



Stress, PTSD, and COVID-19: the Utility of Disaster Mental Health Interventions During the COVID-19 Pandemic

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Abstract

Purpose of review In the context of an ongoing, highly uncertain pandemic, disaster mental health measures can increase community capacity for resilience and well-being, support formal mental health treatment, and help address the risk for mental health reactions in high-stress occupations. The purpose of this review is to summarize the literature on disaster mental health interventions that have been helpful both prior to and during the pandemic in a broad range of applications, including for use with high-stress occupations in an effort to mitigate risk for post-traumatic stress disorder (PTSD) and other mental health sequelae.

Recent findings Evidence-based and evidence-informed disaster mental health interventions, frameworks, and treatments have been studied in pilot studies, non-randomized trials, and randomized clinical trials prior to and in the context of the current COVID-19 pandemic. The studies have demonstrated feasibility and acceptability of these modalities and improved perceived support, as well as significant reductions in distress, and mental health symptoms such as depression, anxiety, and PTSD.

Summary A disaster mental health approach to the COVID-19 pandemic can generate opportunities for prevention and support at multiple levels with timely interventions tailored for different concerns, cultures, and available resources.

Introduction

The COVID-19 pandemic has increased general awareness of the impact of prolonged intensive stress. In the context of an ongoing, highly uncertain sense of threat, the existing literature on post-traumatic stress is not sufficient to capture the range of possible anticipatory responses or helpful actions. The pandemic places the world in unique circumstances that call for flexible and creative ways to reduce pandemic-related distress and other mental health outcomes such as depression, anxiety, and PTSD. Public mental health measures are called for because the mental health impact

is widespread and varied (i.e., cost of health services, loss of manpower, loss of productivity and economic performance), and is potentially preventable in some contexts [1]. Public mental health strategies in prior disasters have resulted in promising progress [2, 3]. These interventions may increase community capacity for resilience and wellbeing, support formal mental health measures for extended public health crises characterized by ongoing threat, uncertainty and complexity, and help address the risk for mental health reactions in high-stress occupations.

The mental health impact of COVID-19

The need for a public mental health approach to the pandemic, in which a full spectrum of psychosocial support measures is provided, is driven by the increased numbers of people reporting stress reactions in relation to the COVID-19 pandemic. For instance, the most recent U.S. figures, gathered by the Center for Disease Control's Morbidity and Mortality Weekly report have indicated that during the period from August 2020–February 2021, the percentage of adults with recent symptoms of an anxiety or a depressive disorder increased from 36.4% to 41.5%, and the percentage of those reporting an unmet mental health care need increased from 9.2% to 11.7% [4]. Increases were largest among adults aged 18–29 years and those with less than a high school education. The US consensus pulse surveys for April 28–May 10, 2021, indicated that 35% of survey respondents reported depressive symptoms (7.6% nearly every day) and 40% reported anxiety symptoms (11% nearly every day). Ten percent of the respondents reported that they received mental health treatment, 15% indicated that they took prescription medication for behavioral/mental health, and another 7% reported that they thought they needed mental health counseling or therapy but did not get it [5]. In one study of those with pre-existing psychiatric disorders, female gender and high-stress responses seem to be indicators of risk in the context of the pandemic [6]. Quarantine has been shown to result in increased risk of developing mental health problems, particularly when associated with inadequate supplies; boredom; frustration; and a sense of isolation, insufficient or conflicting public health information, fears about personal health or infecting others, and socioeconomic distress or loss [7]. Direct exposure to the virus

creates an additional potential for grief and risk of stigmatization and rejection by others [8].

Recent meta-analyses focused on PTSD in coronavirus outbreaks have reported that the prevalence of outbreak-related PTSD symptoms was between 15 and 22% [9, 10]. In one meta-analysis, PTSD symptoms were reported by about 30% of those who had survived a coronavirus infection, 20% of health-care workers, and 10% of the general population [11]. However, a recent letter to JAMA by top PTSD experts notes that those conducting studies about COVID-19-related PTSD are not using a structured clinician-administered diagnostic interview which allows for more fine-tuned assessment of both criterion A and severity of PTSD symptoms. This might overestimate both the prevalence of PTSD and the need for intervention. The experts recommended longitudinal studies to ascertain the course of covid-related PTSD, to identify factors associated with PTSD, and to determine protective measures that can promote better outcomes [12]. These efforts might be supported when we are better able to utilize emerging biomarkers, multimodal early indicator assessment, and machine learning technology to increase the diagnostic accuracy of acute stress responses in order to prevent PTSD [13–17].

Medical practitioners and first responders may particularly be at risk for higher rates of PTSD, depression, anxiety, moral distress, and burnout [18, 19]. A recent meta-analytic review of 70 studies with 101,017 practitioners found the following estimated pooled prevalences: 30% anxiety, 31% depression, 56% acute stress, 20% post-traumatic stress, and 44% sleep disorders. The likelihood of having a clinically significant mental disorder has been associated with concern about infecting others, inability to talk with managers, stigma and unreliable access to personal protective equipment (PPE) [20]. A recent meta-analysis examining long-term mental health impact 1–2 years after the SARS outbreak noted that a higher rate of significant psychological distress and burnout, as well as a marginally higher number of probable PTSD (13.8% vs 8.6%; $p=0.06$) was present in those working with SARS patients compared to those who didn't. An increase in maladaptive behavior was also reported (21% vs 8.1%; $p<0.001$). High-risk unit staff had worse anxiety and depression 1 year after the SARS epidemic. Occupational exposure and perceived stigmatization were risk factors for adverse mental health outcomes [21]. Other frontline populations, such as food and hospitality workers, have also indicated concerns around the unknown, isolation, being infected and infecting others, and work and customer demands [22]. Essential workers in New Zealand reported that their key stressors were role overload, job complexity, time pressure, lack of support from management, poor team coordination, feeling unsafe at work, job insecurity, work-life conflict, customer incivility and reliance on technology [23].

