

## Research Brief

# Development and Evaluation of an Online Toolkit for Managers of 9-1-1 Emergency Communications Centers to Reduce Occupational Stress

Hendrika Meischke, PhD, MPH<sup>1</sup> 

Megan Rogers, MS<sup>1</sup>

Sarah Manchanda<sup>1</sup>

Jeanne M. Sears, PhD, MS<sup>1</sup>

Debra Revere, MLIS, MA<sup>1</sup>

Riana Grewal<sup>1</sup>

Randal Beaton, PhD, EMT<sup>1</sup>

This article describes the development and evaluation of an online workplace stress reduction toolkit for use by managers of 9-1-1 emergency communication centers (ECCs). A three-step process for development and testing of digital learning resources was used: (1) establishing need and focus through ECC manager stakeholder engagement, (2) pretesting of the toolkit with the target ECC manager audience, and (3) toolkit utilization and evaluation. The toolkit was developed in close partnership with stakeholders throughout the entire process. Toolkit usage was documented via registration data. The evaluation utilized an online survey that included closed and open-ended questions, which were analyzed using descriptive statistics and qualitative thematic analysis. Over a 20-month period, 274 people registered for the toolkit and, of those, 184 (67%) accessed the content. Respondents to the evaluation survey ( $N = 156$ ) scored the toolkit highly on satisfaction, self-efficacy, and perceived utility measures. Survey respondents reported intent to apply toolkit content through the following: providing organizational resources to help workers take better care of themselves (41%); creating a lower stress worksite environment (35%) and sharing resources with staff to (1) reduce stress (19%), (2) support conflict resolution (21%), and (3) prevent and/or stop bullying (17%). In delivering actionable content to ECC managers, the

toolkit shows promise in addressing and mitigating occupational stress in ECCs. Further research needs to determine the relationship of this strategy for reducing ECC stress.

**Keywords:** occupational stress; 9-1-1 dispatch; worksite wellness; digital intervention; evaluation

Public safety relies on 9-1-1 emergency communications center (ECC) telecommunicators (TCs) who must maintain the cognitive and emotional resources needed to perform multiple, complex, tasks and make time-urgent life and death decisions while managing their own and their callers' stress (Davis, 2005). Like the first responders they support, TC work is characterized by high demand and low control and

<sup>1</sup>University of Washington, Seattle, WA, USA

**Authors' Note:** The authors acknowledge the people—past, present and future—of the Dkhw'Duw'Absh, the Duwamish Tribe, the Muckleshoot Tribe, and other tribes whose traditional lands they study and work. This work was (in part) supported by National Institute for Occupational Safety and Health (NIOSH)/Centers for Disease Control and Prevention (CDC) grant number ROH010536 (PI: Meischke). Its contents are solely the responsibility of the authors and do not necessarily represent the official view of NIOSH, CDC, or the Department of Health and Human Services. Address correspondence to Hendrika Meischke, Department of Health Services, University of Washington, 1959 NE Pacific Street, Seattle, WA 98195, USA; e-mail: hendrika@uw.edu.

### Health Promotion Practice

March 2023 Vol. 24, No. (2) 360–365

DOI: 10.1177/15248399211042332

Article reuse guidelines: [sagepub.com/journals-permissions](https://sagepub.com/journals-permissions)

© 2021 Society for Public Health Education

routine exposure to intense workplace stressors such as vicarious traumata. These workplace experiences are associated with a range of adverse psychological and physical health consequences (Golding et al., 2017; Lilly et al., 2019), including high levels of peritraumatic distress, a condition that is consistent with “probable posttraumatic stress disorder (PTSD)” (Lilly & Pierce, 2013; Pierce & Lilly, 2012) associated with exposure to direct and indirect acute and chronic occupational stressors.

For TCs these adverse outcomes are costly in terms of their health, employment, and retirement. The ECC industry has extraordinarily high employee turnover rates with approximately one in five employees leaving the field each year (Taylor et al., 2009) and only 3% of TCs staying in their job until reaching their full retirement age (APCO, n.d.). To deter the onset and progression of adverse health outcomes in this public safety worker population, developing and testing interventions that comprehensively address sources of occupational stress in ECCs is needed.

There is growing evidence that worksite wellness programs can improve workers’ mental health (Carolan et al., 2017), yet few programs to date have focused on ECC organizations (Golding et al., 2017; Lilly et al., 2019). Managers are the “backbone” of an organization; research supports the basic premise that managers understand the value of mental health-related training for themselves and for employees (Gayed et al., 2018). It follows that ECC managers may be uniquely positioned to make organizational changes and to encourage individual worker engagement with stress reduction interventions.

