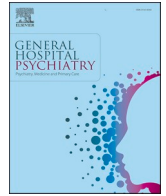




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The Stress and Resilience Town Hall: A systems response to support the health workforce during COVID-19 and beyond

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ABSTRACT

Objective: The COVID-19 pandemic is a traumatic stressor resulting in anxiety, depression, post-traumatic stress, and burnout among healthcare workers. We describe an intervention to support the health workforce and summarize results from its 40-week implementation in a large, tri-state health system during the COVID-19 pandemic.

Method: We conducted 121 virtual and interactive Stress and Resilience Town Halls attended by 3555 healthcare workers. Town hall participants generated 1627 stressors and resilience strategies that we coded and analyzed using rigorous qualitative methods ($Kappa = 0.85$).

Results: We identify six types of stressors and eight types of resilience strategies reported by healthcare workers, how these changed over time, and how town halls were responsive to emerging health workforce needs. We show that town halls dedicated to groups working together yielded 84% higher mean attendance and more sharing of stressors and resilience strategies than those offered generally across the health system, and that specific stressors and strategies are reported consistently while others vary markedly over time.

Conclusions: The virtual and interactive Stress and Resilience Town Hall is an accessible, scalable, and sustainable intervention to build mutual support, wellness, and resilience among healthcare workers and within hospitals and health systems responding to emerging crises, pandemics, and disasters.

1. Introduction

The COVID-19 pandemic has placed extraordinary demands on the health workforce and healthcare system [1,2] resulting in high levels of

anxiety, depression, post-traumatic stress, and burnout among healthcare workers [3–7]. Healthcare workers have witnessed high rates of morbidity and mortality caring for sick patients [8], faced persistent work-related stressors, such as increases in workload and disruptions in

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workflow [9,10], and encountered disparities in COVID-19 health impact for under-represented racial and ethnic groups [11–13]. Many healthcare workers have also been the targets of racial or ethnic bias from patients during the pandemic [14–16]. Like other members of the public, most healthcare workers have also experienced stress due to uncertainty about the prolonged course and impact of the pandemic [17,18], economic instability [19,20], and increased personal and family demands, especially women [21–23]. These intersecting stressors have prompted many healthcare workers to leave their profession [24,25], further straining hospital and healthcare systems that have had to respond to multiple pandemic surges [2,26,27].

In this paper, we describe an innovative and sustainable health systems approach to support the health workforce, the virtual and interactive Stress and Resilience Town Hall, in a large, academically-affiliated, tri-state health system during the COVID-19 pandemic. Specifically, we: 1) describe implementation of 121 Stress and Resilience Town Halls involving 3555 participants conducted during the first 9 months of the pandemic; 2) summarize the results of a rigorous qualitative evaluation of their implementation and impact; and 3) discuss the implications of this intervention for future healthcare crises, pandemics, and disasters. Our results indicate that there were six types of stressors and eight types of resilience strategies reported by healthcare workers, coded at a high degree of inter-rater reliability. Stressors and resilience strategies identified illustrate the potential value of this intervention to support the health workforce. We also report how implementation of the town halls changed over time in response to health system demands; specifically how different types of town halls were responsive to demands within particular departments, units, and teams to address changing health workforce needs. We conclude by discussing the implications of implementing interactive Stress and Resilience Town Halls as a promising vehicle for building mutual support, wellness, and resilience among healthcare workers responding to emerging healthcare crises, pandemics, and disasters that may place healthcare workers at increased risk for stress, burnout, and psychiatric disorders.