Impact of the pandemic on mental health providers

The pandemic created an increased demand on the mental health workforce. For instance, the Institute for Health Policy and leadership reported that the disaster distress hotline had a 1,000% increase in the number of texts or calls in April 2020 compared with the same month in 2019 [24]. The online

therapy service Talkspace reported a 65–70% jump in clients at that same time, mostly dominated by COVID-19 anxiety [25].

The *New York Times* reported that mental health providers have experienced an increased demand for services and a resulting “disenfranchised grief,” defined as a sense of loss related to safety, goals, social connections, and activities, accompanied by a sense of not having a right to grieve these losses because others have it worse [26]. USA Today noted that mental health providers have reported a flood of new clients, an overwhelming need to train others, and increased demand to both help stressed coworkers and deal with tougher cases (i.e., more intimate partner violence, systemic racism, clients placing themselves at risk). Their workloads have resulted in teletherapy fatigue, and they have reported guilt regarding answers they could not give, people they had to turn away, potentially exposing loved ones to COVID-19, or for taking time off to recover from COVID-19. They also noted that they had lost their normal coping strategies, such as decompressing on the drive home, stopping to speak with colleagues between clients, and socializing with friends. Their ongoing needs included continued insurance coverage of telehealth services, and support from coworkers and their organizations (e.g., granting time off, respecting boundaries around taking on more cases, and providing better pay [27].

These findings were echoed in a sampling of mental health providers who responded to an online survey conducted in mid-2020. Eighty-two percent shared that the pandemic had negatively affected their ability to serve clients and their own mental health, in part because of limited access to social and emotional support. While they felt connected to clients because of shared experiences, they also reported feeling empathic distress and burn out, feeling overwhelmed and exhausted, and experiencing traumatic stress symptoms. Their experiences resulted in increases in depressed mood, anxiety, isolation, and fear. Many indicated teletherapy fatigue, decreased sense of clinical efficacy, dissatisfaction with work, and questioning the meaningfulness of their work [28]. Findings were similar in the UK, with mental health clinicians working with healthcare workers reporting both professional growth and vicarious traumatic stress. They were anxious and uncertain about how best to support their clients, felt professionally isolated, and tended to neglect their own health and well-being [29].

Disaster mental health–informed interventions and factors during the COVID-19 pandemic

In response to the many large-scale extended risk factors associated with the COVID-19 pandemic, a disaster mental health approach can provide both preventive and augmentative support for mental health providers and systems [30]. This is particularly salient because while effective treatment for mental health conditions like PTSD can alleviate suffering, engagement in that treatment is often low for many reasons, including perceived stigma, privacy concerns, distance, cost, lack of mental health providers, avoidance

associated with PTSD, or negative beliefs about psychotherapy [31–35]. When these obstacles are coupled with the additional barriers imposed by the pandemic, engagement in mental health treatment can be significantly hampered [36–38]. Similar to the way telehealth, electronic communications, and information technology aim to deal with common barriers to healthcare [39, 40], disaster mental health strategies during the pandemic aim to provide support and mitigate barriers to care [41–43].

One of the most common challenges imposed by large-scale public health crises is their impact on community capacity to provide psychosocial support or formal mental health treatment. Another challenge is that those experiencing distress and reduced functioning are often unlikely to seek mental health treatment. Low-intensity, evidence-informed skill-building models that can be delivered by lay professionals aim to ameliorate these challenges. For instance, in the immediate aftermath of disasters, prevention efforts such as psychological first aid (PFA) typically aim to promote safety, attend to practical needs, enhance coping, stabilize intense distress, and connect people with additional resources. They also identify and refer those at-risk for psychopathology [44]. While PFA research outcomes have been difficult to obtain, provision of PFA has yielded more rapid functional improvement in a sample of crime victims, and PFA training following a broad range of acute adversity has yielded greater sense of preparedness knowledge, self-efficacy, and understanding of appropriate psychosocial responses [45–47]. PFA has been utilized in many healthcare settings during the COVID-19 pandemic [48, 49]. So far, qualitative results have reported favorable response in these settings, with recommendations made for managerial support of staff PFA training, as well as time allowed for breaks, quality rest spaces, and access to peer support [49, 50].

More in-depth interventions which aim to coach individuals on the use of effective coping skills have also been applied in the aftermath of disasters. Interventions such as Skills for Psychological Recovery (SPR), Skills for Life Adjustment and Resilience (SOLAR), and Problem Management Plus (PM+) are different from PFA in that the PFA is designed to take place in the immediate aftermath of a disaster or adverse event, and the PFA provider is more likely to do things *for* a person (give advice, validation, reassurance, resources, etc.). In contrast, SPR, SOLAR, and PM+ are more likely to be implemented in the weeks and months after the initial threat has subsided, and the provider takes more of a coaching or training role as a way to empower people to better cope for themselves [51–53]. The low-intensity, collaborative culturally-scalable, and skills-building nature of these interventions improve reach via provision by lay professionals and typically are well-received. As with PFA, conducting controlled research with these interventions is challenging because of their flexible implementation and the chaotic nature of post-disaster settings. Empirical findings for these types of interventions have primarily been with providers, case studies, or have been qualitative in nature [54–58]. However, at least two randomized controlled trials with PM+ and SOLAR have found promising results in reduction of PTSD symptoms, anxiety, depression, psychosocial functioning, and self-identified problems, and further controlled research is underway to gather more support [59, 60]. Research with adaptations of PM+ and SPR for the pandemic is currently underway,

with preliminary results showing promising improvements in mental health symptoms [61, 62•, 63, 64•]. Highly accessible, scalable options such as these provide a feasible way to respond quickly to client needs and might therefore prove helpful for practitioners, supervisors, and organizations looking to meet the mental health needs of their communities.

