We have briefly summarized the population affected, different range of common mental health disorders, predicting factors of these disorders, and control and prevention of these disorders during infectious disease outbreaks.

Results
Included literature
Included publications were a mix of original research articles, reviews, and systematic reviews including rapid reviews, from across the world. We excluded editorials and commentaries. Most publications were on the current ongoing COVID-19 pandemic, however, we also identified studies conducted during MERS, SARS, Ebola, H1N1 Influenza and other infectious disease outbreaks.

Detailed synthesis of results
We summarized the possible strategies and interventions for common mental health disorders, associated with infectious disease outbreaks. Figure 1 provides snapshot of population affected, common mental health disorders and interventions that help in maintaining or improving mental health wellbeing.

Vulnerable or affected populations
Emerging and re-emerging infectious diseases are a constant threat to the entire world. During an infectious disease outbreak, almost all people, irrespective of age and gender are vulnerable to common mental health disorders. However, the risk and severity of these disorders may vary between different people. Populations that mostly experienced common mental health disorders were (a) general population; (b) children and youth; (c) older adults; (d) people with existing chronic conditions and mental illness; (e) disability or developmental disorders; (f) people isolated/quarantined and infected with infectious diseases; (g) caregivers; (h) underprivileged community; and (i) healthcare staff.

Common mental health disorders and associated factors during infectious disease outbreak
A wide range of mental health disorders with varying prevalence, affecting all populations and requiring immediate attention, surfaced during infectious disease epidemics. Table 1 outlines the mental health disorders reported during various infectious disease outbreaks. These mental health disorders affected general wellbeing. There was high pooled estimated prevalence of anxiety (25-46%), distress/stress (13.4-41.1%), PTSD (33%), and depression (22-33.7%).

Prevalence of anxiety was higher among quarantined individuals (57.9%), people living with non-communicable diseases (NCDs) (40-55.4%), COVID-19 positive cases (8-47%), the general population (29.8-56%), HCWs (29.0-49%), students (28.2%) and other medical staff (19.9%). Prevalence of depression was higher among COVID-19 positive cases (41.7-55%), quarantined individuals (38.8%), people living with NCDs (44.8%), students (34.8%), physicians and nurses (25-31.0%), and other medical staff (14.1%). More information on burden and factors associated with common mental health disorders, during the infectious disease outbreaks, is provided as Extended data.
Interventions to prevent and control common mental health disorders during infectious disease outbreak

i. Providing accurate, timely information and ensuring adequate supplies of daily need essentials;

Many strategies have been advocated to address the overall wellbeing of the people during an epidemic. One of the commonly used strategies to reduce burden of psychological stress (applicable for all population groups) is primary prevention strategy that can be broadly characterized as ‘first-aid mental health intervention’. Components of this strategy include providing precise and timely information, in the form of government guidelines, regarding prevention and treatment interventions. The guidelines can be implemented via print media and videos but supervision is required by trained mental health professionals. Guidelines shared by national and international psychological associations can be utilized appropriately.

Mass media including social media has a huge and important role in communicating timely and accurate information to the public, during an infectious disease epidemic, especially observed during COVID-19 pandemic. Appropriate spread of information by the government was found to be effective in decreasing the anxiety among public. However, information from the reliable sources and avoiding excess social media exposure is also important.

Providing clear communication even for follow-up information on changes in treatment modalities is the principal step in creating an environment devoid of panic and fear. Ensuring timely and appropriate supplies of food, clothes, medicine and accommodation to remove any uncertainties in times of lockdown, quarantine and isolation were necessary.

