

# Impact of a Resiliency Training to Support the Mental Well-being of Front-line Workers

## Brief Report of a Quasi-experimental Study of the Community Resiliency Model

Linda Grabbe, PhD, FNP-BC, PMHNP-BC,\* Melinda K. Higgins, PhD,\*  
Marianne Baird, MN, RN, ACNS-BC,† and Katherine M. Pfeiffer, MS, PMHNP-BC, PMHCNS-BC\*

**Background:** Front-line workers (FLW) are at risk for secondary traumatic stress, burnout, and related psychiatric sequelae: depression, anxiety, suicidality, posttraumatic stress disorder, and sleep and substance use disorders. FLW are in need of self-care programs to support their mental health.

**Methods:** Quasi-experimental study to assess the impact of a simple mental well-being and emotional regulation training, the Community Resiliency Model (CRM), using a convenience sample of FLW. Baseline scores of mental well-being and stress measures were compared with follow-up scores at 3 time points. Outcomes were psychological wellness (World Health Organization-5 Well-being Index); resiliency (Connor-Davidson Resilience Scale-10); traumatic stress (Secondary Traumatic Stress Scale); physical symptoms (Somatic Symptom Scale-8).

**Results:** Of the 104 participants who enrolled and attended the CRM training, 73 (70.2%) completed at least 1 posttest. Well-being scores increased at 1 year with a small-moderate effect size (Cohen  $d=0.32$ ). Resilience scores increased with a small-moderate effect size by 1 year (Cohen  $d=0.36$ ). Secondary traumatic stress scores declined, with the largest effect at 1 week (Cohen  $d=0.49$ ). Somatic symptoms decreased at each posttest, with the largest change occurring from baseline to 1 week ( $d=0.39$ ). Participants reported an awareness of body sensations helped them when overwhelmed as a means of calming themselves.

**Conclusions:** After a 3-hour CRM training, participants reported improved mental well-being and decreased secondary traumatic stress and somatic symptoms. This simple body awareness intervention may be a good resource during the COVID-19 pandemic.

**Key Words:** mental health, health care provider, resilience, secondary traumatic stress, well-being, burnout, alternative medicine

(*Med Care* 2021;00: 000–000)

Nurses, physicians, police, fire fighters, social service workers, mental health providers, and pharmacists are front-line health care workers (FLW) who regularly interface with distressed persons, and are at risk for secondary traumatic stress, burnout, and related psychiatric sequelae: depression, anxiety, suicidality, posttraumatic stress disorder (PTSD), and sleep and substance use disorders.<sup>1–5</sup> When FLW suffer psychologically, they may become emotionally depleted, disengaged, have difficulty making decisions, retire early, or engage in self-harm.<sup>6,7</sup> These problems have been documented in law enforcement,<sup>2</sup> nursing and medical students,<sup>3,4</sup> pharmacists,<sup>5</sup> first responders,<sup>8–10</sup> and health care providers.<sup>7,11</sup> Resiliency, that is, thriving and growing despite stressors, is a known protective factor against stress, but many resiliency interventions require multiple sessions and have a cognitive focus.<sup>12,13</sup> Because autonomic reactions to stress and trauma cause somatic responses,<sup>14</sup> an argument may be made for a preventative, body-based wellness intervention.<sup>15–18</sup> Body-based resiliency approaches take advantage of interoception (awareness of sensations in the body).