The “five essential elements” framework for early and mid-term recovery in situations of ongoing threat has provided broader guidance about suggested actions to take in the pandemic because the elements are related to better recovery in a variety of ongoing adverse situations [65]. The elements are (a) *promoting a psychological sense of safety*, which can reduce biological aspects of stress reactions, positively affect cognitive processes that inhibit recovery, and reduce exaggerations of future risk; (b) *promoting calming*, which can reduce the anxiety that may generalize to other situations, interfere with engagement in life tasks, and increase risk for mental health disorders; (c) *promoting sense of self-efficacy* by increasing a person’s belief in their ability to endure through adverse events; (d) *promoting social connectedness*, one of the strongest research-based protective factors for better emotional well-being and recovery following adverse experiences; and (e) *fostering hope*, which is related to more favorable outcomes in a variety of adverse circumstances, via positive expectancy, a feeling of confidence in resources, faith, making meaning, or other hopeful beliefs.

Following disasters or public health crises, this type of broad, flexible framework is important because most of those affected are often overwhelmed and in need of a “map” that can guide them in through a variety of circumstances in a way that can be tailored to their existing capacity. It also allows for multiple strategies for recovery in those who are unwilling or unable to engage in more formal “processing” of their experiences until their life is more stable [66, 67]. This framework has been used in many settings since its inception and continues to guide program development during the pandemic [68–75]. It has broad applicability in part because it allows communities or systems to apply the relatively simple framework to plan programs public health messaging and program development, while at the same time giving permission to self-identify the most appropriate *specific* actions that best fit ever-changing contexts.

Disaster mental health–informed principles for high-stress occupations

Disaster mental health-informed approaches can play an important role in guiding ongoing support and being a bridge for more formal mental health support [30, 65]. This is particularly salient because while effective treatment for mental health conditions like PTSD alleviates suffering, engagement in that treatment is often low for many reasons, including perceived stigma, privacy concerns, distance, cost, lack of mental health providers, avoidance associated with PTSD, or negative beliefs about psychotherapy [31–35]. The EU Field Guide to Managing complexity (and chaos) in times of crisis, built

upon the Cynefin model for leadership and decision-making, recommends using a flexible approach in the context of complex public health situations such as the pandemic [76]. The Cynefin model suggests that for a system to be able to solve problems that it cannot yet anticipate, it needs to build informal networks based on trusted levels of working together, then create a level of “entanglement” across silos, whereby informal networks become channels of information and support. Informed actions can be based on what the system will permit (affordances), and patterns that naturally emerge in time via shared experiences (assemblages). It recommends taking a “lessons learning” approach to making sense of rapidly gathered feedback that can inform innovative attempts at solving problems. In essence, it allows a system to define and move towards doing “the next right thing,” which can often involve actions that have the “lowest energy gradient,” particularly in over-taxed systems. Frequent monitoring and communicating with others will also facilitate necessary next steps from moment to moment.

The Cynefin model recommends the use of research- or theory-informed frameworks to create an “endoskeleton” which empowers adaptive actions. Stress First Aid (SFA) is a self-care and coworker support model that operates in alignment with this recommendation. It was developed for those in high-stress occupations where values like selflessness, loyalty, a strong moral code, and excellence give strength but also potentially create vulnerabilities (e.g., prioritizing other’s need above one’s own) [3, 77–85]. SFA offers simple, practical actions to identify and address stress reactions in oneself and others in an ongoing way. It incorporates the five essential elements [65] (re-named to facilitate memory) and includes two additional components to support ongoing stress mitigation. The resulting seven functions of the SFA model are as follows: (1) *check*, check on self and others regularly; (2) *coordinate*, inform and coordinate with others, including referral to additional care as needed; (3) *cover*, increase both physical and psychological sense of safety; (4) *calm*, reduce physiological and emotional arousal with distraction, support, soothing, and replenishing; (5) *connect*, facilitate or restore social support; (6) *competence*, bolstering or restoring self-efficacy in occupational, well-being, and social spheres; and (7) *confidence*, restore self-esteem, confidence in others, meaning, and hope. It uses a stress continuum as its foundation to help reduce stigma, create a common language about stress reactions, and to recognize when SFA actions are needed. The stress continuum highlights that early awareness and response can bring a person back into a less severe stress zone before the need for more formal intervention. When leaders or departments use it as a shorthand way to discuss work stress, it can facilitate problem-solving and communication. When a person uses it to recognize the signs of stress in themselves or others, it can prompt them to be more disciplined about self-care or help them identify when to support a coworker. Figure 1

SFA has generally been well-received, in part because learning the basic framework does not take a lot of time. One of the core characteristics of the model is that the actions included within each element were derived from focus groups with members of the culture for which it was developed. This approach ensures that the actions are practical and feasible. It is also well-received because it was not designed to specifically prevent any particular disorder, but rather to enhance individual and system capacity to weather and

withstand adversity over time. Table 1 includes some of the suggested actions for each core function of SFA.

