

Front Line Resilience: Evaluation of a virtual curriculum with medical providers and firefighters during COVID-19

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Background: The Front Line Resilience (FLR) program was developed to provide mental resiliency tools to firefighters, health care professionals, and medical students serving Asheville, NC during the COVID-19 pandemic. Participants attended 15–30-minute weekly Zoom sessions to learn mindfulness topics. Interested participants were paired with a practice partner. The purpose of this study was to evaluate participants' perceptions of the effectiveness of the virtual FLR curriculum on their mindfulness practices and resiliency.

Methods: FLR participants were invited to evaluate program effectiveness via online feedback surveys. Survey respondents were then invited to participate in an interview for more in-depth evaluation. Surveys were analyzed using descriptive statistics. Interviews were transcribed and independently assessed by two researchers via manifest content analysis.

Results: Of all 46 participants who attended at least one FLR session, ten respondents completed the survey. Of those respondents, five (50%) participated in interviews. Respondents indicated that FLR had a moderate (70%) or significant (30%) effect on their mindfulness practice, and a moderate (60%) or significant (30%) effect on resilience. Thematic analysis of interviews revealed participants learned specific techniques to expand their resilience toolbox and valued connection and accountability with other frontline professionals; however, their experiences did not always meet expectations.

Limitations: This study had a low survey response rate of 21.7% which may have led to non-response bias.

Conclusions: FLR positively impacted self-reported mindfulness practices and resiliency of frontline workers during the COVID-19 pandemic. This model could be used to support mindfulness practices for other professions.

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Introduction

Medical students, health care providers, and firefighters share high levels of stress and burnout approaching 50%.^{1,2} Physician burnout is associated with increased medical errors, malpractice risk, job turnover, divorce, substance use, and suicide rates.³ Burnout decreases quality of care and patient satisfaction. Medical students and residents report high levels of burnout, depression, and extreme fatigue.⁴ Similarly, firefighters report high levels of physical and emotional burnout.⁵ In this critical time of

ever-changing health care and global pandemic, medical and frontline training centers should help providers maintain resilience (the ability to adapt to challenging circumstances) and job satisfaction, translating into improved patient care.

Mindfulness has the potential to prevent compassion fatigue and burnout. Studies demonstrate that health care students who follow integrated mindfulness curricula report decreased stress, anxiety, and depression and improved mindfulness, self-efficacy, and empathy.⁶ Studies have also established the feasibility and effectiveness of incorporating mindfulness interventions among physicians, however the impact of these interventions among resident physicians and medical

students needs further exploration.⁷⁻⁹ Still, mindfulness interventions can lead to enhanced well-being and performance; mindfulness interventions with firefighters have shown decreased depression, anxiety and enhanced wellbeing.^{10,11}

The COVID-19 pandemic rapidly decreased social connections and increased uncertainty and stress. Health care providers and firefighters faced limited PPE, and quickly changing staffing, patient acuity, and frequently changing protocols on everything from masks to isolation. Medical students were pulled from rotations, fueling guilt for not contributing, then returned with shifting schedules and limited PPE. Uncertainty and fear added significantly to the stress on all involved; a dire need for mindfulness training and practice became apparent. Front Line Resilience (FLR) was developed as a virtual pilot program to safely address this acute need, offering resilience and stress reduction tools to health care providers and frontline responders. Front Line Resilience (FLR) was designed to provide professionals from the Asheville Fire Department (AFD), University of North Carolina School of Medicine (UNC SOM) – Asheville Campus, and Mountain Area Health Education Center (MAHEC) with pragmatic mental resilience and mindfulness tools during the pandemic.

The purpose of this study was to evaluate participants' perceptions of the effectiveness of the FLR curriculum on their mindfulness practices and resiliency.

Methods

Participants and Program Implementation

A convenience sample of MAHEC OB residents and faculty clinicians (including midwives and nurse practitioners), faculty preceptors, third- and fourth-year Asheville medical students, and Asheville city firefighters were sent electronic

invitations to participate in FLR. The program was created and facilitated by three mindfulness trained professionals: a licensed clinical mental health counselor, a physician, and an AFD Engineer. The program took place from April to June 2020. Six 15-minute virtual Zoom sessions were conducted during the first program offering. Given the ever-evolving professional demands and work scheduling changes during the early in the pandemic, participants could attend as many of the sessions as they were able. After an introductory overview, core topics included attentional and nervous system stability, cognitive flexibility, situational awareness of self, others, and the environment, thriving, and insight/reflection. Each session included a brief guided meditation practice, the science behind the core topic, and a discussion as a large group or in breakout rooms.

