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Psychosocial impact of COVID-19

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ABSTRACT

Background: Along with its high infectivity and fatality rates, the 2019 Corona Virus Disease (COVID-19) has caused universal psychosocial impact by causing mass hysteria, economic burden and financial losses. Mass fear of COVID-19, termed as “coronaphobia”, has generated a plethora of psychiatric manifestations across the different strata of the society. So, this review has been undertaken to define psychosocial impact of COVID-19.

Methods: Pubmed and Google Scholar are searched with the following key terms- “COVID-19”, “SARS-CoV2”, “Pandemic”, “Psychology”, “Psychosocial”, “Psychiatry”, “marginalized”, “telemedicine”, “mental health”, “quarantine”, “infodemic”, “social media” and “internet”. Few news paper reports related to COVID-19 and psychosocial impacts have also been added as per context.

Results: Disease itself multiplied by forced quarantine to combat COVID-19 applied by nationwide lockdowns can produce acute panic, anxiety, obsessive behaviors, hoarding, paranoia, and depression, and post-traumatic stress disorder (PTSD) in the long run. These have been fueled by an “infodemic” spread via different platforms of social media. Outbursts of racism, stigmatization, and xenophobia against particular communities are also being widely reported. Nevertheless, frontline healthcare workers are at higher-risk of contracting the disease as well as experiencing adverse psychological outcomes in form of burnout, anxiety, fear of transmitting infection, feeling of incompatibility, depression, increased substance-dependence, and PTSD. Community-based mitigation programs to combat COVID-19 will disrupt children’s usual lifestyle and may cause florid mental distress. The psychosocial aspects of older people, their caregivers, psychiatric patients and marginalized communities are affected by this pandemic in different ways and need special attention.

Conclusion: For better dealing with these psychosocial issues of different strata of the society, psychosocial crisis prevention and intervention models should be urgently developed by the government, health care personnel and other stakeholders. Apt application of internet services, technology and social media to curb both pandemic and infodemic needs to be instigated. Psychosocial preparedness by setting up mental organizations specific for future pandemics is certainly necessary.

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1. Introduction

Human civilization probably is passing through the most critical juncture of this millennium while its existence is being challenged

by the emergence of a novel severe acute respiratory syndrome coronavirus (SARS-Cov-2) encroaching newer territories all over the world expeditiously [1]. The 2019 Corona Virus Disease (COVID-19) outbreak has been declared an international public health emergency on January 30, 2020 by the World Health Organization (WHO) as the disease, first reported from China in December 2019, continues to surge through the continents affecting many countries from Europe, America and Asia severely and is still widening its burden of disease [2]. A wide fragment of world's population currently is primarily restricted to their homes, owing to nationwide lockdowns and home-confinement strategies implemented in the majority of the COVID-19-hit countries after China to prevent further disease transmission [3,4]. This unpredictable, fast spreading infectious disease has been causing universal awareness, anxiety and distress, all of which according to WHO are natural psychological responses to the randomly changing condition [5]. Adverse psychosomatic outcomes among common people are nevertheless expected to increase significantly due to the pandemic itself and also due to constant flow of readily available information and reinforced messaging obtained via online social networking services of almost all forms. As a consequence, rapidly expanding mass hysteria and panic regarding COVID-19 may beget enduring psychological problems in public from all the socioeconomic domains, which could potentially be even more detrimental in the long run than the virus itself [6]. Prior studies elucidated that mental well-being had been heavily affected in this kind of global pandemic [7,8]. Therefore, it is imperative to determine the various possible ways in which COVID-19 pandemic will be impacting the world's mental health [9–11]. In this background, we evaluate the relevant psychosocial consequences and impact of COVID-19 in various strata of modern society. (see Fig. 1)

2. “Corona positive”- a Stigma?

Disease-associated stigmatization among the sufferers from 2003 SARS outbreak was remarkably evident even after years of exposure, making it difficult for many when restarting the usual customs of day to day life [12–14]. Healthcare providers (HCP), particularly general practitioners, involved in SARS-affected patient care were found to be more prone to stigmatization [15]. Similarly,

the COVID-19 outbreak may also give rise to stigmatizing factors like fear of isolation, racism, discrimination, and marginalization with all its social and economic ramifications [14]. A stigmatized community tends to seek medical care late and hide important medical history, particularly of travel. This behavior, in turn, will increase the risk of community transmission. The WHO has also issued specific psychosocial considerations for abating the growing stigma of COVID [16]. Health crime originated out of the fear of being corona positive has also been reported from India [17,18].