Because SFA is meant to be used in a very flexible way, empirical evaluation has been challenging. A firefighter study was conducted in 2014, which indicated that while stress indicators did not reduce significantly (possibly because initial stress levels were not substantial), the model was extremely well-received, and participants felt their departments were more prepared to provide stress mitigation and support [86]. Similar implementation trials in healthcare settings are currently underway (<https://www.pcori.org/research-results/2020/does-stress-first-aid-program-improve-well-being-among-healthcare-workers>). The SFA model will continue to incorporate data on healthcare worker coping and resilience factors during the pandemic such as organizational resources and support, self-efficacy, purpose, social support, positive emotions, non-engagement in maladaptive coping, individualized adaptive coping strategies, and general resilience identified [87–92], as described in Table 2 which is not systematic/exhaustive, but intended to support a recent review of the SFA targets in the context of the Covid pandemic.

The Stress First Aid model has circulated widely during the pandemic via articles, webinars, and SFA implementation materials on the NCPTSD website [93–96] (https://www.ptsd.va.gov/professional/treat/type/stress_first_aid.asp, <https://edhub.ama-assn.org/steps-forward/module/2779767>, <https://www.theschwartzcenter.org/webinar/caring-for-yourself-others-during-the-covid-19-pandemic-managing-healthcare-workers-stress/>, <https://thischangedmypractice.com/stress-first-aid-as-a-form-of-peer-support/>, <https://growthzonesitesprod.azureedge.net/wp-content/uploads/sites/799/2021/02/NMHCAITCStressFirstAid.pdf>). Typically, healthcare settings will implement Stress First Aid across the entire facility with 15-min briefings as a way to raise awareness and educate about the importance of regularly implementing SFA actions for stress mitigation. The organization then empowers SFA “coaches” with behavioral health experience to train, mentor, and provide resources for SFA unit leads and champions, who continue SFA-informed actions or trainings

READY (Green)	REACTING (Yellow)	INJURED (Orange)	ILL (Red)
<p>DEFINITION</p> <ul style="list-style-type: none"> Optimal functioning Adaptive growth Wellness <p>FEATURES</p> <ul style="list-style-type: none"> At one's best Well trained and prepared In control Physically, mentally, and spiritually fit Mission-focused Motivated Calm and steady Having fun Behaving ethically and legally 	<p>DEFINITION</p> <ul style="list-style-type: none"> Mild and transient distress or impairment Always goes away Low risk <p>FEATURES</p> <ul style="list-style-type: none"> Feeling irritable, anxious or down Loss of motivation Loss of focus Difficulty sleep Muscle tension, heightened heart rate, breathing, or other physical changes Not having fun <p>CAUSES</p> <ul style="list-style-type: none"> Any stressor / trigger 	<p>DEFINITION</p> <ul style="list-style-type: none"> More severe and persistent distress or impairment Leaves an emotional/mental "scar" Higher risk <p>FEATURES</p> <ul style="list-style-type: none"> Loss of control Panic, rage, or depression No longer feeling like normal self Excessive guilt, shame, or blame <p>CAUSES</p> <ul style="list-style-type: none"> Life threat Loss Inner conflict Excessive wear and tear 	<p>DEFINITION</p> <ul style="list-style-type: none"> Persistent and disabling distress or loss of function Clinical mental disorders Unhealed stress injuries <p>FEATURES</p> <ul style="list-style-type: none"> Symptoms persist and worsen over time Severe distress or social or occupational impairment Hopelessness <p>TYPES</p> <ul style="list-style-type: none"> PTSD Depression Anxiety Substance abuse

Fig. 1 The stress continuum model.

Table 1 Suggested SFA self-care and coworker support actions

SFA Function	Actions	Examples
Check	Self	<ul style="list-style-type: none"> • Give yourself permission to take care of yourself • Make a conscious effort to keep tabs on yourself • Become aware of your own personal indicators of Orange or Red Zone stress • When Orange or Red Zone stress indicators occur, take steps to mitigate them
	Others	<p>Ask yourself about your colleagues: Are they more sullen, withdrawn, frustrated, or irritable than usual? "I have noticed over the past few days that you seem lost in thought/quiet/frustrated/irritated."</p> <p>"As a coworker/friend/supervisor, colleague, I am concerned."</p> <p>"Help me understand what's going on. I would like to help if I can."</p> <p>"Thank you for trusting me enough to share that [issue]. I really do want for you to be comfortable in working together. I respect that you have a lot going on and your privacy. If not me, would you be willing to talk with [name two trusted resources]."</p>
Cover	Self	<ul style="list-style-type: none"> • Amplify safety plans and behaviors • Set healthy boundaries for yourself • Practice more helpful ways of thinking to foster healthy changes in behaviors
	Others	<ul style="list-style-type: none"> • Ask "Are you okay?" • Ask "Do you need help?" • Suggest an alternate, safer course of action • Forcefully command the person to stop • Hold up your own hands in a "stop" gesture • Keep pressure on the person's arm with one hand • Shake or nudge the person to get their attention • If necessary, protect the person from further danger
	Longer-term	<ul style="list-style-type: none"> • Work in pairs • Ask what feels unsafe and help to improve safety • Discuss lessons learned after unsafe situations and engage in problem-solving • Be a good role model for setting boundaries

Table 1 (continued)