There is a need for alleviating the stigma associated with mental health disorders and infectious diseases itself because of which many individuals hesitate to get themselves screened. Mass media can play an important role in lessening the stigma and can pay attention to sensitive reporting. Some countries have released sensitive reporting guidelines.
<table>
<thead>
<tr>
<th>Common mental health disorders or symptoms</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General population</strong></td>
<td></td>
</tr>
<tr>
<td>General mental health wellbeing or mental health symptoms</td>
<td>64,72–76, COVID-19:77</td>
</tr>
<tr>
<td>Anxiety</td>
<td>COVID-19:62,63,65,67,70,74,75,78–91</td>
</tr>
<tr>
<td>Any infectious disease outbreak</td>
<td>48,54,57,58,92</td>
</tr>
<tr>
<td>MERS</td>
<td>24</td>
</tr>
<tr>
<td>Ebola</td>
<td>50</td>
</tr>
<tr>
<td>Depression or depressed moods</td>
<td></td>
</tr>
<tr>
<td>Ebola</td>
<td>50</td>
</tr>
<tr>
<td>COVID-19</td>
<td>46,63,65–67,70,74,75,78–81,83,84,86–91,93,94</td>
</tr>
<tr>
<td>SARS</td>
<td>48</td>
</tr>
<tr>
<td>Any infectious disease outbreaks</td>
<td>55,57,58,92,95</td>
</tr>
<tr>
<td>MERS</td>
<td>96</td>
</tr>
<tr>
<td>Distress, psychological stress/problem or emotional changes</td>
<td>46,67,70,78,87,97</td>
</tr>
<tr>
<td>Any infectious diseases:</td>
<td>55,57,58,84,87,90</td>
</tr>
<tr>
<td>A/H1N1 Influenza:</td>
<td>53,54,57,58,61,83,91,93,94</td>
</tr>
<tr>
<td>SARS</td>
<td>48</td>
</tr>
<tr>
<td>COVID-19</td>
<td>82,86</td>
</tr>
<tr>
<td>Insomnia</td>
<td>67,81,87,91</td>
</tr>
<tr>
<td>Any infectious disease:</td>
<td>95</td>
</tr>
<tr>
<td>Uncertainty and fear about future</td>
<td>74,89,99</td>
</tr>
<tr>
<td>Reduced concentration and motivation, loneliness, &amp; boredom</td>
<td>74</td>
</tr>
<tr>
<td>Wariness and mistrust</td>
<td>100</td>
</tr>
<tr>
<td>Maladaptive behaviors</td>
<td>Seeking excessive information, impulsive decision-making</td>
</tr>
<tr>
<td>Protective behaviors</td>
<td></td>
</tr>
<tr>
<td>Any infectious disease:</td>
<td>57</td>
</tr>
<tr>
<td>Obsessive-compulsive disorder</td>
<td>63</td>
</tr>
<tr>
<td>Frustration, anger, confusions</td>
<td>Any infectious disease outbreaks:</td>
</tr>
<tr>
<td>Stressors with respect to inter-personal relations</td>
<td>Ebola:</td>
</tr>
<tr>
<td>Neglect, stigmatization</td>
<td>58</td>
</tr>
<tr>
<td>Social isolation &amp; loneliness</td>
<td>91</td>
</tr>
<tr>
<td>Post-Traumatic Stress Disorder (PTSD)</td>
<td>A/H1N1 Influenza:</td>
</tr>
<tr>
<td></td>
<td>SARS:</td>
</tr>
<tr>
<td></td>
<td>COVID-19:</td>
</tr>
<tr>
<td></td>
<td>Any infectious disease:</td>
</tr>
<tr>
<td>Grief over loss of family member</td>
<td>102</td>
</tr>
<tr>
<td><strong>Existing mentally ill patients</strong></td>
<td></td>
</tr>
<tr>
<td>Depressive disorder and related health problems</td>
<td>65,73,90</td>
</tr>
<tr>
<td>Anxiety</td>
<td>65,90</td>
</tr>
<tr>
<td>Mental health exacerbated or relapsed during COVID-19</td>
<td>103</td>
</tr>
<tr>
<td>Substance and alcohol use</td>
<td>75</td>
</tr>
<tr>
<td>Suicidal tendencies</td>
<td>SARS:</td>
</tr>
<tr>
<td>Development of delirium</td>
<td>SARS:</td>
</tr>
<tr>
<td><strong>Healthcare workers</strong></td>
<td></td>
</tr>
<tr>
<td>Distress</td>
<td>COVID-19:</td>
</tr>
<tr>
<td>Obsessive compulsive disorder</td>
<td>66</td>
</tr>
</tbody>
</table>
Developing mindfulness and resilience that can revive self-sufficiency and self-awareness in stress management:

This section is further divided based on population subgroup.