3. Psychosocial burden of quarantine and isolation

COVID-19 has required many countries across the globe to implement early quarantine measures as the fundamental disease control tool [3]. Apart from physical sufferings, the consequences of this quarantine on the mental health and well-being at personal and population-levels are many fold. Imposed mass quarantine applied by nationwide lockdown programs can produce mass hysteria, anxiety and distress, due to factors like sense of getting cornered and loss of control. This can be intensified if families need separation, by uncertainty of disease progression, insufficient supply of basic essentials, financial losses, increased perception of risk, which usually get magnified by vague information and improper communications through media in the early phase of a pandemic [19–21]. Previous outbreaks have reported that psychological impact of quarantine can vary from immediate effects, like irritability, fear of contracting and spreading infection to family members, anger, confusion, frustration, loneliness, denial, anxiety, depression, insomnia, despair, to extremes of consequences, including suicide [21–25]. Suspected isolated cases may suffer from anxiety due to uncertainty about their health status and develop obsessive-compulsive symptoms, such as repeated temperature checks and sterilization [26]. Effects such as posttraumatic stress disorder (PTSD) have been reported, symptoms of which have been positively associated with the duration of quarantine [20,27]. Post quarantine psychological effects may include significant socioeconomic distress and psychological symptoms due to financial losses [21]. Another very important aspect is stigmatization and societal rejection regarding the quarantined cordon in forms of discrimination, suspicion and avoidance by neighborhood, insecurity

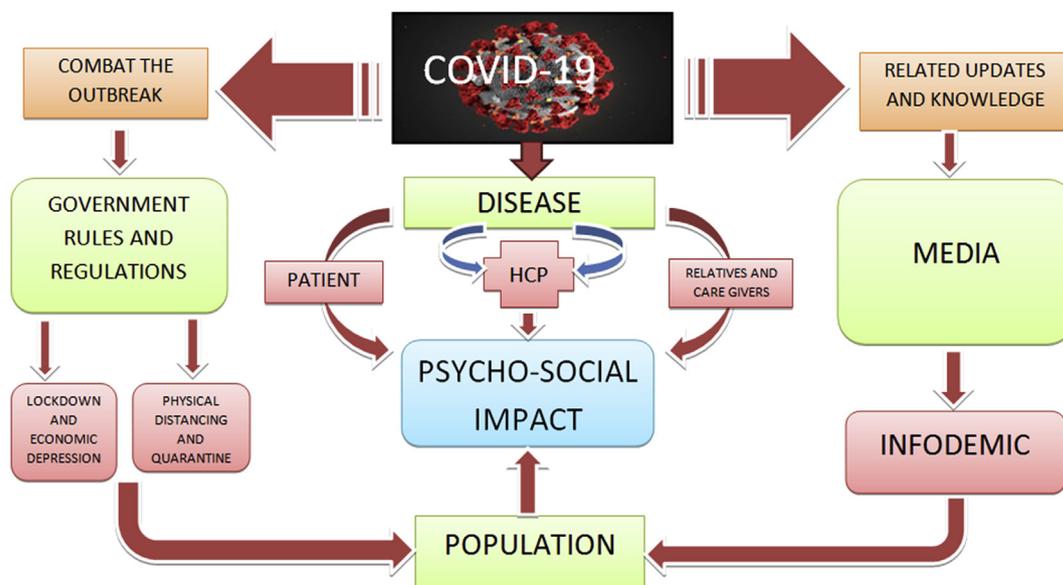


Fig. 1. Intricate psychosocial relationship between the disease, health care providers, government and population.

regarding properties, workplace prejudice, and withdrawal from social events even after containment of epidemics [21]. HCPs are also likely to perceive greater stigmatization than the general public for being quarantined and consistently more affected psychologically. Children who are (or suspected to be) infected with COVID-19 and need isolation or quarantine might require special attention to meet their fear, anxiety and other psychological effects [28].

Compliance to forced home quarantine is often being violated in India, unlike in other countries [29]. This must be taken with utmost care otherwise official acquiescence of such cordon will only aggravate such incidents. Eventually all these may result in social disobedience, irresponsible behavior, and low social perception. Critical analysis of these delinquent people's psyche needs further exploration. Altruistic behavior towards self-isolation and voluntary quarantine should be encouraged after proper clarification through mass communication to minimize distress and long-term complications of imposed quarantine [21].