Study Design

At the end of the sixth session, participants were queried regarding interest in continuing the scheduled virtual sessions and asked to rank additional core topics for future calls. Ninety five percent of participants requested to continue weekly calls, and topics were prioritized. A second series was scheduled, and these virtual sessions were extended to 30 minutes. Core topics in this series included: finding inspiration, cultivating joy, building compassion, resilient relationships, changing behavior, humor, and FLR going forward. Attendance varied between 12-40 participants.

As a part of FLR, participants were invited to establish a mindfulness practice partner. Practice partners served in a peer support capacity that enhanced their own resilience and that of another front line professional. Participants could request a practice partner through the FLR website, the virtual session, or by emailing or calling any of the facilitators. Facilitators paired participants based on their level of experience in their work. Participants were given partners' contact information and

individually collaborated on the best format for communication.

In August 2020, participants were emailed an online anonymous questionnaire using Qualtrics (Provo, UT). Electronic surveys were sent to anyone who attended at least one FLR Zoom session or participated in the practice partner pairings (Appendix A). Upon survey completion, respondents were invited to participate in a follow-up interview. Informed consent was obtained from program participants agreeing to individual interviews.

Data Analysis

For the quantitative portions of this analysis, descriptive statistics were used to calculate frequencies and percentages. Respondents opting to participate in an interview submitted their contact information and were scheduled for a virtual interview conducted by the primary author. Interviews were recorded, transcribed, and subsequently de-identified by a member of the research team. Respondents answered nine open-ended questions designed to better understand their experiences participating in the FLR program (Appendix B). Qualitative interviews were transcribed and independently reviewed by two of the authors and manifest content analysis conducted.¹² Responses were coded and categories created. Two authors (AA and DPB) met repeatedly after each iteration of the process to organize, reduce categories, and determine thematic saturation. The institutional review board at the University of North Carolina at Chapel Hill considered this study exempt (IRB 20-2066).

Results

Ten respondents completed the FLR evaluation (response rate of 21.7%). Of those ten respondents, five participated in interviews (50%), including three medical students, one firefighter, and one

nurse-midwife. The majority of participants (70%) endorsed an established mindfulness and/or well-being practice prior to program participation. While three co-authors and one instructor participated in this intervention and were assigned a practice partner, they did not submit an evaluation and were excluded from analysis.

Frequently Employed Mindfulness & Resilience Tools and Impact on Mindfulness Practice