## ► PURPOSE

This article describes the development and evaluation of an online occupational stress reduction toolkit (i.e., a collection of digital learning tools, guidance, and resources) targeted at ECC managers.

## ► METHOD

The toolkit was designed using a three-step rapid digital learning resource development and testing process (Blake et al., 2020), as follows: Step 1 establishes the need for and identification of the broad areas of content for incorporation into the digital learning resource, Step 2 focuses on beta testing of the digital resource, and Step 3 includes a demonstration of the extent to which the digital learning resource can be delivered to the target audience as intended and determines acceptability, usability, and utility of the resource by the target audience.

The plan for conducting this work was reviewed by the University of Washington Institutional Review Board, which reached a determination that the evaluation was not human subjects research.

## Step 1

In 2013, a new federal mandate was announced—“Next Generation 9-1-1” (NG911)—which sought to transition all ECCs from analog to digital communication technologies, including augmenting voice phone interactions with text and allowing for transmission of video stream and incident scene digital photos during an emergency call. Discussions with key stakeholders regarding potential impacts of NG911 technologies on already high TC stress levels and turnover rates revealed widespread concern of the mandate. Need for a toolkit was established by TC observations at various ECCs in a Pacific Northwest state, an online survey distributed to TCs at 4 ECCs, and a national online survey of ECC managers.

Informal interviews with TCs during observations at ECCs in a Pacific Northwest (NW) state revealed the extent to which TCs were proud to be an integral part of the first emergency response communication chain. However, job strain, lack of recognition, and all too frequent conflictual and hostile interactions with citizen callers, were ubiquitous and chronic occupational stressors. Analysis of the online TC survey ( $N = 154$  TCs) indicated that high levels of effort, overcommitment (excessive work-related commitment and a high need for approval), and technostress (stress arising from working with complex and often changing computer technology) were positively correlated with self-reported symptoms of stress (Meischke et al., 2015). Integration of the evidence obtained through our observations and survey suggested that ECCs are stressful workplaces even without the advent NG911 technology changes.

These findings informed development of a survey to prioritize content areas for inclusion in a toolkit. With assistance from members of the National Emergency Number Association (NENA) Task Overload Workgroup, an online survey was distributed nationally to a group of ECC managers. The survey asked respondents to rate (on a scale from 1 to 5 where 1 = *not very useful* and 5 = *very useful*), content areas they perceived as most useful for inclusion in a stress reduction toolkit for ECC managers. Based on the feedback of 42 ECC manager respondents, the following “high priority” toolkit modules were developed: (1) worksite wellness (ergonomics, noise in ECCs, stress, treadmills at work, worksite wellness programs, worksite flu vaccine information)

(score of 4.1/5); (2) conflict management (4.7/5), including bullying (4.5/5); (3) technostress (4.2/5); and, (4) self-care and resources for preventing and/or coping with stress (4.4/5).

In conclusion, outcomes of Step 1 activities established the need for and prioritized content areas for a toolkit on worksite stress management strategies for ECCs.

### **Step 2**

Toolkit content was informed by (1) evidence-based strategies for addressing occupational stress identified in the literature; (2) expert opinions from clinical psychologists, an occupational/environmental health fellow and an expert on the causes and effects of occupational stress among other first responder populations; and (3) the results of the ECC manager survey (Step 1). The digital format (per request of our stakeholders) and delivery were mounted by a professional e-learning team at the Northwest Center for Public Health Practice (NWCPHP).

The toolkit was developed using principles of self-efficacy theory, which suggests that confidence in one's ability to perform an action is a significant predictor of behavior change (Bandura, 1982). As such the toolkit was designed to be specific to the ECC environment, provide strategies that are low cost and relatively easy to implement by a manager, and instill a high level of confidence in their ability to execute the desired actions.

The digital learning resource was beta-tested by ECC managers to assess engagement with the toolkit and evaluation. Thirty-five managers from ECCs located in a NW state were recruited to utilize the online toolkit. A survey conducted 3 months postutilization asked managers to report which toolkit modules they accessed. The survey also asked managers to rate the modules on a scale from 0 (*worst*) to 100 (*best*). Nineteen managers (54% response rate) completed the survey.

Of the 19 manager respondents, 12 had accessed the toolkit (63%). Although the most frequently accessed modules were (1) worksite wellness (47%) and (2) overtime (47%), the personal resources module received the best (score of 81 of 100), followed by the worksite wellness module (76 of 100).

In conclusion, outcomes of Step 2 provided feedback regarding toolkit access and relevance of its content for addressing occupational stress. The toolkit including five modules, is hosted on the NWCPHP learning management system (LMS) and can be accessed at no cost at: <http://www.nwcphp.org/training/reducing-stress-a-toolkit-for-9-1-1-call-center-managers>.