1.1. The stress and resilience town hall

Virtual and interactive Stress and Resilience Town Halls are part of a tiered institutional response to support healthcare workers in our tri-state health system during the COVID-19 pandemic [28]. Developed through a joint health system/academic medical center task force, each town hall is 45–60 min and facilitated by a faculty psychiatrist and/or psychologist to provide mutual support and psycho-educational resources to build resilience. Mutual support and psychoeducation are both evidence-based strategies shown to be effective in coping with stress and adversity [29,30]. The use of mutual support among the health workforce aligns with COVID-19 pandemic guidance published by the American Psychiatric Association Committee on the Psychiatric Dimensions of Disaster [31]. Each town hall begins with a brief (15 min) presentation about stress or resilience from one of the faculty facilitators, followed by an extended (30–40 min) interactive discussion among participants about their stressors and resilience strategies. In contrast to a lecture or a psychotherapy group, town halls are an opportunity for participants to provide and obtain mutual support by sharing stressors and resilience strategies experienced during the pandemic; facilitators encourage mutual sharing and affirm evidence-based strategies. Examples of town hall topics include: managing stress and building resilience; tips for dealing with anxiety and uncertainty; the power of routines in managing stress; leadership stress; balancing work/family challenges; and parenting stress during the pandemic. Over 20 faculty volunteers, diverse by gender, race, ethnicity, age, and academic rank, have facilitated town halls. To ensure consistency across town halls, the lead author developed a facilitator guide and faculty attended weekly implementation meetings to share experiences and contribute ideas for new town halls.

Town halls were conducted in a large, tri-state health system

consisting of the Yale New Haven Health System (YNHHS) and Yale School of Medicine (YSM). YNHHS is a nonprofit health system with over 27,000 employees that includes several acute-care hospitals, a children's hospital, a cancer hospital, several specialty clinics in Connecticut and Rhode Island, and a multispecialty medical practice group with over 130 community practices in three states (Connecticut, New York, and Rhode Island). The YSM is an academic medical center that employs over 31,000 faculty, trainees, and staff that work in YNHHS and in affiliated practice and research sites (e.g., Yale Medicine, the Veteran's Administration Connecticut Health Care System, the Connecticut Mental Health Center). YSM also operates the Yale Affiliated Hospitals Program, a collaboration with seven hospitals in Connecticut to train medical residents and other healthcare professionals. YSM also has close collaborations with Yale University schools and centers that employ faculty, students, and staff.

Initially, only “general” town halls open to anyone in the health system were conducted twice daily Monday–Friday for 2 weeks beginning March 2020. These initial town halls were well received and prompted a demand for “dedicated” town halls scheduled for specific departments, units, or groups throughout the system. Thus, over the course of 2–3 months, dedicated town halls supplanted general town halls, which allowed for tailoring content to specific groups and scheduling multiple town halls for a group across several weeks. Attendance at all town halls continues to be voluntary.

During the initial year of implementation, trained observers anonymously annotated stressors and resilience strategies shared during a town hall. Participants were informed about this when beginning a town hall and told that the town hall would not be electronically recorded so as to encourage open sharing of experiences.

2. Methods

2.1. Participants

We report data from 3555 healthcare workers and other staff, faculty, and students attending 121 interactive town halls conducted virtually using Zoom from March through December 2020. Participants were invited to participate in town halls through communications from YSM, YNHHS, and the Yale Department of Psychiatry, which also included links to a website of extensive resources on stress and building resilience at work and at home (<https://medicine.yale.edu/caregivers/stress>), as well as a brief, anonymous stress self-assessment survey that allowed individuals to track their own stress signs and symptoms and receive 1:1 consultation and support as needed. Town hall participants were anonymous, so specific demographic information on participants is not available, but participants in each town hall were shown the website of resources available to them as well as links to the survey. Data from this survey is likely an approximation of the demographic characteristics of town hall attendees as the survey was representative of health system employees, but there was no specific link between anonymous survey completion and attendance in a Stress and Resilience Town Hall. A total of 8886 individuals completed the survey during the period town halls were implemented; 79% were female, 20% male, and 1% non-binary/prefer not to answer; 12% were Latinx; 1% were American Indian or Alaskan Native, 7% Asian or Pacific Islander, 13% Black or African American, 68% White, and 12% other/prefer not to answer. The highest level of education completed was: 31% Associate's degree or less; 33% Bachelor's degree; 21% Master's degree; and 15% doctoral degree (MD, DO, PhD or equivalent). The primary health system/medical center affiliation of those completing the survey was: 85% healthcare workers, affiliated practice group staff, or private practice staff and 15% medical center faculty, students, or staff.