The Community Resiliency Model (CRM) is a non-cognitive variant of mindfulness, emphasizing attunement to interoceptive and exteroceptive signaling cues for regulation of autonomic responses to stress.<sup>17</sup> CRM was derived from somatic psychotherapy and developed by Miller-Karas and colleagues after survivors of natural disasters received brief, somatically based, self-stabilization interventions using their own body sensations to improve mood; lower rates of PTSD occurred subsequently.<sup>15,17,19,20</sup> In the 2008 Sichuan Earthquake, 350 FLW learned CRM and the majority later used these skills for their own emotion regulation and with the disaster survivors.<sup>15</sup> Marginalized groups with cumulative traumas have also demonstrated significant improvement in mental wellness with daily use of CRM.<sup>21</sup> Finally, in CRM's only randomized controlled trial of hospital nurses, the CRM group demonstrated significantly reduced secondary traumatic stress and physical complaints and improved well-being and

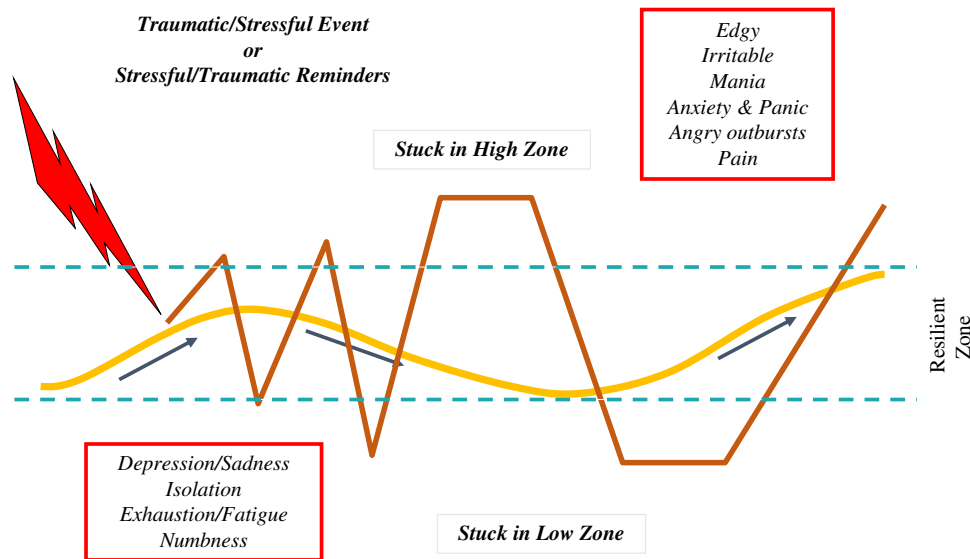
From the \*Nell Hodgson Woodruff School of Nursing, Emory University; and †Emory Healthcare, Atlanta, GA.

The authors declare no conflict of interest.

Correspondence to: Linda Grabbe, PhD, FNP-BC, PMHNP-BC, Nell Hodgson Woodruff School of Nursing, Emory University, 1520 Clifton Road, Atlanta, GA 30322. E-mail: lgrabbe@emory.edu.

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ISSN: 0025-7079/21/000-000



**FIGURE 1.** Responses to stress and trauma. Stressful and traumatic events and triggers. Depiction of stressful and traumatic triggers and events influencing one's resiliency zone. Individuals may become stuck in a "high zone" or "low zone," and exhibit behaviors indicative of one zone or the other. Graphic adapted by Elaine Miller-Karas from an original graphic by Levine/Heller. Reprinted with permission from the Trauma Resource Institute.

resiliency after a single 3-hour CRM session; participants used CRM's simple interoception techniques (eg, noticing the sensation of touching their scrubs) during tense or chaotic clinical situations, codes, and with dying patients.<sup>22</sup>

We examined the impact of a 1-time CRM intervention on a heterogeneous convenience sample of FLW including nurses, physicians, student nurses, hospital pharmacists, chaplains, and community mental health/social service providers in a large Southeastern US city. This study was conducted as an add-on to the above-mentioned randomized controlled trial because of space availability and included nurses from other institutions.

Research questions: (1) What is the impact over time of a brief CRM class on the participants' sense of well-being, resiliency, secondary traumatic stress symptoms, and somatic symptoms, and (2) What are participant perceptions regarding the utility and applicability of the intervention?