4. Netizens, social media and COVID-19

"I predict that the next major outbreak — whether of a highly fatal strain of influenza or something else — will not be due to a lack of preventive technologies. Instead, emotional contagion, digitally enabled, could erode trust in vaccines so much as to render them moot. The deluge of conflicting information, misinformation and manipulated information on social media should be recognized as a global public-health threat." [30]

In recent times, enormous interconnections through online social networks (OSN) can potentially generate 'real-time maps' which should be considered important tools for tracking a pandemic and for making interventional campaigns when needed. But, new "info media ecosystems" of today's world, popularly termed as social media, can also have some disastrous effects on control and outcomes of an infectious disease pandemic [31]. Within days of onset of the COVID-19 outbreak in China, the 'social media panic' characterized by relentless plethora of fake information as well as negatively skewed misinformation metastasized faster than the coronavirus itself [6,32]. The director-general of WHO has referred this to "coronavirus infodemic" which is breeding fright and panic by laying out unchecked mind-boggling rumors, flamboyant news propaganda and sensationalism [33]. Mismatch between available fact sheets and dearth of clear-cut data can be compelling to entreat information from the unreliable and dubious but readily available social media sources. As soon as COVID-19 emerged to become a trending online content, many bloggers, groups or personal users in YouTube, WhatsApp, Facebook, Instagram and Twitter started the business of making a profit off COVID-19's popularity in many impulsive and unpredictable courses of action [34]. Since sensationally-charged and appalling contents draw the most attention and garner the most developments in social media, several users feigned COVID-19 symptoms to gain easy popularity and thus purposefully sowed mass confusion and panic [35]. These invite a number of overwhelming mental burdens in form of anxiety, phobia, panic spells, depression, obsession, irritability, delusions of having symptoms similar to COVID-19 and other paranoid ideas [36,37]. Health-care seekers are too much perplexed, catastrophized and morbidly worried about COVID-19 symptoms that the normal running of healthcare systems may get disrupted to address the mass anxiety owing to massive disinformation. These states of affairs certify the raw potential of social media during a public health disaster [36].

On the contrary, other groups in social media may take different

aspects of this disrupting disease too lightly to merge them with food items or politics or economic figures or any other irrelevant theme and display "caring a fig" attitude by creating, sharing and forwarding doctored memes, forged screenshots and corrupted links in the name of COVID-19 [35]. This might ignite the lamp of violation of basic pandemic rules and help people ignore the solemnity of pandemic, thus leading to oppositional activities and social disobedience. Therapeutic misadventures tried by lay people after being influenced by misleading social media messages are increasingly being reported [38,39].

From the inception of this COVID-19 pandemic, social media has played an integral role in the genesis of anti-Chinese sentiment across the globe [6,40]. Conspiracy theory, derogatory headlines about food habits, prejudiced comments regarding Chinese socio-cultural norms published in social media, and news outlets would culminate into discrimination, isolation of an entire nation and outburst of racism [41]. A long-term sustained stigma, shame, stress and multitude of mental health problems, including health crimes, might be the dire consequences of this irresponsible behavior of netizens and media-houses [42]. HCPs along with mass media should take the responsibility for providing the correct information and creating an effective communication with the citizens to curb this "infodemic" and mitigate the risk for their inappropriate behavior [32].

5. Psychosocial impact on health-care providers and other frontline workers- heal the healers

The psychosocial response of frontline workers during a pandemic is complex and incompletely understood. Studies regarding the 2003 SARS outbreak from Canada, Taiwan, and Hong Kong have discussed how the battle against SARS led to huge psychological morbidity amongst frontline HCPs [43–45]. During the 2003 SARS outbreak in Taiwan, nurses working in the SARS unit suffered from more depressive symptoms and insomnia compared to those from non-SARS units and occurrence of psychiatric symptoms was associated with direct exposure to SARS patient care [46]. Even after three years of SARS outbreak in 2003, a significant number of the related hospital workers in Beijing, China experienced some PTSD [47].

Similarly unavoidable stress, fear and anxiety about a poorly known contagious disease outbreaks, like COVID-19, can be profound among the higher-risk groups, such as HCPs and other frontline workers, including bankers, policemen, armed forces etc. Being exposed to the COVID-19 cases in hospitals, being quarantined, the death or illness of a relative or friend from COVID-19, and heightened self-perception of danger by the lethality of the virus can all negatively impact the mental well-being of health workers [47–49]. Medical professionals from heavily COVID-infected countries, like China, experienced huge performance pressure, as well as increased unfavorable psychiatric outcomes owing to sudden surge of overwork, inadequate protection from contamination, frustration from failure to give optimal patient-care, and isolation [50,51]. Various types of psychologically stressful events associated with "vicarious traumatization" amongst the nursing staffs have been reported during the spread and control of the COVID-19 pandemic in China [52]. In the developing countries like India, where the health care system is already overburdened, surges of COVID-cases are likely to provoke acute anxiety, irritation and stress among doctors and nurses. This might be compounded by the inadequate hospital supply of required hand hygiene tools [53] and significant shortage of personal protective equipment (PPE) among HCPs, who are at the highest risk of transmission [54]. Li et al. in their nationwide study among HCPs working in fever clinics or treating COVID-19 patients during the 2019 coronavirus