2.2. Data analyses

Institutional Review Board approval was obtained under exemption

status for coding anonymous qualitative responses by participants. Participant responses in the town halls were annotated by trained observers from the research team. Coding was conducted by two members of the team using the constant comparative method [32,33]. All statements were independently identified as either stressors or resilience strategies by each coder, with differences resolved by consensus for a statement to be included as a stressor or resilience strategy for subsequent coding. Only statements that reflected a specific experience for a given person was coded so that when two individuals in a town hall described the same stressor or resilience strategy, it was not coded twice. In addition, each response by a given individual was anchored in the entire context of what that individual shared when talking about their experience. These decision rules yielded a total of 1627 statements available for coding by both reviewers. Raters then developed initial codes for thematic types of stressors (6 types, $n = 835$ responses) and resilience strategy types (8 types, $n = 792$ responses), with differences discussed until consensus was achieved for thematic types to be included for final coding. Reliability was assessed using 10% of all stressors and resilience strategy codes, and Cohen's kappa across all codes was 0.85, indicating excellent reliability.

3. Results

3.1. Town halls in response to health system demand

As shown in Table 1(a), we conducted 70 general town halls and 51 dedicated town halls during the first 40 weeks of the pandemic in the region. Of 3555 attendees, 1521 attended general town halls ($X = 21.73$, $SD = 60.46$, $M = 10$) and 2034 attended dedicated town halls ($X = 39.88$, $SD = 108.07$, $M = 17$), indicating that mean attendance was 84% higher for dedicated town halls. As noted earlier, general town halls were open to anyone in the health system; participants who shared their backgrounds in these general town halls included nurses, physicians, residents, medical students, and a variety of allied health professionals and medical support staff. Dedicated town halls were also conducted throughout the health system but were delivered to specific departments, units, or teams within a given hospital or healthcare setting, or to specific professional groups, such as hospitalists, nurses, residents, or support staff. Dedicated town halls were delivered in response to a perceived need identified by leadership or in response to requests from healthcare workers to leadership for additional supports to promote well-being. In contrast to general town halls which involved single town halls on particular topics, dedicated town halls usually involved 2–4 sessions with the same group over a period of weeks or months.

Table 1
Types of stress and resilience town halls across four periods of the COVID-19 pandemic.

(a)				
Town Halls	Total	General	Dedicated	
Number of Town Halls	121	70	51	
Total Attendees	3555	1521	2034	
Mean	29.38	21.73	39.88	
(S.D.)	(83.96)	(60.46)	(108.07)	
[Median]	[11]	[10]	[17.0]	
(b)				
Town Halls by Period ^a	Hospitalizations ^b	Total	General	Dedicated
Period 1 (3/16–5/24/20)	1397	70	56	14
Period 2 (5/25–8/2/20)	222	31	13	18
Period 3 (8/3–10/11/20)	63	11	0	11
Period 4 (10/12–12/20/20)	566	9	1	8

^a Each period is 10 weeks in length.

^b State Department of Public Health rolling 7-day mean hospitalization rate.

Table 1(b) also shows the number of town halls delivered during each of four 10-week periods, along with the rolling 7-day mean of hospitalizations in the region. As shown, the mean number of hospitalizations was highest during the initial 10-week period followed by a second surge of hospitalizations during the final, 10-week period. The table also shows the shift from general to dedicated town halls over time.

3.2. Stressors and resilience strategies by type of town hall

Table 2 shows the mean number of stressors and resilience strategies reported by participants and summarizes between- and within-group differences examined. Highly significant between-group differences were observed in the mean stressors reported between dedicated and general town halls; 8.53 mean stressors were reported in dedicated town halls as compared to 5.71 reported in general town halls ($t = -3.08$, $p < .003$). Although slightly higher mean resilience strategies were reported in dedicated vs. general town halls (6.78 vs. 6.37), this difference was not significant. However, the combined production of stressors and resilience strategies observed in dedicated vs. general town halls was significant ($t = -2.19$, $p < .02$), indicating that dedicated town halls resulted in significantly more sharing of experiences than general town halls. In terms of within-group differences, no significant differences were observed in the reporting of stressors and resilience strategies in general town halls (5.71 vs. 6.37), but a small, trend level difference was observed in dedicated town halls ($t = 1.67$, $p < .10$), with more stressors reported in dedicated vs. general town halls (8.53 stressors vs. 6.78 resilience strategies). Thus, dedicated town halls, in which participants worked together or knew one another, clearly resulted in more sharing of experiences, especially stressors.