SFA Function	Actions	Examples
Calm	Self	<ul style="list-style-type: none"> • Practice slow breathing to lower your heart rate • Pause for 15–30 s before making a major decision or responding to a new challenge • Be aware of and connect with your passion or priorities • Break down problems and concerns into manageable chunks and tackle them a little at a time, and consider asking for help some aspect of the process • Try to see things from a broader perspective
	Others	Calming in a stressful moment
		<ul style="list-style-type: none"> • Non-verbal actions • Be a calm presence • Maintain eye contact • Stay with the person • Give the person time to rest or take a break or asking for help to empower and distract them can give them time to compose themselves • Verbal actions • Give directive feedback such as, “take a deep breath and focus with me” • Coach in a breathing or grounding activity • Use the person’s name and communicate exactly what is needed in a calm, methodical voice
		Calming on an ongoing basis
Connect	Self	<ul style="list-style-type: none"> • Make others aware of the importance of self-calming strategies • Acknowledge possible stressors and the potential need for support in a matter-of-fact way ahead of difficult events—consider doing so through humor • Be a good listener to help your colleagues feel supported
		<ul style="list-style-type: none"> • Know the value of good mentors and friends • Discipline yourself to have conversations with people who know you well enough to when something is bothering you • Reprioritize your schedule to spend more time with those who mean the most to you • If conflict is occurring, use conflict resolution strategies
	Others	
	Assess social resources	<ul style="list-style-type: none"> • “Thanks for sharing that this is a difficult time for you and you’re not sure where to turn. Let’s think about who else can help at work and away from work?”
	Assess obstacles to social support	<ul style="list-style-type: none"> • “You told me about spending less time with family and friends. What is preventing you from reaching out to them?”
	Intervene to remove obstacles to social support	<ul style="list-style-type: none"> • For a team: “This is a tough situation, and we need to get on the same page. What are everyone’s concerns?” • For an individual: “There was an error, and we will work together to learn from this. What are you thinking right now?”

Table 1 (continued)

SFA Function	Actions	Examples
Competence	<p data-bbox="261 1623 282 1656">Self</p> <p data-bbox="477 1604 497 1656">Others</p> <p data-bbox="517 1612 537 1656">Stop:</p> <ul data-bbox="541 1173 608 1656" style="list-style-type: none"> • Make sure there is time given to rest and to recover if needed • Identify challenges to functional capabilities • Do not keep doing what is not working <p data-bbox="627 1587 647 1656">Back up:</p> <ul data-bbox="651 1157 715 1656" style="list-style-type: none"> • Retrain and refresh old occupational, well-being, or social skills • Give training in new occupational, well being, or social skills • Help mentor, problem-solve, or explore new options <p data-bbox="724 1549 745 1656">Move forward:</p> <ul data-bbox="748 1056 810 1656" style="list-style-type: none"> • Provide practice in refreshed skills • Provide practice to perfect new skills • Assist in integrating back into duties and in finding new directions and goals 	<p data-bbox="301 573 322 856">When you are having a difficult time:</p> <ul data-bbox="325 226 459 856" style="list-style-type: none"> • Use positive self-talk • Don't be afraid to ask for help and guidance from mentors • Establish new relationships with those who have been through similar situations • Do something that is easy for you to give you a sense of accomplishment • Make a commitment to endure, using whatever coping skills work best • Clarify top priorities and focus on taking steps towards what is most important <ul data-bbox="517 201 810 856" style="list-style-type: none"> • "We need to pause. I can cover this. Take a 10-min break." • "The EHR is down. Take a break and step away from the keyboard. What do you need to get done?" • "You have been doing this a long time and it feels like everything changed in the last few months. What new skills or ways of thinking do we need now and going forward?" • "I am glad that you completed the communications training and are back to work. Remember that not everyone knows that you are trying to change." • I will check in with you to see what is and is not working; you can check in with me too."

Table 1 (continued)

SFA Function	Actions	Examples
Confidence	Self	<ul style="list-style-type: none"> • If you unfairly blame yourself for a challenging situation, use positive self-talk to reframe the way you look at the event • Remind yourself of other successful cases to boost confidence • Adopt a long-term perspective • Use small triumphs to build confidence • After particularly traumatic situations or losses, don't push yourself to "process" the situation in any particular timeframe • Use the wisdom gained from difficult experiences to reconfirm your values, make changes in your life, appreciate what you value or help others
	Others	<p>For an individual: "You said, 'It doesn't matter anymore.' What is the 'it?'"</p> <p>For a team: "Team, we have had a rough week. What does it mean to be a doctor, nurse, or a team member, given our experience?"</p>
	Determine needs:	
	Assess:	
	• Self-image	
	• Understanding of meaning of life events	
	• Level of trust in self and others	
	• Hope for the future	
	Connect with resources:	<p>For an individual: "I can see this past month has been a drain on you and you are exhausted. Here are some resources that we have that may help."</p>
	• Restore depleted physical, psychological, and social resources	<p>For a team: "The past month has been a drain for all of us. Physically, mentally, and financially, we have been hit hard. Some of us are pretty exhausted. Here are some of the resources that we have."</p>
	• Foster spiritual connections	
	Encourage growth:	<p>For an individual: "There was a bad outcome, and you are feeling bad; I get it. You are not 100% responsible for this. Let's take an honest look at what was and was not in your control. Now, let's think about what we will do differently in the future."</p>
	• Reduce excessive guilt or shame	<p>For a team: "Team, we have been talking about our challenges and the things that did not go well. Let's take a moment and talk about some of the things that did go well. Which of these do we need to make sure that we keep doing?"</p>
	• Promote forgiveness of self and others	
	• Establish new meaning and purpose	
	• Set new directions and goals	

in their units. They also regularly assess the unit's overall stress levels on the stress continuum and shape dialogue about the resources that exist to build resilience and capacity.

SFA implementation is consistent with qualitative findings from a Cochrane review regarding work-related resilience interventions in the context of disease outbreak [97]. Successful implementation of programs depends upon flexible interventions that are culturally appropriate and adaptable to local needs. Also important are effective communication, cohesion through networks, a positive learning climate where team members feel valued and a part of the change process, and sufficient time and space for reflective thinking and evaluation.