## METHODS

### Participants

Participants were a convenience sample of community and hospital FLW who met inclusion criteria as health care, public safety, or social service providers, and who responded to an e-mail invitation sent to over 200 persons for a free CRM training. Some participants heard about the training and asked to attend. One hundred four persons responded to the invitation and completed the informed consent and a pretest survey. The majority of participants attended a single 3-hour long CRM class in Winter through Summer of 2018; some participants attended a shorter, more intensive session due to time constraints. Given the completion of 55 or more participants at the 3-month follow-up, the study was powered at 80% to detect moderate effect sizes (Cohen  $f=0.42$  and

$d=0.38$ ) for the longitudinal time effect and post hoc comparisons for improvements from baseline. The study was under powered at the 1-year follow-up point. The Institutional Review Board of the authors' university approved this unfunded study.

### Intervention

The CRM intervention is a manualized set of self-care skills and concepts<sup>17</sup> which were taught in a classroom. Participants received psychoeducation on the biological responses to stress and trauma (physical signs and symptoms) and gained tools to recognize and diminish these reactions. They learned CRM's concept of the Resilient Zone (RZ), an individual's bandwidth for stress tolerance, where it is possible to think clearly and work effectively. Leaving this internal state of balance is due to common stress responses of either excess sympathetic or parasympathetic discharge (Fig. 1). Learners developed an awareness of their autonomic nervous system state to identify and override the unpleasant sensations associated with distress, and, using CRM's 6 techniques, learned to shift into a restorative, parasympathetic state. Through practice, learners may experience greater self and other compassion because of a widened RZ and know how to return to their RZ when distressed.<sup>17</sup> Not only are CRM skills useful for self-calming (which may help calm others), but they may be used to teach patients, even in a conversational manner ("What is a source of strength for you right now?...As you talk about that, what do you notice happening in your body?").

The class was interactive in nature—with practice trying out the skills, for example, resourcing in pairs and eating a snack using the 5 senses. Three of the investigators, Certified CRM teachers, taught the class. See Table 1 for a list of the CRM skills. Participants were encouraged to access the free

**TABLE 1.** CRM Skills

Skill	Definition	Exemplar
Skill 1. Tracking	This is conscious awareness of body sensations, used for all of the CRM skills. This awareness can direct us to locate positive or neutral sensations in the body, or to notice sensations associated with the 5 senses, which can override the natural default of the mind to focus on negative sensations	While walking, I can focus on the strength in my legs; in a clinical situation, I can “sense-in” to my body, noticing sensations in my chest, abdomen, or limbs
Skill 2. Resourcing	The individual is asked to identify a memory, place, person, animal, or personal characteristic that brings a sense of peace, safety, joy, or calm, and then to describe a few qualities of this resource. The person is then asked to describe the sensations they are experiencing in their body when talking about the resource, including the sensations of breathing, heart rate, and muscle tension/relaxation	I recall a beach scene as a child and remember the salty smell, the crash of surf, the heat of the sun, the sand sticking to my arms. When I think about the scene, I take a deep breath and notice sensations of stability in my chest
Skill 3. Grounding	This is awareness of sensations of support and security in the present moment, being fully present in the body, consciously noticing supportive structures which provide an immediate anchor. Grounding can take place on-the-job, in movement or when still, noting sensations and tracking accompanying pleasant or neutral body sensations	I bring attention to the sensation of pavement under my feet on my way to the parking deck. When with patients, I notice the texture and temperature of the bedrail, my scrubs, my own skin
Skill 4. Gesturing	Gestures and spontaneous movements are natural, involuntary motions of the body that occur as expressions of internal sensations of distress or well-being. These spontaneous, comforting gestures, if used intentionally, help bring us into a resilient state	When I am stressed, I put my hand over my chest or rub my wrist or knuckles. I notice I take a deeper breath at that moment and feel more settled
Skill 5. Help Now!	Help Now! is an emotional CPR. This is a quick, focused activation of the senses by tuning in to environmental sensory stimuli: temperature, colors, textures, objects, and sounds of the environment. Help Now! skills are emergency strategies for individuals when they are in a very dysregulated or distressed state	When I feel overwhelmed, I name the colors or objects that I see in the room to myself. I also like to push with my arms against a wall, noticing the sensation of engaging the large muscles in my extremities and the resulting change in mood or internal state of distress
Skill 6. Shift and Stay	This involves selecting from the menu of grounding, tracking, resourcing, gesturing, or Help Now! skills depending on the needs of the situation and staying with the sensations associated with comfort and well-being, or less distress. The selection of a CRM technique may be made anytime the individual is experiencing unpleasant emotions and sensations, eg, feeling distressed, emotionally unstable, overwhelmed, or disconnected. Shift and Stay involves intentionally lingering with the experience until the unpleasant sensation and emotion abates	I was in a bad mood and thought of my beach resource, remembering the sensory details of that experience. I stayed thinking about it and noticing sensations for about 15 s and noticed a shift into a better emotional state