3.3. Stressors and resilience strategies reported and their change over time

Table 3 summarizes six types of stressors (a) and eight types of resilience strategies (b) and their change over time. Table 4 details codes for stressors and resilience strategies.

3.3.1. Stressors

Table 3(a) shows the percentage of six types of stressors and their change over time: work stress (31%), family and parenting stress (26%), stress signs and symptoms without a specific cause (20%), societal stress due to the social and political context (14%), stress due to social isolation and loneliness (7%), and stress practicing self-care (3%).

Given that town halls were organized through the workplace, it is not surprising that the highest proportion of stressors reported were work related. Examples included: challenges in caring for sick patients and dealing with ever-changing work schedules and routines. This was observed not only for individuals working on the front lines (“Every service line went through tremendous change”) but also for those working remotely (“...staying up late and getting up early to meet deadlines at work.”). Although many healthcare workers reported feeling supported by colleagues, several described stress because of a colleague or supervisor. Some healthcare workers not providing patient care due to their age or health status reported experiencing this as a threat to their

Table 2
Means and standard deviations of stressors and resilience strategies reported in general vs. dedicated town halls.

Town Halls	General	Dedicated
Stressors	5.71 (3.49) ^a	8.53 (5.81) ^b
Resilience Strategies	6.37 (4.21) ^c	6.78 (4.70) ^d
Combined Stressors & Strategies	12.09 (6.57) ^e	15.31 (8.94) ^f

Note: Based on 1627 responses (835 stressors, 792 resilience strategies) in 121 town halls with 3555 participants.

$a < b$, $t = -3.08$, $p < .003$; $c > d$, ns; $e < f$, $t = -2.19$, $p < .02$; $a < c$, ns; $b > d$, $t = 1.67$, $p < .10$.

Table 3
Stressors and resilience strategies reported in the town halls during each of four periods.^a

(a) Stressors					
Stressors	Overall (3/ 20–12/ 15) (n = 894) %	Period 1 (3/20–5/ 24) (n = 407) %	Period 2 (5/25–8/ 9) (n = 222) %	Period 3 (8/ 10–10/4) (n = 190) %	Period 4 (10/ 5–12/15) (n = 75) %
Work Stress	31	28	23	46	41
Family/ Parenting Stress	26	29	20	27	24
Stress Signs & Symptoms	20	28	16	9	13
Societal Stress (social & political context)	14	8	30	8	8
Social Isolation Stress	7	5	7	10	5
Self-Care Stress	3	3	4	2	–

(b) Resilience strategies					
Resilience Strategies	Overall (3/ 20–12/ 15) (n = 845) %	Period 1 (3/ 20–5/ 24) (n = 438) %	Period 2 (5/ 25–8/9) (n = 184) %	Period 3 (8/ 10–10/ 4) (n = 152) %	Period 4 (10/ 5–12/ 15) (n = 71) %
Practicing Acceptance	21	24	17	17	21
Using Positive Reappraisal	17	20	17	10	9
Building Social Connections	17	16	21	20	15
Practicing Self-Care	16	19	11	12	21
Engaging in Valued Activities	10	10	17	3	5
Making Adjustments at Work	9	2	5	33	25
Making Family/ Parenting Adjustments	7	7	10	3	2
Limiting News Exposure	3	3	3	3	3

^a There were 835 coded stress responses and 792 resilience strategies reported in 121 town halls and with a total of 3555 participants.

professional identity. Many stressors (26%) reported involved family and parenting issues. One person captured the view of many others in saying she felt “...ineffective as both a parent and a professional because demands on both fronts are so high.” Many parents also reported stress due to a lack of childcare, challenges managing children’s schooling or coordinating changing school schedules, and balancing work and family demands.

One in five stressors (20%) involved stress signs and symptoms without a specific identified cause. Among the most common of these was feeling fear; anxiety (“...an impending feeling of doom...”); anger or irritability; guilt (“...just feeling guilty, not about anything specific...”); overwhelmed by emotions; food cravings; and tired or exhausted. About 14% of stressors reported involved societal stress due to the social and political context. As one person stated, “All news is ‘breaking news’ and I feel more scared after I watch.” Many participants reported feeling especially stressed following the murder of George Floyd in late May 2020. In addition, healthcare workers of Asian or Pacific Islander

backgrounds reported stress due to racist comments directed at them from patients. Some participants expressed frustration or disappointment about the government response to the pandemic or that pandemic safety measures had become politicized.