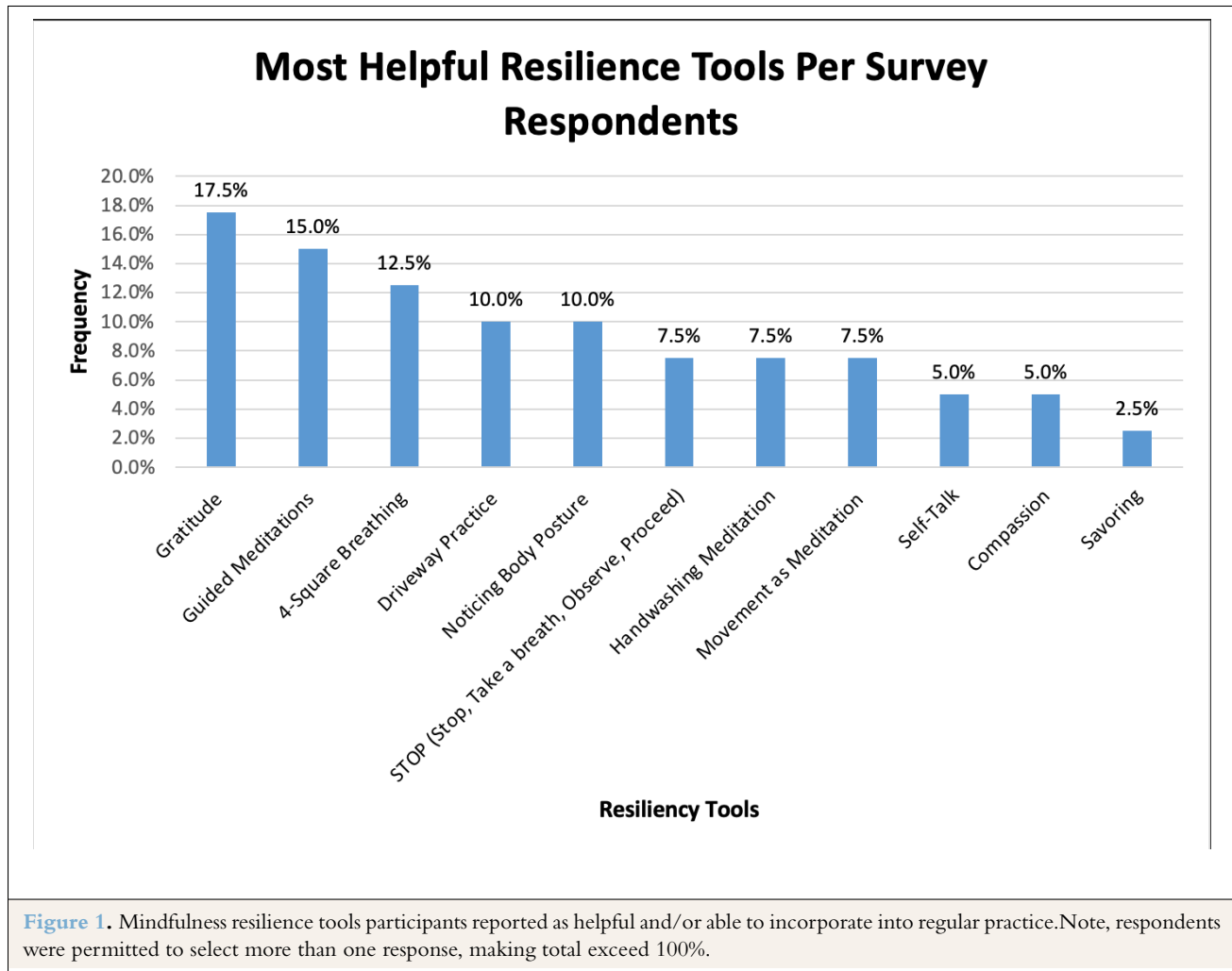
Quantitative

Of the resilience tools practiced during the sessions, Figure 1 shows the techniques participants found helpful. All ten respondents (100%) reported at least weekly incorporation of resiliency practices into everyday life with 40% of participants indicating that they utilized techniques more than once a day. Three respondents (30%) endorsed daily resiliency tool practice.

Thirty percent (30%) of survey respondents indicated that FLR had a significant impact on their mindfulness practice, while 70% reported a moderate impact. Participants indicated introduction to and consistent application of resiliency tools fostered by FLR were contributory factors toward program impact. Similarly, 30% of respondents reported that the program had a significant impact on their resilience during the pandemic, with 60% of respondents endorsing moderate impact. Positive impacts were attributed to group interactions and kinship during periods of isolation; consistent, designated weekly meeting times; continued fostering of resiliency and mindfulness tools; and reinforcement of practice. Every survey respondent (100%) indicated that they would participate in this program or a similar program in the future and would recommend the program to a colleague.

Qualitative

In the interviews, two of the five participants hoped the FLR program would help them learn



specific mindfulness techniques to expand their resilience toolbox. Two interviewees endorsed guided meditation as the most meaningful aspect of the virtual sessions. Additionally, the other three interviewees shared specific mindfulness techniques that resonated with them: Four Square Breathing, Noticing, the Driveway Practice, and guided meditations. Examples of these techniques and their impact include:

“One of the [facilitators] was talking about how...before he drives the fire truck, he does the Four-Square Breath and puts his feet on the ground... I have been honestly trying to do that before I go into every patient room, especially if I know it’s gonna be stressful. And I can already kinda notice that that alone is helping as kind of a single – thing that I pulled from it.” [Interviewee 3]

“...having some guided meditations was also really meaningful... I think we did a Noticing one [that I found helpful]... I was sitting on the porch and it was like, ‘Open your eyes and see what’s right in front of you.’ And I was looking at trees, and I was listening to wind chimes. And it just ended up being a really good moment to be in nature on my front porch, but really appreciate those little things.” [Interviewee 4]

Helpful Components of Weekly Virtual Sessions

Quantitative

When considering which components participants deemed most helpful toward development of their

mindfulness practice, respondents reported that brief mindfulness and resiliency tools (29.6%), guided meditations (25.9%), and weekly accountability (22.2%) were most beneficial. Of note, in several survey questions, participants were able to select more than one response (see Appendix A).