**General population**

Developing mindfulness\(^{115}\) and psychological resilience were used as strategies during the COVID-19 pandemic.\(^{115}\) There are many interventions e.g., e-interventions developed for improving self-sufficiency. One such e-intervention based on mindfulness, named ‘CoPE It’, has been ethically approved in Germany and its evaluation is ongoing.\(^{116}\) Other coping mechanisms that can improve self-sufficiency were acceptance-based coping\(^ {117}\) and practicing self-compassion.\(^ {115}\)

In order to protect oneself from mental health disorders, amidst infectious disease outbreaks, systematic psychological self-care can be practiced by indulging in mindfulness-based strategies.\(^ {117}\) These are the most convenient and economically viable methods to reduce stress among all populations.\(^ {118}\) Mindfulness-based strategies include physical activity,\(^ {55,99,110,113,117}\) yoga,\(^ {74,82}\) listening to music,\(^ {115}\) indulging in adequate sleep and stress management programs,\(^ {110}\) meditation,\(^ {74,82}\) and progressive muscle relaxation.\(^ {82}\) Additionally, mindfulness includes art-based interventions,\(^ {110}\) such as working on a hobby or engaging in creativity.\(^ {43}\) Engagement in religious activities and keeping religious faith gives hope and can be an effective coping strategy.\(^ {51,56}\)

The approach to self-regulation\(^ {97}\) can be achieved by having a routine\(^ {113}\) and control over the activity schedule.\(^ {115}\) This can be done with the help of digital wellbeing applications that help in keeping track of the daily routine and sleep.\(^ {113}\)

A review of reviews carried among various population sub-groups demonstrated that self-guided therapies (e.g. mindfulness, cognitive-behavioral techniques, Acceptance and Commitment Therapy), positive psychology-based interventions (e.g. optimism, kindness or gratitude delivered via online or offline) and activity-based interventions (exercise) had small to medium effects in reducing depressive symptoms, anxiety and stress during isolation.\(^ {120}\) Multi-component combination of online and app-based interventions had small to medium effects in reducing the common mental health disorders.\(^ {120}\) Another review suggested that psychological therapy interventions (such as laughter therapy, Tai Chi Qigong meditation and mindfulness-based), social facilitation (facilitating interactions between peers) and befriending (making new friendship) interventions were effective in reducing loneliness.\(^ {121}\)

### Table 1. Continued

<table>
<thead>
<tr>
<th>Common mental health disorders or symptoms</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTSD</td>
<td>65,66,71</td>
</tr>
<tr>
<td>Insomnia</td>
<td>71</td>
</tr>
<tr>
<td>Exhaustion and mental health issues</td>
<td>SARS:48 , Any infectious diseases:58</td>
</tr>
</tbody>
</table>
| - Job stress due to burnout, risk of infection, unclear job instructions and infectious control policies
  - Fear of getting infected or infecting others
  - Discrimination and high expectations of public leading to role overload
  - Hyperarousal and avoidance behavior towards family members | SARS:105 , Any infectious diseases:58 , COVID-19:106 |

#### Children and youth

| Boredom                                  | COVID-19:56,109 |
| Internet addiction                       | COVID-19:49 |
| PTSD                                     | COVID-19:65,107 |
| Emotional reactions or mental health outcomes/condition | COVID-19:56,107,108 |
| Positive reactions such as hope, belongingness, relationship with peers, life satisfaction | COVID-19:108 |
People can be encouraged to foster strong interpersonal ties and compassion during these physically distant times. There is a need for spending quality family time/support. Keeping in touch with friends through phone/video calls and maintaining social networks through social media platforms may help in lessening the feeling of loneliness.

During an Ebola outbreak, survivors of the disease worked as volunteers to provide mental health support and creating awareness for the prevention and control of spread of infection, while one group of survivors became advocacy providers to consultants and provided the information on challenges faced by survivors.

1. Children and young people

Children require specific attention during epidemics, as their mental health wellbeing is affected as they are homebound with restricted outdoor activities. Inculcating healthy lifestyle habits and having an activity schedule is advisable. Parents’ role in maintaining their children’s wellbeing, both physical and mental, is of great value during an epidemic. Engaging children in household chores to become independent, building healthy familial bonds, and practicing adaptive coping are important strategies. Enrolling for online exercise classes (including dancing and singing) or support system would be helpful. Strategies such as semi-structured play activities, a short walk, LEGO-based therapy and online gaming can keep children occupied. However, these strategies should be implemented under the strict supervision of parents or caretakers.

Quarantined children can continue to have regular telephonic communication with parents for reassurance and support. These children can receive educational and other important information via comics and videos. Providing necessary and timely mental health support to children in quarantine and educating children about normative reactions during COVID-19 are important strategies.