A public-facing version of SFA called Curbside Manner that was developed for fire and EMS [98] has been adapted for helping professionals working with those affected by adversity. It is now called "Person-Centered Stress First Aid for Patients, Clients, and Customers". It has been used in crisis counseling programs, hotlines, and healthcare settings in the context of the pandemic [99, 100] (<https://www.theschwartzcenter.org/webinar/caring-with-compassion-supporting-patients-and-families-in-a-crisis/>). The framework is the same as the model for self-care and coworker support, but the descriptive actions were derived from those who have worked in different public health settings. The suggested actions are meant to be used as needed and as time allows, in a natural, seamless way and only when they do not interfere with primary duties. Use of the same framework for both patient/customer support and self-care/coworker support reduces the learning burden for helping professionals who are also themselves affected by pandemic stress.

Disaster mental health–informed principles for more intensive responses to the pandemic

For more intensive pandemic-related mental health interventions, evidence-based clinical practice guidelines typically recommend manual trauma-focused psychotherapies with a primary component of exposure and/or cognitive restructuring [101, 102•]. Online, video teleconference, and mobile applications have also been endorsed for those who prefer to receive support virtually [103–108, 109•, 110, 111]. From a public health perspective, technological application of telehealth, mobile apps, and online treatment can increase engagement in early intervention, meet the specific needs of populations, be used at low or no cost by large numbers of people, and be implemented at the exact moment they are needed [112, 113].

In the context of multiple stressors at play during the pandemic, personalized approaches are also recommended to optimize choice and person-centered care [114–117]. Expert guidance on pandemic-related modification of PTSD treatment has included (a) using person-centered practices such as asking about and addressing current concerns and needs, (b) incorporating specific pandemic-related circumstances into exposure protocols (such as mask-wearing), (c) addressing pandemic-related moral distress and moral

Table 2 Resilience, post-traumatic growth (PTG) and coping with COVID-19 studies

Study	Population	Instruments	Sample size	Design	Time points	Findings
Lou NM, Montreuil T, Feldman LS, Fried GM, Lavoie-Tremblay M, Bhanji F, Kennedy H, Kaneva P, Drouin S, Harley JM. Evaluations of Healthcare Providers' Perceived Support From Personal, Hospital, and System Resources: Implications for Well-Being and Management in Healthcare in Montreal, Quebec, During COVID-19. <i>Evaluation & the Health Professions</i> . 2021 Apr 27:01,632,787,211,012,742	Nurses and physicians	Personal, hospital, and healthcare system supports and resources lists that may help manage their stress	64 nurses and 55 physicians	Survey	July 31 to August 15 2020	HCPs found the most useful resources for stress management were hospital, not personal resources HCPs who reported more support from hospital resources experienced fewer psychological distress symptoms and were less likely to quit Support from colleagues was noted as one of the most helpful institutional resources
Pietrzak RH, Feingold JH, Feder A, Charney DS, Peccoralo L, Southwick SM, Ripp J. Psychological resilience in frontline health care workers during the acute phase of the COVID-19 pandemic in New York City. <i>The Journal of clinical psychiatry</i> . 2020 Dec 29;82(1):0-	Healthcare workers	Survey	6,026	Anonymous email survey	April 14 – May 11, 2020	The following factors emerged as strong correlates of resilience: <ul style="list-style-type: none"> • Self-efficacy • Purpose in life • Social support • Positive emotions • Non-engagement in maladaptive coping (i.e., substance use)

Table 2 (continued)

Study	Population	Instruments	Sample size	Design	Time points	Findings
Shechter A, Diaz F, Moise N, Anstey DE, Ye S, Agarwal S, Birk JL, Brodie D, Cannone DE, Chang B, Claassen J. Psychological distress, coping behaviors, and preferences for support among New York healthcare workers during the COVID-19 pandemic. <i>General hospital psychiatry</i> . 2020 Sep 1;66:1-8	Physicians, advanced practice providers, residents/fellows, and nurses	Survey: asked participants whether they were currently engaging in any of six types of coping behaviors (e.g., exercise, meditation), with the option to describe other coping or stress reduction activities they were using	657	Cross-sectional web survey	April 9–April 24, 2020	Most common coping responses endorsed: Physical activity/exercise (59%) Faith-based religion and/or spirituality (23%) Yoga (25%) Meditation (23%) Talk therapy (26%) Virtual provider support groups (16%) Other (16%) None (14%)

Table 2 (continued)

Study	Population	Instruments	Sample size	Design	Time points	Findings
Montreuil T, Feldman LS, Fried GM, Lavoie-Tremblay M, Bharji F, Kennedy H, Kaneva P, Harley JM. Nurses' and Physicians' Distress, Burnout, and Coping Strategies During COVID-19: Stress and Impact on Perceived Performance and Intentions to Quit. <i>Journal of Continuing Education in the Health Professions</i> . 2021 May 10	119 healthcare providers	Brief COPE inventory which includes two general coping strategies: adaptive coping (active coping, planning, positive reframing, acceptance, humor, using emotional support, and using instrumental support) and maladaptive coping (denial, substance use, behavioral disengagement, venting, and self-blame)	119	Cross-sectional, descriptive, correlational design	July 31 to August 15, 2020	Maladaptive coping, but not adaptive coping, was directly associated with adverse psychological outcomes HCPs who used more adaptive coping strategies were better able to respond to adverse situations Common resilience factors for exacerbating distress were social support, communication, adaptive coping, and training A lack of early access to support (e.g., time and access to therapy, hobbies such as gym, and family and friends) can restrict the adoption of adaptive coping mechanisms and their deployment in managing stress, which can result in psychological distress and carry long-lasting consequences 9

Table 2 (continued)