Qualitative

Four of five interview participants were drawn to the program because it involved engaging with other individuals within or outside of their fields. Two interviewees specifically mentioned interest in the multidisciplinary aspect of the program. Participants found that learning from one another's mindfulness experiences became one of the most meaningful aspects of the program.

“[The most meaningful aspect of the Friday sessions was] just hearing about how people are incorporating the practices in their lives and kinda what’s going on with them, like what’s been working or what hasn’t been working or how they’ve adapted things to make it fit their lives. I think I like that part the best.” [Interviewee 1]

Practice Partner Participation & Accountability

There were 23 practice pairs (46 participants). One duo opted out due to time constraints. Practice partners' communications included brief calls, sharing inspiring photos or quotes, or texting “.b” which means “stop” and “be,” as a reminder to take a mindfulness pause.

Quantitative

When it came to the practice partnerships, the majority (70%) communicated with their practice partner less than once a week. Over 90% of those queried utilized the .b text message resiliency tool as their most frequent communication mode. Figure 2 depicts the limitations to practice partner communication as reported by survey respondents. Lack of partner responsiveness was the largest limitation to communication at 30.8%.

Forty percent (40%) of respondents agreed that having a practice partner offered accountability to consistent mindfulness practice while half of those surveyed (50%) disagreed that having a partner enforced accountability. When queried whether having a practice partner contributed to their resiliency, 40% reported neutrality—that they neither agreed nor disagreed with the statement, and 30% agreed and 30% disagreed.

Qualitative

The interviews echoed the survey findings. Participants commented on how they liked the idea of having a practice partner to ensure accountability toward their mindfulness practice, but some of their experiences did not live up to these expectations. Specifically, three participants did not feel that their practice partners contributed to their resilience, citing reasons such as their partner was not very communicative, they did not make a connection with their partner, or their partner was busy.

“I think that the idea was meaningful that we could keep each other accountable. I would have loved to have been like, ‘Hey, when are you meditating today?’ I would have loved someone to, ...[say] ‘Hey, I just did my five minutes or 20 minutes. Did you do yours?’ So, I liked that idea, but it really didn’t happen for us.” [Interviewee 5]

“I think it was just a pairing of two people who probably needed one person to really be on it, and neither of us were.” [Interviewee 4]

However, two out of the five interviewees shared anecdotes of how their relationship with their practice partner was meaningful to them.

“...My interactions with my practice partner were really cool because he was a lot more experienced than I was in some of this... but he was really supportive, and he was just like, ‘You know, you’re – it took me a long time to get this. You’re a student, and it’s a lot of transitions. You should practice more self-forgiveness,’ and I was like, ‘Yeah, you’re right.’...I think that helped, just kind of having that mindset of, ‘It’s not gonna be perfect, but I’m gonna do something.’” [Interviewee 1]



The same interviewees who found that their relationships with their practice partners were meaningful also specified how they believed .b text messages from their practice partners improved their resiliency.

“It really was nice to get .b’s in the day because I have a really strong kinda morning and night practice, but I can be a very just – meditate in the morning and then sorta blast off and total forget about everything; and then it was cool to get .b’s and like ‘Oh yeah,’ kind of bring me back into, ‘Okay, let’s see if I can actually do this while I’m out in the world not sitting cross-legged on my couch or whatever.’...Frontline Resilience... showed me that I could do so much more during the day with those .b’s and stuff.” [Interviewee 2]

Barriers to Participation

Quantitative

While two respondents (20%) reported consistent attendance in the weekly FLR virtual sessions, eight participants (80%) cited scheduling conflicts as a reason for missed sessions. No respondents indicated their absence was due to disinterest or ineffectiveness in the program.

Qualitative

When it came to the interviews, four interviewees felt that scheduling conflicts were a barrier to the Friday sessions.