Seven percent of stressors reported were due to social isolation or loneliness. Some participants longed for regular social interactions and missed contact with family and friends. For some, the lack of physical touch was a significant loss. Finally, at 3% of stressors reported, were challenges practicing self-care. Most common was not being able to engage in self-care due to gym restrictions, feeling too tired, or changing work or family schedules.

Table 3(a) also shows these stressors over time. Notable are the increases in work stress reported – at 46 and 41% – during the last two periods, when dedicated town halls predominated and town halls mostly involved work colleagues. Also of note is an increase in societal stress of 375% above the mean relative to other periods following George Floyd’s murder on May 24, 2020. Two other notable observations were the higher reports of non-specific stress signs and symptoms during the first 10 weeks of the pandemic and the consistent family and parenting stressors across all 40 weeks.

3.3.2. Resilience strategies

Table 3(b) shows the percentage for eight types of resilience strategies reported and their change over time: practicing acceptance (21%), using positive reappraisal (17%), building social connections (17%), practicing self-care (16%), engaging in valued activities (10%), making adjustments at work (9%), making family/parenting adjustments (7%), and limiting news exposure (3%). The most common strategy, at 21%, was practicing acceptance. Many participants described needing to “practice acceptance of the situation” or “focus on what is possible right now.” Several stated that they have learned to “take things one day at a time” and had come to accept “...what cannot be changed...”. Several also described having to learn how to “be kind to yourself” and to “forgive yourself for not always being at your best.” The next most frequent resilience strategy employed, at 17%, was using positive reappraisal. For many, this meant focusing “on the positive in the situation” or on “lessons learned” from the pandemic. Some described learning to “celebrate small wins” or to reflect “on what you are grateful for.” Practicing acceptance and using positive reappraisal are both cognitive strategies, which Troy et al. [34] show are effective in building resilience.

Building social connections and practicing self-care, at 17% and 16%, respectively, were the next most frequent strategies reported. Building social connections included spending time with family, friends, colleagues, or co-workers, sometimes to receive or give support. One person described “leaning on and supporting one another as a team in the workplace” and several others described spending “time with family to decompress.” Several participants noted that the key to building social connections was being intentional about one’s relationships. In contrast, practicing self-care usually involved promoting one’s individual health and well-being, such as through exercise, healthy eating, sleep, practicing mindfulness or meditation, engaging in prayer or spirituality, or establishing a routine. Practicing self-care involved redirecting intentionality to personal health and wellbeing. Another common resilience strategy reported, at 10% of the time, was engaging in valued activities. These activities varied greatly among participants, from pursuits such as cooking, reading, or home improvement projects to participating in social action in response to social and political unrest. Several participants described the benefits of doing something “creative” or what brings you “joy.” In contrast to the cognitive strategies identified earlier, these three resilience strategies – building social connections, practicing self-care, and engaging in valued activities – all involved various types of behavioral activation [35].

At 9 and 7% of strategies reported, respectively, was making necessary adjustments at work or in the family or in parenting. In the workplace, this may involve being flexible about one’s work schedule, using “daily check-ins” with staff, or adopting a buddy system for

Table 4
Types of stressors and resilience strategies reported in the Town Halls.^a