outbreak showed that half of the responders identified at least mild depression and one-third reported insomnia whereas 14% of physicians and nearly 16% of nurses described moderate or severe depressive symptom. The researchers pointed out that being female and working in the frontline were direct and independent risk factors for developing abnormal stress symptoms [50]. Maunder et al. [19] showed that caring for fellow ill colleagues during the pandemic may heighten anxiety of hospital staffs regarding their competence and skills, making them more vulnerable mentally. On the contrary, 'nonessential' healthcare staff (who are not involved in direct care of patients with COVID-19 and thus have to stay at home for indefinite periods during lockdowns) may experience feelings of isolation and worthlessness with respect to their inability to effectively contribute to the present crisis. Addressing the psychological aspects, like fear and anxiety of critically ill COVID-19-patients, seems furthermore difficult and cumbersome as most of the hospitals and their staffs have scarce formal training on proper infection-control measures [55] as well as behavioral and mental health interventions during and after infectious disease pandemics [56]. Health workers can find it extremely difficult to deal with the dismayed, uncooperative, panic-stricken and stigmatized patients of COVID-19 as already experienced by medical teams in China [51]; and this may generate apathy and withdrawal among clinicians. Many of the HCPs directly related to care of confirmed/suspected COVID-19 patients are being isolated and quarantined. Remaining separated from family during an infectious disease outbreak may exact an enormous emotional toll on HCPs. Those who are performing hospital duties on a day-care basis and have to return to home are at increased risk of developing profound anxiety regarding the fear of transmitting the disease to their own family members [54], especially if there are elderly members with preexisting chronic illness having much higher risk of developing grave and unfavorable outcomes. A sense of vulnerability may arise among clinicians due to lack of definitive therapy and preventive vaccines, uncertain incubation period of the virus, as well as its possible asymptomatic transmission. Being incompletely supported by government due to deficiency of PPEs [57], feeling of worthlessness due to lack of training in proper infection-control procedures, and isolation [58] can cause significant burnout and withdrawal among HCPs resulting in increased substance-dependence behaviors, leading to considerable functional impairment [19]. News of assault on doctors after deaths of COVID-19 patients [59] and eviction of resident physicians from their rented houses [60,61] amidst the ongoing pandemic are being reported. Emotional breakdowns following these disgraceful episodes could trigger common psychiatric illnesses in the short- and long-terms [62]. Additionally, the competency and mental health of newly employed fast tracked medical students/residents to overcome the man-power shortages should be monitored with utmost care [63,64]. Needless to say, proper psychological well-being of the HCPs in this vulnerable time is absolutely essential [65].

6. Effects on different sections of society

6.1. Children

Probably a very crucial, but apparently overlooked issue is the psychological impact of COVID-19 outbreak on toddlers and adolescents [66,67]. Developmental psychology researches largely founded that learned experiences through environmental factors during early childhood engender the fundamentals for lifetime behavior and success as it is a crucial phase for cognitive, emotional and psychosocial skill development [68]. During a severe pandemic like COVID-19, community-based mitigation programs, such as closing of schools, parks, and playgrounds will disrupt children's

usual lifestyle and can potentially promote distress and confusion. Both young and older children are likely to become more demanding, having to cope up with these changes, and may exhibit impatience, annoyance and hostility, which in turn may cause them suffering from physical and mental violence by overly pressurized parents. Stressors, such as monotony, disappointment, lack of face-to-face contact with classmates, friends and teachers, lack of enough personal space at home, and family financial losses during lockdowns, all can potentially trigger troublesome and even prolonged adverse mental consequences in children [66]. The interaction between their daily-routine changes, home confinement, and fear of infection could further intensify these undesirable mental reactions resulting in a vicious cycle [66,69]. A study [70] from Europe showed a significant correlation between parents' and children's fears regarding H1N1 swine-flu pandemic of 2009. It also revealed remarkably positive correlations between children's fear reactions about the disease and H1N1-related threat information obtained from their parents and other media [70]. In the same way, children at this time of COVID-19 may develop phobia, PTSD etc after learning risk information and other worrisome details through audio-visual media, including social media [66,71]. Children parented by single mother/father, including health care workers (HCW) taking care of COVID-19 patients may suffer from adjustment difficulties if their parent needs to be quarantined [19,72]. Momentary or sustained parent-child separation may make the child nervous due to worry for themselves or the lives of their loved ones and give rise to prolonged psychological impact.