Online gaming is becoming common in keeping young people occupied especially during the COVID-19 pandemic. However, online gaming has its own repercussions such as excessive screen time and behavioral addictions. A mixed methods study reported the beneficial effects of playing video games on the mental health of study participants. These video games were used for entertainment, medium to motivate, to remain physically active or as an escape mechanism/distraction. Therefore, balanced and healthy approach, which is both physically engaging and socially interactive (such as exergames) can provide effective results to cope with psychological distress. The WHO has extended its support to initiatives such as #PlayApartTogether to encourage online gaming and socializing.

Underprivileged children are at increased risk of hunger, violence, abuse and exploitation thus increasing their vulnerability to anxiety, depression and suicide. Community volunteers, NGOs, and police can be involved in identifying these children, provide the psychological first aid, help in financial empowerment, and coordinate and refer to mental HCWs.

2. Healthcare workers (HCWs)

HCWs are subjected to large amounts of stress and burnout during an infectious disease outbreak, leading to undiagnosed mental health problems that are often ignored. Encouragement and greater solidarity by colleagues can enhance the morale of the high-risk HCWs, working in infectious diseases wards, as was seen during SARS epidemic. Family and friends support via telecommunication act as a coping mechanism for common mental health disorders among HCWs. Availability of protective gears was found to be assuring for the HCWs.

Self-coping strategies such as resilience, acceptance and active coping were found to be effective in controlling mental health disorders. Appropriate planning, behavioral disengagement, self-distraction, mindfulness and life adjustment such as indulging in physical activity and sleeping were self-coping strategies that were used by HCWs. Earlier mindfulness-based interventions have proven to be effective to improve wellbeing of HCWs and potentially reduce stress among HCWs. Music therapy was found be effective among HCWs (who were quarantined in Italy during the COVID-19 pandemic) against anxiety and depression. Accessing mental health support such as counselling or psychotherapy and insurance and compensation related facility were found to be effective in reducing the mental health disorders among HCWs.

Implementation of workplace interventions were influenced by HCW or organization’s lack of awareness on their own mental health support needs and a lack of equipment, staff time or skills needed for an intervention. While strategies
that were customized for local needs; with effective communication, both formally and socially; and with positive, safe and supportive learning environments for frontline workers facilitated workplace intervention implementation.  

3. **Older adults**

Special attention should be given to psychosocial support and an interpersonal inventory for older adults. Friends, neighbors, volunteers or peers can come forward to help older adults to help overcome social isolation and provide mental health support. A previously conducted systematic review among older adults demonstrated acceptability, feasibility and effectiveness of telemedicine interventions for mental health care.  

4. **COVID-19 positive individuals**

A meta-analysis based on the studies conducted in China, found that non-pharmacological interventions (such as alterations in COVID-19 appropriate behaviors, hospital-based prevention control measures and modification of the home-based environment) were effective in reducing the anxiety (SMD: -1.40, 95%CI: -1.62, -1.17), and depression (SMD: -1.22, 95% CI: -2.01, -0.43) among COVID-19 positive individuals.

iii. **Early identification, providing necessary mental health care and treatment through professionals:**

During an outbreak, individuals with pre-existing mental health conditions, older adults, people with substance abuse where the condition is exacerbated, and in certain cases the general population, need urgent intervention by a medical practitioner.

Population screening can be employed to identify high-risk groups to address their needs and make possible early recognition of mental health disorders, including subclinical or minor disorders. Wherever possible, online surveys can be conducted to screen people in need. HCWs can practice empathy, provide person-centered care and regular assessment of the psychological symptoms while managing delirium in patients hospitalized in intensive care units.

Upon identification of mental health disorders, counselling and referral can be advised. Counselling and treatment can be ascertained through digital medium via video calls and e-consultation. The COVID-19 pandemic has paved a way for widespread use of digital psychiatry, digital interventions, virtual care/web-based counselling, at-home neuro-therapeutics and self-administered brain stimulation.

Smartphone based e-interventions are useful in delivering tele-health consultation and more specifically telemedicine and tele-psychiatry emergency services. Therapy-derived interventions such as CBT, mindfulness-based interventions, Acceptance and Commitment Therapy were found to be mild to moderate effective in lowering stress, anxiety and depression.

iv. **Health system strengthening and capacity building:**

Individuals living in low- and middle-income countries are facing shortage of mental health resources such as trained manpower and infrastructure. For example, in India currently there is one psychiatrist for more than 125,000 individuals, whereas the ideal ratio should have been at least 1:8000. A similar situation can be found in other countries belonging to the global south. There is an immediate need for capacity building of primary health care professionals in mental health care and for solidarity and cooperation between private, government, NGOs and other philanthropic organizations to address the mental health assistance and support.