(a) Stressors.		
Stressor Types	Specific Stressors	
Work Stress (31%)	<ul style="list-style-type: none"> - Dealing with changing work routines/structures - Managers accommodating changing staff needs and work schedules - Supporting staff when feeling stressed 	<ul style="list-style-type: none"> - Not being supported by supervisor or manager - Feeling helpless to assist in the pandemic - The pandemic as a threat to professional identity - Feeling mental health stigma in the workplace
Family/Parenting Stress (26%)	<ul style="list-style-type: none"> - Dealing with stress behaviors by staff or colleagues - Increased/changing parenting demands - Changing family routines/practices due to the pandemic - Balancing work and family demands - Sharing home and workspace - Assisting with children's schooling 	<ul style="list-style-type: none"> - Caring for sick and distressed patients - Caring for elderly relatives - Uncertainty about children's return to school - Increased family conflict - Concern about the pandemic's impact on child well-being - Fear of family members getting infected - Grief & loss of milestones
Stress Signs & Symptoms (20%)	<ul style="list-style-type: none"> - Anxiety and uncertainty about the pandemic & its aftermath - Anger, irritability - Difficulty sleeping - Fatigue, exhaustion 	<ul style="list-style-type: none"> - Grief & loss - Guilt - Overwhelmed with feelings, disoriented, difficulty concentrating - Sadness, depression - Anxiety about mental health or well-being
Societal Stress (social & political context) (14%)	<ul style="list-style-type: none"> - Governmental response to the pandemic - Stress due to racial unrest & concerns about systemic racism - Stress due to experiences of prejudice and microaggressions 	<ul style="list-style-type: none"> - Stress due to media exposure - Stress due to people not following pandemic protocols - Stress due to the toxic political climate
Social Isolation Stress (7%)	<ul style="list-style-type: none"> - Loneliness & isolation 	<ul style="list-style-type: none"> - Missing family, friends, and social connections
Self-Care Stress (3%)	<ul style="list-style-type: none"> - Challenges practicing self-care or related resilience strategies 	<ul style="list-style-type: none"> - Challenges managing self-care tasks
(b) Resilience strategies		
Resilience Strategy Types	Specific Strategies	
Practicing Acceptance (21%)	<ul style="list-style-type: none"> - Practice self-acceptance of situation - Practice self-acceptance, including emotions 	<ul style="list-style-type: none"> - Focus on what is possible right now - Find meaning & purpose in the pandemic and its aftermath
Using Positive Reappraisal (17%)	<ul style="list-style-type: none"> - Focus on the positive in the situation - Focus on lessons learned for the future 	<ul style="list-style-type: none"> - Practice gratitude
Building Social Connection (17%)	<ul style="list-style-type: none"> - Connect with family or friends - Connect with colleagues, co-workers, or supervisors - Get support from family or friends - Get support from colleagues, coworkers, or supervisors 	<ul style="list-style-type: none"> - Get support from professionals - Give support to family or friends - Give support to colleagues, co-workers, or peers
Practicing Self Care (16%)	<ul style="list-style-type: none"> - Practice self-care (exercise, eating, sleep, substance use) - Practice self-care (routines & structure, time away from work) - Practice self-care (mindfulness, meditation, breathing) 	<ul style="list-style-type: none"> - Practice self-care (prayer, worship, spirituality) - Practice self-care (pandemic protocols)
Engaging in Valued Activities (10%)	<ul style="list-style-type: none"> - Engage in hobbies, projects, and pursuits 	<ul style="list-style-type: none"> - Engage in social action (e.g., social & racial justice)
Making Adjustments at Work (9%)	<ul style="list-style-type: none"> - Adjust routines or schedules for staff or managers - Implement pandemic protocols or lessons learned - Implement/participate in programs to promote staff wellbeing 	<ul style="list-style-type: none"> - Strategies for managers to support staff - Receive support from supervisor - As a reprieve with its own rewards
Making Family/Parenting Adjustments (7%)	<ul style="list-style-type: none"> - Adjust parenting practices or schedules - Adjust family practices or schedules - Promote child's self-care/wellbeing 	<ul style="list-style-type: none"> - Promote connections for child(ren) - Promote connections with extended family - Promote connections with family friends
Limiting News/Media Exposure (3%)	<ul style="list-style-type: none"> - Limit exposure to news/media for self and family 	<ul style="list-style-type: none"> - Stay informed despite limited exposure

^a There were 835 coded stress responses and 792 resilience strategies reported in 121 town halls and with a total of 3555 participants.

support. At home, this might involve adjusting family routines and schedules, trading off homeschooling with a partner, or engaging elderly loved ones. A final resilience strategy reported at 3% of the time was limiting news consumption. Several participants spoke of how limiting media exposure to news, especially before bed, made them feel less anxious, angry, or discouraged about the pandemic. These three strategies could be either cognitive or behavioral in their application, depending on the context.