CRM indicates Community Resiliency Model.

CRM app (iChill), narrated by Miller-Karas, which covers all of CRM’s concepts and skills.

**Outcome Measures**

The pre-post survey included 4 valid and reliable quantitative instruments of physical and emotional health, collected before the training, and at 1 week, 3 months, and 1 year posttraining. The measures included:

- The World Health Organization-5 Well-being Index (WHO-5); 5-items 0–5; higher scores = greater well-being; range: 0–25; total scores multiplied by 4 to rescale from 0 to 100; cut-point of poor mental well-being < 50.<sup>23</sup>
- The Connor-Davidson Resilience Scale-10 (CD-RISC); 10-items 0–4; higher scores = greater resilience and stress tolerance; range 0–40; low resilience ≤ 29.<sup>24,25</sup>
- The Secondary Traumatic Stress Scale (STSS); 17-items of frequency of stress symptoms 1–5; higher scores = greater frequency; range of total STSS 17–85; higher total score = more secondary trauma; cutoff score of 38 or higher suggests that individuals are experiencing PTSD.<sup>26</sup>
- The Somatic Symptom Scale-8 (SSS-8); 8-items 0–4; range 0–32; cut points indicate none to minimal (0–3), low (4–7), medium (8–11), high (12–15), or very high (16–32) somatic symptom burden.<sup>27</sup>

Participant feedback regarding the learning experience was gathered at the end of the classes. Qualitative data were gathered electronically at each posttest, including frequency and type of skill use, and responses to the following: Can you give an example of how CRM was helpful to you? In what settings did you use CRM? The authors used simple cut and paste techniques to organize themes and examples of the responses.

**Statistical Analysis**

Participants entered presurvey and postsurvey data directly into the REDcap (Research Electronic Data Capture) system for data collection and management.<sup>28,29</sup> Descriptive statistics were computed for all demographics and final instrument scores at each survey time point. Internal consistency reliability was assessed for each instrument by computing Cronbach  $\alpha$  for item responses at baseline. Multilevel linear models were used to model the changes over time for repeated measures and adjust for missing data due to attrition over time, followed-up by post hoc tests performed using Sidak pairwise error rate adjustment.<sup>30</sup>

*P*-values for statistical tests are reported; however, emphasis has been placed on reporting effect sizes and clinically descriptive differences<sup>31</sup>; effect sizes (Cohen *d*)