While online classes and assignments have been the only effective way for continuing education at this situation, experts have already cautioned about being over-burdened. Specific psychological needs, healthy life-styles, proper hygiene advices, and good parenting guides can be addressed through the same online platform [66].

6.2. Old age

The notion that older adults and people with serious comorbidities are particularly vulnerable to worse outcomes from COVID-19 can create considerable fear amongst the elderly [71,73]. Other psychological impacts may include anxiety, irritability and excessive feeling of stress or anger [12,73]. Those older adults with cognitive decline may become much more anxious, agitated, and socially withdrawn, thus their specific needs demand specific attention [74,75]. Indoor physical exercise might be a potential therapy not only to maintain a robust physical health, but also to counteract the psychological impact in this trying time [76,77].

6.3. Domestic caregivers

Feeling overwhelmed or excessively concerned about COVID-19 can affect the ability and resilience of family members while caring for morbid patients at home as they were doing prior to the outbreak. The newly generated secondary traumatic stress (STS) reactions due to this pandemic may include fatigue, fear, withdrawal and guilt [78]. Members at home may feel it emotionally difficult if they cannot visit their sick relatives in the hospital due to strict lockdown situations [79]. On the other hand, family members coming to hospitals for their critically ill relatives/significant others who require emergency care and admission may have feelings of helplessness and vulnerability in fear of violating the social restriction rules, setting an example of "learned helplessness" [80].

6.4. Marginalized community- migrants, daily wagers, slum dwellers and prisoners

The vast majority of the world's refugees and international

migrant workers (IMW) are contained in those nations where public health infrastructure are already overstretched and in areas with the highest incidence of COVID-19, thus making these individuals disproportionately vulnerable to exclusion, stigma and discrimination [81,82]. IMWs generally have a high prevalence of common psychiatric disorders, like depression and a poor quality of life, which could further be jeopardized because of governmental-imposed quarantine and lost income during the COVID-19 [83]. Considering the lethal communicability of this disease, migrants, refugees and slum-dwellers are at heightened risk of contracting and spreading the infection [84]. Scarcity of sufficient, safe and affordable water supply makes these group of people fail to comply with basic hand hygiene regulations (which has been given utmost importance in control of COVID-19 outbreak as repeatedly emphasized by government as well as health originations) flaring up to their feelings of deprivation, neglect and segregation [85]. Furthermore, immigrants and refugees may even have to bear with the stigma of remaining as a speculated source of outbreak in a community where home-quarantine has been implemented [86]. A nation-wide study from China revealed that migrant workers had experienced the highest level of distress, which was significantly greater than all the occupations [85]. Incidences of death while migrating [86], mass chemical spraying over migrants [87], and quarantine on trees or boats [88] have been reported from India. This will definitely challenge the basic human rights for health and self-esteem which might sprout mass anger, disobedience and long-lasting psychological stigma. Slum dwellers may also experience constant fear of en-mass eviction during this pandemic owing to uncertain government policies [89]. Arguably COVID-19 has made the largest lockdown happen in the history of civilization that can severely enhance miseries of these migrant workers, daily wagers and billions of slum dwellers worldwide. Losing jobs leaves these individuals unable to make both ends meet and this sudden misfortune of income poverty adds to their guilt, frustration, depression and mental anguish, ultimately leading to functional impairment and increased rates of suicide [89]. Prisons are the epicenters of infectious disease, thus its health should be prioritized in the time of a pandemic. Their psychosocial needs, along with all the necessary preventive measures, must be addressed with utmost care [90].

6.5. General public

Previous studies have discussed an intense and wide spectrum of psychosocial ramifications that pandemics can inflict on the general population. Mass fear of COVID-19, rightly termed as “coronaphobia” [36], is likely due to the uncertain character and unpredictable course of the disease, intolerance of uncertainty, perceived risk of acquiring the infection etc and can generate negative psychological responses including maladaptive behaviors, emotional distress and avoidance reaction among common people [91]. During disease outbreaks, news of the first death, acceleration in number of new cases and expansive media attention can heighten people’s fears, frustrations, helplessness and anxiety over the situation. This results in misplaced health-protective and help-seeking behaviors by anxious public that may lead to conflicts between clinicians and patients, which can be harmful to epidemic control programs and hamper social stability [3,36,92]. Over-concerned public may worry about lockdown-related scarcity of emergency and essential services, and this non-realistic panic can lead to fallacious feelings regarding stockpiling daily essentials or resources (like hand sanitizer, medications, protective masks or even toilet paper). This “herd behavior” [93,94] can have a detrimental impact on a community that genuinely requires those essentials and may even promote unconcealed black marketing,

leading to social disruption and injustices [95,96]. Infection-related “xenophobia” tends to rise during epidemics and pandemics, as discussed previously, and sadly appears to be a common response in case of ongoing COVID-19. There are reports of verbal and physical attacks against Chinese people [40] and other “Chinese-looking” communities [97], and keeping them out from entry to healthcare and exercising basic human rights [36].