Figure 1 depicts a screenshot of one of the modules.

### **Step 3**

In fall 2018, an announcement of the toolkit's availability with the link to the NWCPHP hosting site was distributed nationwide through existing ECC partnerships, conferences, social media (listserv, Facebook) and in trade and academic journal articles. To access the toolkit, individuals were required to register at the NWCPHP website. After participants accessed all toolkit modules a certificate of completion was disbursed. Participants were also asked to complete an online evaluation survey that asked questions regarding satisfaction with the training, confidence in their ability to implement recommended changes (self-efficacy), and perceived utility of the training.

*Measures.* Data collected by the NWCPHP's LMS to assess standard process measures such as dose delivered (number of course registrants) and dose received (number of registrants who completed the course). To measure satisfaction, self-efficacy, and perceived utility, the survey included several Likert-type scale items (see Tables 1 and 2) as well as open-ended questions assessing intentions to implement any recommendations. Responses to open-ended questions were qualitatively analyzed using a codebook created based on an initial reading by one coder (RG), who then trained a second coder (HM). Both coders independently coded 10 responses and discussed disagreements. One of the coders (RG) subsequently coded all the responses.

*Results.* Between November 2018 and June 2020, 274 individuals registered to access the "Reducing Stress: A Toolkit for 9-1-1 Call Center Managers" toolkit and 184 (67%) completed all toolkit modules. Of the 184 participants, 165 (85%) completed the evaluation survey.

Table 1 shows that the majority of survey respondents reported high scores on the satisfaction measures. In addition, 95% reported the quantity of information presented in the course was "about right," and that the complexity of the course was "about right." Most respondents (51%) reported they completed the training in less than 1 hour, 43% between 1 and 2 hours, and 6% between 2 and 3 hours.

Table 2 shows that respondents reported increased self-efficacy in all toolkit training domains, with the highest reported increase in conflict management and in listing actions for managers that can improve stress in 9-1-1 TCs. Regarding perceived utility, that is, relevance of the course materials for day-to-day ECC manager work, 81% of respondents reported they identified

## So What Can You Do?

Research shows that managers can take specific steps to help employees reduce and deal with stress.<sup>2</sup> This toolkit gives you tools and resources to help reduce and manage the job stress your employees face.

Click [here](#) to learn more about this toolkit and how to use it to reduce stress levels in your call center. Or click on one of the topics below to start exploring ways to reduce stress and improve health and wellbeing for all your employees.



### Understanding Stress

This section will help you build an understanding of stress on the job, how it may impact your call center, and how call center managers can take general steps to create a less stressful work environment.



### Operations

Operational issues can be a major source of stress, particularly new technology adoption and mandatory overtime. This section will show you best practices for dealing with operational challenges.



### Conflict

The social environment is an important factor that can increase or decrease stress. This section will give you tools to help avoid and reduce conflict between employees, conflict with callers, and bullying.



### Promoting Wellness

This section will help you create a wellness program that gives employees opportunities for physical exercise, healthy eating, and other positive health actions at work.



### Resources

This section includes information about this toolkit and how to use it, references and links to external sources for more information, and tips for personal stress reduction.



### Managing Stress

This page provides methods for managing symptoms of stress, including breathing exercises, meditation, and sleep help, to share with employees—and use yourself.

← PREVIOUS

NEXT →

FIGURE 1 Screenshot of one of the “Building a Worksite Wellness Program” modules

**TABLE 1**  
**Satisfaction With the Toolkit (N = 156)**

<i>Please rate your level of agreement with the following statements:</i>	<i>Strongly disagree, %</i>	<i>Disagree, %</i>	<i>Neutral, %</i>	<i>Agree, %</i>	<i>Strongly agree, %</i>
I was satisfied with this course overall	3	1	9	63	24
I will recommend this course to other professionals	2	2	15	46	35
The information was presented in ways I could clearly understand	1	1	5	58	35
My understanding of the subject matter has improved as a result of having participated in this training	3	3	18	60	17

**TABLE 2**  
**Self-Efficacy Beliefs Related to the Training Content**

*Self-efficacy questions: To what extent did your confidence relate to the following change as a result of participating in the course?*