**TABLE 2.** Participant Characteristics at Baseline and Over Time

Demographic Characteristics	Mean (SD)			
	Median [IQR], N (%)			
Age (range, 20–73 y)	34.7 (12.1)			
Years in role (range, 0–38 y)	3.0 [1.0–7.0]			
Female sex	95 (91.3%)			
Health care providers: physicians, staff, nurses, pharmacists, EMT	29 (27.9%)			
Students: medical, pharmacy, or nursing	39 (37.5%)			
Other: counselors, community advocates, chaplains, health educators, and other	36 (34.6%)			
Clinical risk factors	Baseline, N = 104	Post 1, N = 60	Post 2, N = 55*	Post 3, N = 27
Poor mental well-being on WHO-5 (<50)	48 (46.2%)	27 (45.0%)	23 (42.0%)	8 (29.6%)
Low resilience on CD-RISC ( $\leq 29$ )	62 (59.6%)	31 (51.7%)	30 (54.5%)	11 (40.7%)
Met all 3 criteria for secondary traumatic stress on STSS indicating possible PTSD by DSM IV criteria	39 (37.5%)	19 (31.7%)	14 (25.5%)	6 (23.1%)
High or very high somatic symptoms on SSS-8 ( $\geq 12$ )	29 (27.9%)	8 (13.3%)	10 (18.2%)	5 (18.5%)

\*One subject was missing WHO-5 scores at post 2 (n = 54).

CD-RISC indicates Connor-Davidson Resilience Scale; EMT, emergency medical technicians; PTSD, posttraumatic stress disorder; SSS-8, Somatic Symptom Scale-8; STSS, Secondary Traumatic Stress Scale; WHO-5, World Health Organization-5.

were computed based on the change scores from baseline to each follow-up time point<sup>32</sup> to evaluate small ( $d=0.2$ ), moderate ( $d=0.5$ ), and large ( $d=0.8$ ) effect sizes to interpret clinically meaningful improvements. Percentages of subjects whose scores improved from baseline were also reported. All computations were performed using IBM SPSS Statistics for Windows, Version 26.0 (IBM Corp, Armonk, NY).

## RESULTS

Participants were highly engaged in the trainings, and enthusiastic about using the simple skills, many wanting a longer class; 4 (physician, chaplains, and nurse) subsequently certified as CRM teachers themselves with the Trauma Resource Institute. Characteristics of participants are reported in Table 2. Of the 104 participants enrolled at baseline who attended the class, 73 completed at least 1 posttest. Of the 104 participants, 60 (57.7%) completed posttest 1 (1 wk), 55 (59.2%) completed posttest 2 (3 mo), and 27 (26.0%) completed posttest 3 (1 y). Findings are presented in Table 3. For the 4 outcomes, stress and somatic symptoms significantly improved from baseline with well-being also showing positive improvements:

- Well-being scores increased from an average of 47.0 (SD 17.7) to 57.2 (SD 18.3) by 1 year ( $P=0.056$ ), with more than 50% of the participants having higher scores at each posttest with small-to-moderate effects (Cohen  $d$  0.22–0.32).
- Resilience scores did not significantly change from baseline to 1 year ( $P=0.222$ ).
- For the STSS, the scores significantly decreased from 39.1 (SD 11.3) at baseline to 34.6 (SD 10.1) at 1 year ( $P=0.011$ ), with 52.7%–65% of the participants having lower scores at each posttest with a moderate effect size (Cohen  $d=0.49$ ) seen at 1 week post.
- Somatic symptoms scores also decreased significantly from 8.4 (SD 6.1) at baseline to 6.3 (SD 5.0) at 1 year ( $P=0.048$ ), with 37%–61.7% of the participants showing improvements at each posttest with the largest improvement occurring from baseline to 1 week ( $d=0.39$ ).

Across all 3 time points, the most-reported used skill was grounding, followed by tracking and resourcing. Use of the iChill app ranged from 10% (posttest 2) to 22% (posttest 3). Daily or weekly use of skills ranged from 49% (posttest 2) to 63% (posttest 1). Participants reported using the skills in personal and work situations and responses were related to better self-understanding, monitoring body sensations, regulating emotions, work-life balance, and use with patients. Themes and sample quotes are included in Table 4.