“Having it was lunchtime was helpful, but still finding the time was sometimes hard. And I didn’t go to all of them because... – it just became – hard for me to find the time. And it was like I could either find the time to be – mindful to myself and healthy myself or I could be

on the Zoom call. But – I guess it doesn't have to be exclusive... That was my challenge.” [Interviewee 3]

Discussion

The FLR program was created early in the COVID-19 pandemic to offer frontline workers resiliency tools and social connection as a resource during this unprecedented time. The program was a helpful resource for frontline workers during the pandemic as all survey respondents reported a moderate to significant impact to their mindfulness practice, and 90% of respondents indicated a moderate to significant impact on their resilience. Participants found the virtual sessions helpful because of the resiliency tools shared, the guided meditations, and the weekly accountability.

While this study did not directly measure the effects of resiliency and mindfulness on burnout, survey respondents and interviewees overwhelmingly reported a positive impact to their mindfulness practice and resiliency, which may potentially improve burnout. Other studies that have directly measured the impact of a mindfulness intervention among health care professionals during the COVID-19 pandemic support significant reductions in burnout and stress and improvements in resiliency.^{13,14}

While virtual platforms such as Zoom and Webex are now commonplace, virtual meetings of frontline workers was not common at the onset of FLR. The local connection between participants was one of the program's greatest strengths as participants were able to build a sense of community even in a virtual context. Participants felt that the weekly meetings and group interactions helped to positively impact their resiliency during the pandemic. Weekly meetings provided participants an opportunity to hear from other frontline workers and learn how they incorporated mindfulness practices into their lives.

With respect to practice partners, participants liked the idea of having a practice partner help with accountability. Unfortunately, most partner pairs communicated less than once a week, and data did not show one clear reason why practice partners were not successful. In the future, it may be helpful to host a session for participants to create a plan for their partnership and to provide participants additional ideas on how to utilize their partnerships. It may also be helpful to provide participants with opportunities to share successful strategies that they use for accountability with their practice pairs.

Several studies have explored interventions that may improve the psychological wellbeing of frontline workers during the pandemic.¹⁵⁻¹⁷ Viswanathan et al. described a videoconferencing peer support group model led by psychiatrists to address the stress frontline clinicians faced during the COVID-19 pandemic.¹⁵ While the sessions focused on group processes such as peer support and ventilation of emotions, group facilitators also taught mindfulness strategies and ended each session with a 3-minute guided meditation. Another study examined the effect of a 3-hour, in-person resiliency intervention with frontline health care workers during the pandemic and found that participants had improved well-being scores after one year of the intervention.¹⁶ Albott et al. describes a peer support model called Battle Buddies as part of a COVID-19 Psychological Resilience Intervention for health care workers.¹⁷ While Battle Buddies has similarities to FLR's practice partners, Battle Buddies is part of a larger organizational model with departmental involvement and incorporates individual counseling as needed. To the authors' knowledge, FLR is unique in connecting individuals across disciplines and levels of training to include medical students, health care professionals, and firefighters.

Limitations

A limitation of this study was the small and variable number of participants able to attend these weekly

sessions. As this intervention was implemented in the earliest weeks of the pandemic, these frontline workers often worked long hours during extended shifts and were unable to attend every session. Additionally, this timely pilot intervention was developed and deployed expeditiously to meet the acute mental health needs of frontline workers, but in more ideal circumstances could have been designed with a control group receiving another mindfulness intervention to compare effectiveness of FLR. Another limitation is the low survey response rate of 20%, possibly due to the weeks-long delay in sending out surveys to participants after program completion while the research team awaited IRB exemption. Additionally, completing the survey was a prerequisite to participating in an interview, which may have limited the number of interviewees as well. Because of the low response rate, there may be potential for non-response bias in the data collected. Lastly, the survey and interviews did not examine any long-term impacts of the FLR program beyond as the questions were developed to assess the effects of the program during an acute pandemic setting.

Conclusion

The virtual FLR program allowed participants to learn and incorporate specific mindfulness and resilience tools and practices across professions during the COVID-19 pandemic. The FLR program can be implemented in other local communities to provide resiliency tools and support to a greater number of frontline workers. Moreover, the FLR program format has the potential to expand beyond health care providers, firefighters, and medical students to include individuals in other professions as well. Mindfulness and resiliency programs could be expanded to include other frontline professions including social workers, teachers, nurses, and first responders.