Study	Population	Instruments	Sample size	Design	Time points	Findings
Lyu Y, Yu Y, Chen S, Lu S, Ni S. Positive functioning at work during COVID-19: Post-traumatic growth, resilience, and emotional exhaustion in Chinese frontline healthcare workers. <i>Applied Psychology: Health and Well-Being</i> . 2021 May 6	Healthcare workers	A modified version of the Posttraumatic Growth Inventory (PTGI; Wang et al., 2011) The Chinese version (Yu & Zhang, 2007) of the Ego-Resilience Scale (ERS)	40 doctors, 44 nurses, 13 medical technicians, 5 medical researchers, and 32 administrators	Survey	February 17–19, 2020 March 17–19, 2020 May 23 to 25, 2020	People with higher levels of resilience at Time 1 developed greater PTG at Time 2 The higher the resilience, the more likely PTG would be developed Resilience and PTG did not increase over time
Barzilai R, Moore TM, Greenberg DM, DiDomenico GE, Brown LA, White LK, Gur RC, Gur RE. Resilience, COVID-19-related stress, anxiety and depression during the pandemic in a large population enriched for healthcare providers. <i>Translational psychiatry</i> . 2020 Aug 20;10(1):1–8	Participants in online survey, enriched for academics and healthcare providers	21-item abbreviated version of a resilience survey: Self-reliance (3 items) Emotion regulation (5 items) Positive (4 items) and negative (5 items) relationship characteristics Neighborhood characteristics (4 items)	3042	Online Survey	April 6 to 15, 2020	Higher resilience scores were associated with less COVID-19-related worries And lower likelihood of meeting GAD or depression screening threshold

injury, (d) including mobile apps and telehealth in treatment planning, and (e) planning for potentially reduced capacity to engage in intensive treatment (https://www.ptsd.va.gov/covid/list_healthcare_responders.asp).

Another factor to be considered is the anticipatory anxiety and lack of certainty about the future that is inherent in pandemics. Research into reducing anticipatory anxiety related to terrorist threat has shown some success utilizing a five-session intervention that includes education about trauma reactions, relaxation exercises, prolonged and in vivo exposure, assistance in modifying unrealistic thoughts, evaluation of the absolute risk of being harmed, recognition of the benefits of accepting a level of risk in order to permit normal functioning, and relapse prevention. Significantly more of those in the intervention group achieved higher end-state functioning and reductions in complicated grief reactions compared to those in the treatment as usual condition [118].

Uncertainty distress and intolerance for uncertainty have been linked to heightened distress during the pandemic [119, 120]. Theories about this topic have hypothesized that aversive or traumatic experiences in early life can cause one to have trouble distinguishing “unsafe” or threatening situations from “objectively-safe-but-unknown” situations, resulting in an “intolerance for uncertainty” [121]. This then reduces the capacity to endure one’s own distress when there is a perceived absence of enough information to make a situation seem safe. Those who have trouble tolerating uncertainty may use the following strategies: (a) *over-engagement*, such as over-planning, preparation, or prediction; (b) *under-engagement*, such as avoiding preparing for something or not engaging in activities to reduce uncertainty-related discomfort; and (c) *impulsivity*, or acting impulsively, which leads to quick and less thought-out choices [122]. Behavioral treatment components related to intolerance of uncertainty aim to (a) teach about the effects of uncertainty and the difference between “uncertain” and “unsafe”; (b) target the “threat” component through cognitive restructuring; (c) increase awareness of preferred responses to uncertainty discomfort; and (d) “stretch” the capacity to experiment with uncertainty in a variety of areas of one’s life [122]. Experts on this topic are currently developing and testing a model to clarify how actual and perceived threat, actual and perceived uncertainty, and situation-specific tolerance for uncertainty can make unique contributions to variance in uncertainty distress [121].

Finally, when people are at a reduced capacity to engage in standard evidence-based PTSD protocols, disaster-related adaptations to standard CBT models may prove helpful. For instance, *Cognitive Behavioral Therapy for Post-disaster Distress* (CBT-PD) uses non-diagnostic psychoeducation and cognitive restructuring for a broad range of post-disaster reactions [123–125]. *Skills Training in Affective and Interpersonal Regulation/Modified Prolonged Exposure* (STAIR/MPE), which includes social and emotional regulation skills in addition to prolonged exposure protocols, has also been shown to be helpful following disasters and terrorism [126].

Models like these, as well as PM+, SOLAR, SPR and other brief skills-based approaches, offer present-centered skills-building options that provide flexibility, increase community capacity, reduce distress, and support resilience [51–61, 62•, 63, 64•, 127, 128] (Table 3).

Practical implementation considerations

The disaster mental health approach to dealing with the stress of the pandemic highlights the use of multiple strategies that are preventive and scalable to context and capacity. One of the primary reasons for this approach is the issue of multiple disaster-related barriers to traditional mental healthcare such as reduced help-seeking or capacity to engage in formal treatment, and insufficient community capacity. Specific strategies to counter these barriers to care could include:

1. Provide proactive supportive outreach and education to those affected by the pandemic, to normalize distress, help them be better informed about their top concerns, and foster actions or skills that facilitate recovery. Consider sharing these tips:
 - Seek out trusted information on how to protect health and well-being, be aware of early warning signs of illness, or prepare for a range of possible scenarios in order to increase sense of safety.
 - Build in calming actions, which can include:

Finding ways to reduce tension such as breathing exercises, meditation, exercise, stretching, yoga, prayer, music, writing in a journal, or spending time outdoors.

Engaging in satisfying or rewarding activities.

Reducing any unhelpful actions which seem to help in the short term but can make things worse in the long term, such as exclusive reliance on alcohol to relax, or excessive exposure to the news, particularly prior to sleep.