## DISCUSSION

In this study, a simple, somatic awareness training improved FLW well-being; after receiving the 1-time CRM intervention, study participants demonstrated significantly improved mental well-being and decreased secondary traumatic stress and somatic symptoms; these outcomes were sustained over 1 year. FLW experience barriers in accessing mental health care because of cultures of stoicism and self-reliance, stigma over psychological “weakness,” and fears of loss of confidentiality and job security.<sup>8</sup> For these reasons, FLW may be willing to engage in a simple strength-based resiliency training that explains distressing trauma responses as biological in nature and not due to mental weakness. In the COVID-19 pandemic, severe pressure, inadequate resources, moral conflicts, and fears of infection may lead FLW to moral injury, shame, guilt, disgust, low self-esteem, and chronic mental health problems.<sup>33</sup> Five health care workers’ needs from their organizations during the COVID-19 pandemic are: to be heard, protected, prepared, supported, and cared for.<sup>34</sup> Now may be an opportune moment for organizations to integrate trauma and resiliency competencies into medical, nursing, law enforcement, and first-responder training and professional development. These competencies, already developed by a national panel of nursing experts, may be adapted for other professions.<sup>35</sup>

The level of exposure to trauma among FLW has dramatically increased during the COVID-19 pandemic. Bolstering mental well-being for FLW via the least resource-intensive, prevention-focused interventions is crucial.<sup>36–38</sup> Programs

**TABLE 3.** Stress and Well-being Outcomes Among Front-line Workers Over 1 Year

Measure	Time	N	Mean (SD)	Multilevel Linear Model Time Effect	Changes From Baseline	Effect Size	Improved Rank	Percent Improved
					Mean (SD)	Cohen <i>d</i>	N Rank/Total	
WHO-5 C $\alpha$ 0.846	Baseline	104	47.0 (17.7)	$F_{3,161.5} = 2.575$			Positive rank	
	1 wk	60	50.5 (19.5)	$P = 0.056$	4.58 (14.12)	0.32	32/60	53.3
	3 mo	54	52.6 (19.6)		4.88 (22.39)	0.22	27/54	50.0
	1 y	27	57.2 (18.3)		6.85 (21.27)	0.32	15/27	55.6
CD-RISC C $\alpha$ 0.901	Baseline	104	28.4 (5.7)	$F_{3,148.8} = 1.480$			Positive rank	
	1 wk	60	28.9 (6.0)	$P = 0.222$	-0.03 (5.17)	0.005	27/60	45.0
	3 mo	55	28.8 (6.7)		0.48 (4.78)	0.10	26/55	47.3
	1 y	27	31.1 (5.3)		1.74 (4.83)	0.36	18/27	66.7
STSS total C $\alpha$ 0.923	Baseline	104	39.1 (11.3)	$F_{3,149.7} = 3.850$			Negative rank	
	1 wk	60	34.6 (9.5)	$P = 0.011$	-4.13 (8.41)	0.49	39/60	65.0
	3 mo	55	37.1 (10.8)		-1.12 (10.10)	0.11	29/55	52.7
	1 y	26	34.6 (10.1)		-2.87 (12.5)	0.23	16/26	61.5
SSS-8 C $\alpha$ 0.815	Baseline	104	8.4 (6.1)	$F_{3,147.8} = 2.672$			Negative rank	
	1 wk	60	6.8 (5.3)	$P = 0.050$	-1.51 (3.91)	0.39	37/60	61.7
	3 mo	55	7.1 (5.4)		-1.30 (4.96)	0.26	30/55	54.5
	1 y	27	6.3 (5.0)		-0.44 (5.21)	0.09	10/27	37.0

CD-RISC indicates Connor-Davidson Resilience Scale; C $\alpha$ , Cronbach  $\alpha$ ; SSS-8, Somatic Symptoms Scale-8; STSS, Secondary Traumatic Stress Scale; WHO-5, World Health Organization Well-being Scale.