One study among more than 1200 subjects from almost 200 cities in China during months of January and February of 2020 noted that more than half (~54%) of respondents rated the psychological impact of the COVID-19 as moderate or severe; nearly one-third (~29%) reported moderate to severe anxiety symptoms; less than one 1/5th (~17%) reported moderate to severe depressive symptoms; and more than 75% of respondents experienced worry about their family members contracting COVID-19 [98]. Another large population based survey from China comprising almost 53,000 respondents found that more than 1/3rd (~35%) of the study-population experienced psychological distress ranging from mild to moderate (>29%) and severe (>5%) levels; using the COVID-19 Peritraumatic Distress Index (CPDI) score, which incorporates information namely ‘frequency of anxiety, depression, specific phobias, cognitive change, avoidance and compulsive behavior, physical symptoms and loss of social functioning’ etc [99]. Another study, based on the approach of Online Ecological Recognition (OER), analyzed Weibo posts from almost 18000 active Weibo users and determined that negative emotions, for example ‘anxiety, depression and indignation,’ have been increased after declaration of COVID-19 on January 20, 2020, while positive emotions, like happiness and life satisfaction, significantly decreased [100]. Female gender, young age, persons with higher educational status, being students, and having specific physical symptoms, like myalgias, dizziness, and coryza were significantly associated with more negative psychological effects of COVID-19 and higher levels of stress, anxiety, and depression among corresponding individuals [97,98,100]. Psychological distress levels have also been influenced by the huge amount of information at the fingertips coming via social media, affordability and supply of basic and medical resources, and effectiveness of the local public health systems [101].

A study [102] from Eastern India noted that majority of the responders felt worried about financial restraint during lockdown, almost one-fourth experienced depressive symptoms and one-third found it difficult to adjust with this “new normal”. More than half of the subjects were “preoccupied with the idea of getting infected with COVID-19”. 25.6% of the respondents found that COVID-19 had threatened their existence.

The amount of anxiety among college students during the COVID-19 outbreak in China was positively associated with hampered daily life schedules and delays in academic activities as affected by the lockdowns [103]. Long term lockdown causes unavailability of community services and collapse of many industries, leading to a negative impact on local and national economic stabilities [3,4]. Thus, a huge number of people develop financial losses or on the verge of unemployment, further intensifying the negative emotions experienced by these individuals during the COVID-19 pandemic [37]. Emergency medical services may also be affected by lockdowns due to lack of transportation facilities [104]. Whether nationwide lockdown possesses any positive impact on personal relationships, intimacy, birth rates, family bondings or emotions needs further research and exploration.

For people bereaved from the death of dear friends, colleagues, and loved ones due to COVID-19 and the inability to gain closure and cremate can result in anger, resentment, psychological trauma and long-term psychiatric sequelae [37,105]. Religious misbelief, disbelief and communal disharmony are major issues which may tarnish all the great ventures taken against the pandemic in India

[106]. Reports of increasing domestic violence and women abuse are being reported globally during this pandemic [107]. Distrust towards others in terms of disease spread and the government and healthcare services regarding their capability and efficiency to combat the disease might take its origin in this period [37].

7. Home-quarantine for “Homeless” populace- A paradoxical irony

Cities in countries such as India having large number of homeless population might face unique challenges while fighting against COVID-19 and addressing the issue of homelessness as they might exacerbate one another [108,109]. Many of the COVID-controlling measures targeted at the general public, such as self-isolation, increased hygiene, home-confinement, and strict social distancing are not feasible for homeless people [109]. Many of them suffer from chronic mental illness, substance abuse, difficulties in accessing affordable health care and higher mortality which might become exacerbated in this critical period. Lockdowns and disease containment procedures could be proven to be detrimental on the mental health of people experiencing homelessness, many of whom have anxiety and fright of forceful hospitalizations and imprisonments [109,110]. The protection of the rights of this unprivileged section of the society, providing them proper shelter and health-care should be addressed by the state and concerned non-governmental organizations (NGO) [110,111].