Table 3(b) also shows changes in the use of specific resilience strategies over time. In contrast to the shifts observed in reports of stressors experienced, resilience strategies used were more stable over time, with only a few exceptions. Using positive reappraisal began to wane in the last 10 weeks of the study period as more individuals reported “pandemic fatigue”, and engaging in valued activities also dropped during periods 3 and 4. A change observed over time was the dramatic increase in work adjustments made during those same two final periods, at 33 and 25%, respectively. This change coincided with the shift to dedicated town halls with co-workers and colleagues.

4. Discussion

We summarize results from a health system intervention to support healthcare workers experiencing stress, burnout, and disruptions in well-being during the COVID-19 pandemic. Results are reported from 121 virtual and interactive Stress and Resilience Town Halls delivered to 3555 healthcare workers in a large, tri-state, academically-affiliated health system during the first 40 weeks of the pandemic. Results show that dedicated town halls (open to specific health workforce groups) had about 84% higher mean attendance and significantly more sharing of stressors and resilience strategies combined than general town halls (open to anyone in the health system). This was likely because dedicated town halls were tailored to meet the needs of specific groups, scheduled at convenient times, and involved participants that worked together. The shift from general to dedicated town halls early in the pandemic illustrates how these virtual and interaction town halls can be responsive to emerging health system needs during times of crisis to support the health workforce.

Six stressor types were reported by healthcare workers and other staff, with work stress and family/parenting stress reported most

frequently at 31 and 26%, respectively. These stressors were reported at similar overall rates in general and dedicated town halls across the 40-week study period, but work stressors predominated during the last half of implementation when more dedicated town halls were scheduled. Another change in stressors reported over time, in both general and dedicated town halls, was the sharp increase in social and political stress reported immediately after the murder of George Floyd. Most of this increase was due to participants' experiences of or distress about racism that intersected with pandemic stress during this period, an observation consistent with reports from other scholars [14,36,37].

Eight types of resilience strategies were observed in the town halls. Two cognitive resilience strategies, practicing acceptance and using positive reappraisal, accounted for 38% of strategies reported. There is strong evidence that the use of these strategies has long-term health benefits [34,38]. In contrast, three behavioral activation strategies were frequently observed – building social connections, practicing self-care, and engaging in valued activities – accounting for 44% of all strategies reported. Behavioral activation strategies have also been found to be effective in reducing depression and promoting wellbeing [35,39]. The remaining 19% of resilience strategies used – making adjustments at work, making adjustments in the family or in parenting, or limiting news exposure – involved either cognitive or behavioral activation approaches depending on the context. For example, a person may remind themselves that the news about the pandemic will still be available to them when they are more ready to engage with it (a cognitive strategy) or a supervisor may approach a staff member who is upset after a difficult encounter with a patient (a behavioral activation strategy).

Our study informs and extends recent research on stress and resilience among healthcare workers during the COVID-19 pandemic. Several studies have shown the value of peer support [40] and informal supports provided to healthcare workers [41] during the pandemic. In addition, the present study extends recent research by specifying the variety of unique stressors experienced by healthcare workers living with and caring for children or elders during the pandemic [22], and how unplanned job demands for healthcare workers increase health workforce stress [9].

The present study also supports recent developments in healthcare to support the health workforce in preparation for the next crisis, disaster, or pandemic [31,41]. Central to these developments is ensuring that there are ongoing tiered supports and resources for wellness promotion in hospitals, healthcare organizations, and health systems [41–43] so that individuals can choose among a range of strategies that fit their individual circumstances [28,43,44]. Our study shows that healthcare workers employ various strategies, formal and informal, to support their resilience and well-being, and that these vary over time in response to new demands and stressors.

Although the COVID-19 pandemic is a prolonged traumatic stressor, many healthcare workers report resilience despite experiencing adversity; that is, they report normative and even enhanced functioning or wellbeing in the aftermath of trauma [45,46]. We found that the virtual and interactive Stress and Resilience Town Hall represents a trauma-informed systems approach [50] for mutual sharing of stressors and resilience strategies to build support, wellness, and resilience among healthcare workers consistent with guidance provided by the APA Committee on the Psychiatric Dimensions of Disaster that urges healthcare systems to “create a culture of wellness and mutual support throughout an organization” and to “promote and educate about individual self-care and resilience approaches.” [31]