**Discussion**

This review is based on the existing literature from the past 10 years on interventions for common mental health disorders associated with an infectious disease outbreak. Most of the information is based on the COVID-19 pandemic and is generated from the literature published globally. In the past, humankind has managed to overcome emerging and re-emerging deadly virus or bacterial infectious illnesses, such as Nipah virus, Plague, SARS, Ebola and others, but the arrival of COVID-19 has created havoc across the entire world.
Based on previous knowledge of infectious diseases outbreaks, a series of stringent control measures have been practiced. These measures affected the mental health of individuals living in containment zones and primary or secondary contacts of the infected patients. Through this review, various types of common mental health disorders and associated factors were identified among various population sub-groups. Confusing or fake messages shared on social media, financial losses or loss of jobs, conflicting messages from authority, and lack of protective gear for HCWs contributed towards anxiety and fear. Furthermore, in many developing countries, inadequate or absence of mental health support system and trained mental health practitioners resulted in amplification of the issue.

First-aid psychological intervention, using social media/online platforms, to convey precise information from a credible source was found to be of utmost importance. This review also sheds light on interventions based on self-coping strategies, such as psychological self-care, mindfulness and developing resilience. Additionally, our review highlights the necessity of introducing interventions such as tele-medicines, tele-psychiatry and digital health to directly cater to vulnerable populations. Preventive strategies at the workplace and solidarity by colleagues were also found to be effective in lessening the mental health disorders experienced by essential working staff.

Recommendations and implications for policy and practice in South Asian countries during the second wave of COVID-19

Lately, due to the second wave of the COVID-19 pandemic, South Asian countries specifically India, faced a mammoth public health crisis. With overburdened health systems and inaccessibility to primary health care, the impact of the COVID-19 second wave was devastating in these countries. In this scenario, and since the entire world is experiencing or expecting a third wave of the pandemic, the importance of providing adequate interventions for both short-term and long-term common mental health disorders should be a priority. Based on our review findings, we have tried to propose few recommendations:

a. **Information education and communication via use of mass media:**

   • There is an acute need for timely and accurate information on the status of mental health disorders, and the point of contact in case of any emergency due to the public panic in many countries. Although technology has its own disadvantages, it is a boon to provide the timely information during such public health emergencies. However, there should be stringent regulations on controlling the content of the information to avoid fake messages.

   • Designating frontline workers such as HCWs and policy personnel to provide information and for conducting mass awareness campaigns via loudspeakers, and distributing pamphlets for the general and vulnerable populations, who are under lockdown and who require mental health services. During these campaigns, information about symptoms such as anxiety, and stress associated with ‘social isolation’ or COVID status, can be provided. These campaigns can focus on linking the vulnerable population to the appropriate mental health care facility.

   • Frequency of mass-media campaigns via television, radio shows, internet applications, should be increased. During these unprecedented times, these programs or short videos should focus on normalizing common mental health disorders and should target alleviating the stigma related to mental health disorders. Such short audio-visual campaigns should provide awareness to the general population about early identification of common mental health disorders and seeking appropriate mental health care. These videos can provide information on basic mindfulness activities for children and adults and should be able to link the vulnerable population to the health care facility via helpline numbers.

   • This review recommends behavior change communication strategies as one-time information may not be sufficient (considering the emergence of novel illnesses and multiple waves of epidemics), to upgrade the knowledge of illness and to see effective changes in behavior.

b. **Preparing workforce for community and grassroot level:**

   • Authorities can identify volunteers or community workers to tackle the needs of vulnerable populations such as older adults and individuals having disabilities. Containment of the spread of infection should be through physical or spatial distancing and not ‘social isolation’. Encouragement for increasing social connectedness must be done via telephone or video calls.
We recommend infectious disease epidemic recovered cases (such as COVID-19 patients) or ‘corona warriors’ to come forward to volunteer and help general population and others to overcome fear and panic.

Identification of community health workers at primary health care level, who can provide basic psychological counselling to people and refer patients to tertiary centers, if needed.