8. Effects on people with pre-existing psychiatric illness

Mentally challenged patients are substantially more prone to develop infectious diseases, such as pneumonia [112] and are at considerable risk of experiencing more negative physical as well as psychological outcomes during a potentially fatal epidemic like COVID-19. Cognitive decline, poor awareness level, impaired risk perception, and reduced concern about personal hygiene can increase the chances of acquiring infection in such individuals [113]. Additionally, social discrimination against mental ill health makes the management of patients with COVID-19 more challenging when psychological morbidities coexist [92]. Psychiatric patients are also prone to develop recurrences or deterioration of the pre-existing signs and symptoms. For example, individuals with known obsessive compulsive disorders (OCD) may practice frequent self-monitoring of temperature to check for fever; or may make several attempts to swallow saliva to check for throat pain as a symptom of COVID-19. Hand-washing being an anchor precaution to prevent COVID-19 transmission adds further to the misery of a known washer OCD patient. On the other hand, nationwide strict regulations regarding transport and quarantine can abruptly discontinue the therapeutic counseling schedules and impose utmost difficulties upon access of prescribed psychiatric medications [114]. Interestingly, individuals with ‘high health anxiety’ (likely patients of generalized anxiety disorders, somatization disorder, OCD) are more likely to misinterpret harmless bodily symptoms and feelings as the evidence of acquiring dangerous illnesses (for example, they may misinterpret benign muscle pain or coughing as a tell-tale sign of getting infected with COVID-19). This, in turn, may increase their anxiety and distress, influence their behavior and capacity of decision-making, and ultimately imposing unnecessary burden to public health care [92]. Children with underlying psychiatric illness might face newer challenges in this period due to breakdown of vital family support systems and networks [115].

9. Role of mental health-care workers

With the aim of better dealing with urgent and unmet

psychosocial issues of different population domains during this COVID-19 pandemic, a new psychosocial crisis prevention and intervention model should be developed with application of internet and appropriate technologies [116,117] with the central idea being to integrate all the health organizations, mental health authorities, government, tertiary care medical institutions and hospitals with their staff, medical practitioners, psychiatrists, psychologists, community physicians and social workers, as well to combine early intervention with later rehabilitation services [118,119]. Respective authorities must identify the high-risk groups for psychological morbidities during COVID-19 through proper screening, in-time referral, and promote early interventions in a targeted manner [120]. Specific attention needs to be paid for more vulnerable groups, such as quarantined people, HCPs, children, older adults, marginalized communities (include daily wagers, migrant workers, slum dwellers, prisoners, and homeless population) and patients with previous psychiatric morbidities (see Table 1 for further details).

It might seem appealing to allocate mental health professionals to work in other areas of healthcare to help with crucial manpower issues, but such a move would potentially worsen overall outcomes in physical and mental health during a disaster like COVID-19 [121]. Frontline HCPs involved in care of patients with COVID-19 cannot well address the psychological distress and related remedies of these patients because of factors like immense workloads and lack of standardized training for providing mental health care. Most of the cases, clinical psychiatrists, psychologists, and mental health social workers are not encouraged to enter isolation wards or confinement centers under strict infection control measures [10,122]. Therefore, a professional team comprising mental health physicians should be provisionally arranged on an emergency basis for proper guidance and direction to community HCPs regarding psychological issues amidst epidemic control that may potentially come into practice with the help of various online platforms. Healthcare institutions may very well consider respective psychiatric departments to provide supplementary daily-care sessions for mentally exhausted HCPs and the recovered patients from the COVID-19 disease [118].

Today’s self-centered, busier-than-ever human race could potentially appreciate home-confinement during COVID-19 as a mere opportunity to promote healthier parent-child relationships by correct parental strategies and strengthen family bonding by spending more quality times together with older parents/dependent members residing in the same household [66]. For populations in general, government should create real-time, online tracking maps regarding COVID-19 updates to alleviate stress, anxiety and confusion [118]. On the other hand, these groups must control the extent of information they are collecting to avoid mass panic, and have to be very aware of misinformation and disinformation continuously flowing through the social media. A comprehensive “information diet”-based approach is urgently needed to be delivered through traditional/online media after receiving proper training by health information professionals i.e. medical librarians [123]. In order to prevent discrimination and stigma around COVID-19, governmental agencies, political leaders, and healthcare authorities have to play an integral role for maintaining interracial concord during and after the pandemic [118].

10. Future directions and conclusions

Besides COVID-19, the 21st century is also the era of emerging pandemic of mental illnesses [124]. Thus, psychological and social preparedness of this pandemic carries global importance. The government and stakeholders must appreciate the psychosocial morbidities of this pandemic and assess the burden, fatalities and

Table 1
Psychosocial impact of COVID-19 on different strata of society and suggested interventions.