One key feature of the Stress and Resilience Town Hall is that it is virtual. Virtual town halls are readily accessible, scalable, and sustainable, and thus represent a rapid health system response for delivering targeted interventions to healthcare workers to reduce stress and burnout and to promote wellbeing. Another key feature of the Stress and Resilience Town Hall is that it is interactive. Even though each town hall is facilitated by a psychiatrist or psychologist, it is fundamentally participatory. Although town hall facilitators are experts, they

encourage individuals to share their personal narratives of stress, resilience, and healing, which creates a supportive dynamic that is mutual and collaborative. By affirming evidence-based strategies reported, facilitators also reinforce their use. Words of appreciation by participants to one another are common in these town halls, fostering a culture of support and wellness among the group, which for dedicated town hall participants, also supports the section, unit, or team.

5. Limitations

The present study has a number of limitations. One limitation is that the mental health and well-being of town hall participants was not directly assessed before or after participation in the town halls. As noted earlier, this was not done because the purpose of these virtual and interactive town halls was to stand-up a rapid, system-wide response to support the health workforce with minimal barriers to participation. Thus, we ensured anonymity of participation by not requiring registration for town halls and not video recording them. We also did not take direct quantitative assessments that could be experienced as a burden by healthcare workers experiencing acute stress, but did anonymously annotate response for subsequent qualitative coding of experiences shared. Once participants attended a town hall they were provided with links to a wide range of resources and supports as well as access to an anonymous quantitative survey in which they could track their experience of stress signs and symptoms over time. These links also gave those interested the option of obtaining up to 4 sessions of 1:1 consultation and counseling at no cost. Future research should consider having participants link to a similar survey that indicates their participation in a Stress and Resilience Town Hall as well as other supports to assess the relationship of participation to stress symptoms, burnout, and well-being.

Another study limitation is that we were not always able to obtain a deeper and more nuanced understanding of the various stressors or resilience strategies shared in the town halls. For example, differences in stress intensity and impact between unrelenting work demands and moral injury due to those demands could not readily be discerned in a town hall. In another example, it was not always apparent whether one's self-acceptance of an emotion represented “practicing acceptance” or another resilience strategy, such as positive reappraisal or practicing self-care. By anchoring each response provided in a town hall to the entire context of what an individual shared we were able to assign codes to responses reliably, thus resulting in excellent inter-rater reliability. Future research should consider conducting follow up interviews or focus groups with select town halls participants to deepen understanding of specific stressors and resilience strategies shared.

6. Conclusions

During this worst pandemic in more than a century, the virtual and interactive Stress and Resilience Town Hall represents an opportunity to support healthcare workers, hospitals, and health systems to build resilience. These town halls are adaptable to emerging stressors during periods of crisis or disaster in which targeted or health system supports for the health workforce are essential to mitigating traumatic stress [43,47,48]. Because they blend a brief topical presentation by a facilitator with mutual sharing of stressors and resilience strategies by participants, they are also responsive to emerging stressors experienced by healthcare workers outside of the workplace as these emerge over time. In this study, this was evident when participants shared concerns about the changing guidance on children's schooling, experienced racist comments from patients or race-related stress after the murder of George Floyd, or described personal crises due to changing family demands. The flexibility afforded by the Stress and Resilience Town Hall makes it a valuable and promising evidence-based approach for building resilience in the health workforce as well as in hospital and health systems during local or national crises. When implemented as part of a tiered, health

system response to support healthcare workers that incorporates other evidence-based interventions [28,42,49], it holds promise for reducing health workforce stress and burnout and promoting workforce well-being during future crises, disasters, or pandemics.

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Ethical principles

All procedures involved in this work complied with ethical and professional standards.

Prior presentation

None.

Author contributions

Jacob Tebes: study conceptualization, design, & leadership. All Authors: contributions to intervention content and implementation. Jacob Tebes and Michael Awad: study data collection & analyses, and initial manuscript draft. All Authors: review and revisions to the manuscript, and approval of final version.

Data statement

Although the lived experiences shared by participants in the Stress and Resilience Town Halls were anonymized through annotations made by trained observers, the sensitive nature of some of these qualitative responses require confidentiality, and thus the data is not publicly available. Data not available/The data used is confidential.

Declarations of interest

None.

Data availability

The data that has been used is confidential.

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