Table 3 Disaster Interventions Recommended for Covid-Related Contexts

Evidence-Informed Interventions

Self-Care and Peer Support in Organizational Settings

Stress First Aid [3, 77–87].

Community and Organizational Settings

Psychological First Aid (PFA) [44–50].

Five Essential Elements [65].

Person-Centered SFA for Patients, Clients, and Customers [104].

Skills for Psychological Recovery (SPR) [51, 54, 58, 64].

Skills-building Interventions

Problem Management Plus (PM+) [55, 59–63].

Skills for Life Adjustment and Resilience Program (SOLAR) [52, 55–57].

Cognitive Behavioral Treatment for Post-disaster Distress [123–125].

Skills Training in Affective and Interpersonal Regulation/Modified Prolonged Exposure (STAIR/MPE) [126].

Virtual / Online Settings

Covid Coach Mobile App (https://www.ptsd.va.gov/covid/list_healthcare_responders.asp).

Cognitive Behavioral Treatment delivered via telehealth or online approaches [103–111, 127, 128].

Practicing helpful, less extreme ways of thinking, with the goal of modifying thoughts so that they move from being just realistic (“bad things might happen”) to being realistic *and* helpful (“if bad things happen, I can handle them with help.”).

- Maintain connection with others by being flexible and creative, whether by phone, email, text messaging, or video calls. Consider getting guidance on conflict resolution, if needed.
 - Aim to boost self-efficacy (the feeling that one has the skills or resources to get through difficult times). It can be improved by seeking out advice or information to help in making decisions or taking actions. Also consider revising priorities and expectations, being patient with oneself and others, making concrete plans to mitigate stress reactions, and setting achievable goals.
 - Foster hope by modifying negative or unhelpful thoughts so that they are more helpful, or by keeping a long-term perspective while remaining focused on the positive actions one can take in the moment. Also remember to pay attention to what inspires or increases gratitude and make time for engaging in actions that support personal values, faith or spirituality.
2. Provide outreach to other service providers and systems (e.g., public health and health professionals, employee assistance programs, and volunteers), to support the integration of mental health principles into all phases of response.
 3. Offer a variety of flexible, present-centered, skill-building interventions such as CBT-PDD, PM+, SPR, SOLAR, or STAIR to those in need who may not have the capacity, resources, or desire to receive formal mental health treatment.
 4. Modify evidence-based treatment components to fit the context of the pandemic (e.g., asking about and addressing current concerns and needs, incorporating specific pandemic-related circumstances into treatment protocols, addressing pandemic-related moral distress and moral injury).
 5. Use technology to deliver of evidence-based and evidence-informed support and treatment.
 6. Incorporate ongoing self-care and coworker support interventions such as SFA into self-care and coworker support, or when working with high-stress occupations such as first responders and healthcare workers. A long-term approach includes regular self-checks and adjustment of self-care strategies based on stress level and current concerns. It is important to be adaptive and flexible based on what is happening, and regularly find ways to practice small healthy habits or set necessary boundaries. A big part of the process is sharing and learning from colleagues, consulting with mentors, and making time for the small actions that provide support.
 7. Evaluate any services that are provided, with an eye towards determining optimal timing, and optimal components to use. It will be particularly important to incorporate findings from studies that integrate multiple personal and organizational risk and resilience factors, adopt prospective designs and analyses, examine long-term patterns of mental health rather than cross-sectional prevalence rates, incorporate cultural/community factors and individual preference, and consider flexible adjustment strategies across the course of the pandemic [129–131].
 8. Use the five elements to guide conversations with existing overwhelmed clients, particularly if a present-centered and client-centered approach is indicated. It can be used to assess how clients have been affected by the pandemic, such as asking how the pandemic affected their: a) sense of safety, b) ability to sleep or remain calm, c) social support, d) feeling that you have the skills or resources to persevere, e) sense of hope, confidence, or meaning. It can also be used to help identify preferred coping strategies, by asking what best helps them to: a) feel safer, b) calmer, c) more connected, d) better able to cope, e) more hopeful or confident".

Conclusion

A disaster mental health approach to the COVID-19 pandemic can generate opportunities for prevention and support at multiple levels. It aims to improve safety, calming, social support, self-efficacy, and hope for individuals, families, organizations, communities, and policymakers. This approach calls for early and ongoing actions to be incorporated within a multi-disciplinary, multi-layered stepped-care approach. Any models should anticipate a variety of needs and provide personalized, flexible interventions. Many of the approaches described in this paper involve collaborative efforts aimed towards reaching larger numbers of affected individuals and communities with timely interventions tailored for different concerns, cultures, and available resources. Because research is so challenging in these contexts with such necessarily flexible approaches, testing of innovative data gathering approaches is recommended, such as streamlined real-time mobile applications. Generally, because these efforts are often utilized with sub-clinical populations, and unlikely to yield substantial gains, additional effort is needed to measure the effectiveness of these approaches in being a bridge for those in need of more intensive treatment for PTSD and other mental health conditions [132]. Given that the pandemic context is an extended public health crisis with multiple mechanisms for potentially traumatic stress and loss, it is expected that the longer it lasts, the more likely it is that rates of PTSD and complicated grief will continue to be elevated. Resources should particularly be allotted towards high-risk individuals, organizations, occupations, and communities, as well as towards determining which strategies will better persuade affected individuals to accept the resources and treatment that might help them recover more quickly and thoroughly [133].

Compliance with Ethical Standards

Conflict of Interest

Patricia J. Watson declares that she has no conflict of interest.

Human and Animal Rights and Informed Consent

All reported studies/experiments with human or animal subjects performed by the authors have been previously published and complied with all applicable ethical standards (including the Helsinki declaration and its amendments, institutional/national research committee standards, and international/national/institutional guidelines).

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