Social strata	Psychosocial issues	Intervention
COVID-19 positive patients and quarantined individuals	<ul style="list-style-type: none"> • Loneliness • Anxiety • Panic • PTSD • Depression 	<ul style="list-style-type: none"> ✓ Secure communication-channel between patient and family ✓ Delivery of progress-reports and discussion with families on further treatment plans through telephone, video-calls, whatsapp, e-mail etc. [56] ✓ Close monitoring of mental state of quarantined persons using tools like impact of event scale-revised (IES-R) and through smartphone technology [37] ✓ In-time referral ✓ Psychotherapy by stress-adaptation model [19] ✓ Psychiatric follow-up post-discharge, if needed
Health care providers	<ul style="list-style-type: none"> • Fear of worthlessness • Guilt • Overwhelming work-pressure • Deprivation of family while being in quarantine • Burnouts • Depression • Fear of infection and outcomes • Uncertainty • PTSD • Substance abuse • Boredom • Anxiety related to educational development • Irritability • Developmental issues • Fear of infection 	<ul style="list-style-type: none"> ✓ Support from Higher authority [54] ✓ Clear communication and regular accurate updates regarding precautionary measures [37,56] ✓ Sustained connection with family and friends through smartphone ✓ Shorter working duration, regular rest period, rotating shifts [37] ✓ Sufficient supply of appropriate PPE [65] ✓ Arrangements for well-equipped isolation wards specific for infected HCPs, insurance-system for work-related injuries [65] ✓ Long term psychological follow-up
Children	<ul style="list-style-type: none"> • Irritability • Developmental issues • Fear of infection 	<ul style="list-style-type: none"> ✓ Proper parenting ✓ Online classes, online study material ✓ Clear, direct, open and detailed information about disease transmission and precautionary measures ✓ Maintenance of sleep cycle, physical exercise schedule ✓ Educate about proper hygiene practice [66]
Old age	<ul style="list-style-type: none"> • Irritability, anger, fear, anxiety, cognitive decline • Deprivation from pre-scheduled check-up and/or follow-up sessions • Difficulties in accessing medicines due to travel restriction and lockdown 	<ul style="list-style-type: none"> ✓ Home-based physical exercise during quarantine [77] ✓ Sessions via telephone, online video-conference for physician guidance and mental health services [117,118] ✓ Essential drug-delivery system via online approach
Marginalized community	<ul style="list-style-type: none"> • Depression • Stress • Financial insecurity • Stigma of discrimination • Health crime 	<ul style="list-style-type: none"> ✓ Protection of basic human rights [109] ✓ Providing proper accommodation [109,110] ✓ Adequate food and waters supply from government and NGO [110] ✓ Affordable health care delivery ✓ Education about social distancing, hygiene ✓ Deploy mental health social worker to address specific need and referral to psychiatrists, if needed
Psychiatric patients	<ul style="list-style-type: none"> • Hampered routine psychiatric follow-up • Addiction • Violence 	<ul style="list-style-type: none"> ✓ Structured letter therapy [114] ✓ Counseling via telephone, online chat ✓ Online based psycho-reduction therapies [116] ✓ Proper supply of prescribed medications

associated consequences. Stigma and blame targeted at communities affected by the outbreak may hinder international trade, finance and relationships, instigating further unrest. Due care needs to be taken to erase the stigma associated with disease, racism, religious propaganda and psychosocial impact and needs to be implemented by regular discussion with trained and specialist health care personnel by making task force and execution teams who are directly engaged in health care delivery systems without creating any communication gaps between policy makers and ground level workers.

Setting up mental health organizations specific for future pandemics with branches in many nations and in individual healthcare institutions for research, mental healthcare delivery and arranging awareness program at both personal and community levels is desperately needed. Structured websites and toll free helpline numbers may be launched for alleviating psychological distress among the general public regarding this ongoing pandemic. Social media is to be used in good sense, to educate people on transmission dynamics, symptoms of disease, and time when exact medical consultations are needed. To protect social media from devaluations, strict government laws and legislation regarding fake news, social media rumors, disinformation and misinformation are to be implemented. The COVID-19 pandemic has clearly shown us how a “virus” can negatively impact our lives even in the 21st

century and simultaneously made us realize that the greatest assets of mankind are health, peace, love, solidarity, ingenuity, and knowledge.

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SD generated the idea which was further improved after discussing with MJD, RG, SC¹ and PB. First draft was conjointly written by SD, PB and RG. This was critically reviewed and revised by SC¹, MJD, SC², DL and CJL. All authors agreed upon the final form of manuscript before submission.

Declaration of competing interest

Nil.

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