HCWs (or community-based health workers) should be trained to understand the nature of mental health disorders, severity and identify psychological first aid or referral options.

c. Preparing the health care system for identification and treatment of pandemic related mental health disorders:

Building an inter-linked ‘doctor-patient-psychologist’ network. This network should make sure that every symptomatic person who approaches the doctor, is linked to a psychologist (via the doctor). The psychologist must have the data of all the COVID-19 patients, so that appropriate pre-test and post-test counseling can be given to the patients and caregivers, at regular intervals.

HCWs should be attentive and screen for mental health disorders among the hospitalized individuals especially those who had history of such disorders or individuals with existing chronic diseases. HCWs can use commonly used, validated, and culturally sensitive screening tools in routine practice.

Building the psychological or mental health cadre. Mandatory representation of psychologists and psychiatrists in the government COVID-19 task forces.

Mental health experts involved in the COVID-19 task forces should be contacted to prepare a roadmap for management of long-term mental health disorders, anticipated as a result of the current wave, and pre-planning for management of successive waves of the dreadful pandemic.

There is a need for strong call for coherent inter-sectoral collaborations to develop care pathways that support integrated mental health care delivery across primary, secondary and tertiary care. Services can also be provided to patients at home (or via digital mode) and beyond working hours.

d. Ensuring public private partnership as a useful resource during the pandemic:

Encouraging public-private partnerships i.e., use of private psychiatry practitioners and psychologists so that their services can be availed in the government setting viz. primary health care level. Also, government partnerships with prominent private and non-governmental organizations that work on mental health at ground level can help in identifying patients who need the support and linking them to appropriate healthcare facility.

Various organizations have come up with psychological first aid management frameworks and models, such as by John Hopkins\textsuperscript{136} and the ‘Mental health surveillance system’.\textsuperscript{103} Such models or approaches can be contextualized by the countries and regions based on the available resources and context of the region. These models can be customized to front-line HCWs, people having infectious diseases and their caregivers and general population as the mental health need may differ.

Resource pooling and continuous flow of funds to tackle the infectious diseases, mental health disorders associated with infectious diseases epidemic and healthcare systems strengthening should be a priority.

Government and other organizations may look for solutions for the daily needs of these individuals who work in unorganized sectors.

Strengths and limitations of the review

We conducted a comprehensive search in five major databases, therefore we anticipate that we have captured most of the literature. However, this review has some limitations. Randomized controlled trials provides strong evidence of effective interventions but are not feasible options in public health emergencies. Also, the studies that were included in the systematic review were heterogeneous and some studies collected data via online surveys. Additionally, the search was restricted to English publications. Due to limited availability of evidence on effectiveness of interventions, we could not synthesize the most effective interventions, rather have summarized it thematically. We did not independently screen full
texts, extracted data and have not critically appraised the included studies for the risk of bias. Considering aforementioned limitations, we call for urgent high-quality research to find the most effective interventions for the psychological problems amidst infectious disease outbreaks so that it can be translated into action to tackle these issues during COVID-19 and in future emerging and re-emerging infectious disease illness.

**Conclusion**

This review has summarized the literature on the range of interventions to ease out the psychological problems during infectious disease outbreaks. The available literature is mostly from systematic reviews of heterogeneous studies. There is immediate need for collective actions through inter-sectoral collaborations at community, national and international level. Various organizations have prepared emergency strategies to tackle psychological problems, which can be contextualized by each country, however, during COVID-19 the focus is more on containing the spread of the infection.

**Data availability**

**Underlying data**

No data is associated with this article.

**Extended data**


This project contains the following extended data:

- PubMed search string
- Predicting factors associated with common mental health disorders amid infectious disease outbreak

Data are available under the terms of the Creative Commons Attribution 4.0 International license (CC-BY 4.0).

**Acknowledgements**

We would like to acknowledge Public Health Evidence South Asia, Prasanna School of Public Health, Manipal Academy of Higher Education, Manipal, for the logistics and administrative support. We are grateful to Dr. Lakshmi Balraj, PhD scholar, Department of International Health, FHML, CAPHRI, Maastricht University for running the search in PsychInfo and trying to trace non accessible articles.

**References**


Page 13 of 17


The benefits of publishing with F1000Research:

- Your article is published within days, with no editorial bias
- You can publish traditional articles, null/negative results, case reports, data notes and more
- The peer review process is transparent and collaborative
- Your article is indexed in PubMed after passing peer review
- Dedicated customer support at every stage

For pre-submission enquiries, contact research@f1000.com