such as CRM can provide immediate protection. CRM stands apart from other types of mindfulness interventions because of its pure and simple somatic focus; however, CRM will complement other wellness programs. CRM lends itself well to a virtual format; research is underway to test a 1-hour, virtual

CRM training. Future avenues of investigation include: mode of delivery (single vs. multiple sessions; in-person vs. virtual; booster doses), objective measures of emotion regulation (galvanic skin response, heart rate variability, or salivary cortisol), and organizational-level implementation. CRM may be of value

**TABLE 4.** Participants Responses Regarding Their Use of CRM Skills

Themes	Sample Quotes
Understanding self	<p>... identify when I am nearing the edge of my tolerance, and have attempted to pinpoint what shrinks my resiliency zone (student nurse)</p> <p>Tracking makes me aware of various bodily sensations, pausing to see what they mean (physician)</p> <p>...staying in the present and being aware of how emotions affect outlook (nurse practitioner)</p> <p>...understanding what's going on in my body helps me navigate through it (health educator)</p>
Being aware of body responses	<p>...noticing the sensations I feel and the environment (student nurse)</p> <p>...(having) a contentious issue at work, was able to track visceral sensations and then ground myself (physician)</p> <p>...able to name it and take control by grounding, breathing, and focusing on the positive (counselor)</p> <p>...aware of how my body reacts under stress (student nurse)</p> <p>More aware of my body, breathing, and actions (health educator)</p> <p>...checking in with my body and paying attention to my heart rate (counselor)</p>
Handling anxiety and stress	<p>...use when things get hectic and I feel overwhelmed and stressed (health educator)</p> <p>Quick and easy ways to keep my emotions in check (health educator)</p> <p>...felt a panic attack coming on and used the grounding method, by tracing [a] figure on my thigh, and I was calmed (student nurse)</p> <p>When my anxiety takes over, the CRM helps bring me back to a baseline (student nurse)</p> <p>...aware of how I felt when I was feeling anxious and imagined a beach setting and felt relaxed (student nurse)</p> <p>Quick and easy ways to keep my emotions in check (student nurse)</p> <p>Knowledge/ability to calm myself (health educator)</p> <p>...thinking about the colors in the room and the sensations I was feeling and it really did help me to calm down (student nurse)</p>
Balancing work/life	<p>Helpful in allowing me to keep my balance and keep going (nurse practitioner)</p> <p>Techniques to help me fall asleep and to help me stop ruminating (nurse practitioner)</p> <p>...used the grounding method in almost all settings of my daily life (student nurse)</p> <p>Skills to keep myself in the resilient zone on a daily basis (health educator)</p>
Practicing holistic care	<p>Discussing with patients about their own stress (physician)</p> <p>...use after dealing with difficult disclosures from clients (counselor)</p> <p>Acknowledge the scary feelings that patients may have and to try to help them get through it (nurse practitioner)</p> <p>...remain calmer while interacting with very distraught clients (nurse)</p> <p>...able to teach others how to ground themselves (counselor)</p>

CRM indicates Community Resiliency Model.

to organizations to create a common language around resilience and shift to a model of systemic empathy.

## Limitations

This research was conducted with a nonrandom, non-controlled sample, using only self-report measures. The posttest sample sizes diminished over time, lowering the statistical power to detect significant differences. The study was insufficiently powered at the 1-year point, so those data are descriptive only; a future larger study needs to be done to determine long-term effects with better statistical power. Motivational factors contributing to selection bias are unknown. Few men, paramedics, and police enrolled in the study; few participants accessed the iChill app. Finally, heterogeneity of the sample reduced specificity of the research findings.

## ACKNOWLEDGMENTS

The authors wish to thank the study participants, Connie Buchanan, Richard Higgins, and Drs Jordan Murphy, Sandra Dunbar, Anita Nelson, and Terence Chorba for their encouragement and support. The authors wish to acknowledge the Mundito Foundation for earlier funding that inspired this study.

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