Appendix A: FLR Survey

Thank you for participating in our Friday Front Line Resilience Zoom calls! Thank you for offering some anonymous feedback for future program planning. A reminder of the topics we covered:

Segment 1

- Week 1 (4/3) Intro
- Week 2 (4/10) Stability
- Week 3 (4/17) Flexibility
- Week 4(4/24) Situational Awareness
- Week 5(5/1) Thriving
- Week 6 (5/15) Reflection

Segment 2

- Week 1 (5/22) Finding Inspiration
- Week 2 (5/29) Cultivating Joy
- Week 3 (6/5) Building Compassion
- Week 4 (6/12) Resilient Relationships
- Week 5 (6/19) Changing Behavior for Good
- Week 6 (6/26) Healing Humor & FLR Going Forward

1. If you missed some of the FLR Zoom calls, was there a specific reason why?

- Time did not work with my schedule
- I did not find the sessions helpful
- I continued attending the FLR zoom calls (N/A)
- Other (specify):

2. Were there any mindfulness resilience tools that we practiced/discussed during the Friday zoom calls that you found particularly helpful and/or continued to practice on your own?

- 4 square breathing
- Coherent breathing
- Driveway practice
- Savoring
- STOP (stop, take a breath, observe, proceed)

- Meditation
- Movement as meditation
- Noticing body posture
- Self talk (“I’ve got this” or “It’s like this now”)
- Guided meditations
- Gratitude
- Compassion
- Other (specify):

3. After participating in FLR, how often did you incorporate brief resilience practices into your life?

- More than once a day
- Once a day
- Once per week
- Once per month
- Never

4. The most helpful part of the calls was (check all that apply)

- Weekly accountability
- Brief mindfulness tools for resilience
- Data about resilience and mindfulness
- Guided meditation
- Breakout sessions
- Group discussion

5. On average, how often did you communicate with your practice partner?

- No communication
- Less than once a week
- Once a week
- 2-3x/week

6. Outside of the Friday Zoom calls, how did you communicate with your practice partner (select all that apply).

- Text messages
- Phone calls
- Video chats
- In-person

7. How likely are you to continue communicating with your practice partner now that the Friday Zoom call sessions have ended?

- Very likely
- Somewhat likely
- Somewhat unlikely
- Very unlikely

8. What were limitations to communicating with your practice partner? Select all that apply

- I did not have time
- My practice partner was not responsive
- I did not find interactions with my practice partner beneficial
- My practice partner and I did not experience problems with communication
- Other (specify):

9. Having a practice partner helped me stay accountable to my mindfulness practice

- Strongly agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Strongly disagree

If strongly agree/somewhat agree to the above question, how so?

10. Having a practice partner added to my resilience

- Strongly agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Strongly disagree

If strongly agree/somewhat agree to the above question, how so?

11. Prior to the Frontline Resilience program, I had an established mindfulness practice

- True

- False

12. Prior to FLR program I had an established well-being practice

- True
- False

13. How much of an impact did FLR have on your mindfulness practice?

- Significant impact
- Moderate impact
- No impact
- I do not have a mindfulness practice

If significant impact/moderate impact to the above question, how so?

14. How much of an impact did FLR have on your resilience during these challenging times?

- Significant impact
- Moderate impact
- No impact

If significant impact/moderate impact to the above question, how so?

15. Would you participate in this program or a program like this again?

- Yes
- No

16. Would you recommend FLR to a fellow firefighter or healthcare professional?

- Yes
- No

17. What was the most meaningful aspect of the Frontline Resilience program?

18. What would have made the FLR more helpful for you?

Thank you so much for your participation in the program and feedback.

Appendix B: Interview Questions

1. What does resilience mean to you...?
2. In your personal life?
3. In your professional life?
4. What drew you to participate in the Front Line Resilience (FLR Program)?
5. What were your motivations for participating in FLR?
6. What did you hope to get out of the program?
7. How did the FLR program contribute to your resilience?
8. What was the most meaningful aspect of the Friday Zoom Call sessions?
9. What were the challenges or barriers to the Friday Zoom Call sessions?
10. How did practice partners contribute to your resilience?
11. What was the most meaningful aspect having a Practice Partner?
12. What were the challenges or barrier to having a Practice Partner?
13. Where do you envision the FLR program going from here?
14. How can this program be improved in the future?
15. Can you imagine how this type of program could be applied to other collaborations or professions?

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