<i>Toolkit training domain</i>	<i>Much less confident, %</i>	<i>Slightly less confident, %</i>	<i>Confidence unchanged, %</i>	<i>Somewhat more confident, %</i>	<i>Much more confident, %</i>
Describe the effects of job-related stress on 9-1-1 TCs	0	0	35	44	21
Recognize and respond to job-related trauma in 9-1-1 TCs	0	1	27	51	21
List actions for managers that can improve stress in 9-1-1 TCs	0	1	15	57	28
List ways to reduce the stress associated with implementation of new technology	0	1	22	50	27
Describe effective approaches to managing staffing needs to avoid stress due to overtime work	0	1	30	46	23
Apply conflict management strategies to conflicts between employees	0	1	19	53	28
Create a policy to prevent and respond to workplace bullying	0	1	25	46	28
Create a workplace wellness program to encourage physical activity and good nutrition	0	1	30	45	25
Plan to hold a flu shot clinic as a PSAP	3	3	46	30	18

*Note.* TC = telecommunicator; PSAP = public safety answering point.

specific actions for applying information from the training in their work.

Specifically, a total of  $N = 113$  respondents provided examples of how they expected to use the information they learned into their work: providing organizational resources to help their workers take care of themselves (41%); creating a lower stress worksite environment (35%), providing direct support to staff (27%); sharing

resources with staff to help them reduce stress (19%), conflict resolution/management (21%), and preventing and stopping active bullying (17%).

## ► DISCUSSION

The process undertaken for developing this toolkit demonstrates the value of designing in collaboration

with a digital learning resource's target audience. The toolkit provided relevant and actionable organizational resources to managers, who are the ECC organizational "backbone" and in the primary position to institute meaningful changes. The most frequently reported intended actions for implementation at their ECCs related to sharing resources and creating a less stressful work environment. Conflict management and addressing workplace bullying were some specific actions that managers reported they would engage in to reduce occupational stress for their TCs.

### Limitations

Although 84% of those who accessed all the toolkit modules completed the evaluation, the results presented may not be wholly representative of all ECC managers who used the toolkit. Another limitation of the evaluation is it only asked for intentions to make changes, not reporting of actual changes and, if so, how these changes affected ECC managers and/or TC health.

### Implications for Practice

We targeted ECC managers because of their important duties, essential tasks, and roles within the organization. Managers are uniquely positioned to influence individual employees, to inform and educate their peers and to protect and improve the health and safety of their organization.

### Implications for Research

Additional research is needed on the drivers of engagement in online training platforms and ways to better assess adoption, implementation, and the assessment of the outcomes of stress reduction actions posttraining.

## ► CONCLUSION

The online toolkit was well received by ECC managers and offered actionable suggestions for reducing occupational stress in their work environment. More intentional outreach to ECCs might increase the access to and impacts of the toolkit.

### ORCID iD

Hendrika Meischke  <https://orcid.org/0000-0002-1683-2720>

## REFERENCES

- APCO. (n.d.). *HR, staffing & retention*. <https://www.apcointl.org/resources/staffing-retention/>
- Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, 37(2), 122–147. <https://doi.org/10.1037/0003-066X.37.2.122>
- Blake, H., Bermingham, F., Johnson, G., & Tabner, A. (2020). Mitigating the psychological impact of COVID-19 on healthcare workers: A digital learning package. *International Journal of Environmental Research and Public Health*, 17(9), 2997. <https://doi.org/10.3390/ijerph17092997>
- Carolan, S., Harris, P. R., & Cavanagh, K. (2017). Improving employee well-being and effectiveness: Systematic review and meta-analysis of web-based psychological interventions delivered in the workplace. *Journal of Medical Internet Research*, 19(7), e271. <https://doi.org/10.2196/jmir.7583>
- Davis, J. B. (2005). Finding calm after the call: Putting out fires all day? These 911 dispatchers know how to cope. *ABA J*, 91, 75.
- Gayed, A., Milligan-Saville, J. S., Nicholas, J., Bryan, B. T., LaMontagne, A. D., Milner, A., Madan, I., Calvo, R. A., Christensen, H., Mykletun, A., Glozier, N., & Harvey, S. B. (2018). Effectiveness of training workplace managers to understand and support the mental health needs of employees: A systematic review and meta-analysis. *Occupational and Environmental Medicine*, 75(6), 462–470. <https://doi.org/10.1136/oemed-2017-104789>
- Golding, S. E., Horsfield, C., Davies, A., Egan, B., Jones, M., Raleigh, M., Schofield, P., Squires, A., Start, K., Quinn, T., & Cropley, M. (2017). Exploring the psychological health of emergency dispatch centre operatives: A systematic review and narrative synthesis. *PeerJ*, 5, e3735. <https://doi.org/10.7717/peerj.3735>
- Lilly, M., Calhoun, R., Painter, I., Beaton, R., Stangenes, S., Revere, D., Baseman, J., & Meischke, H. (2019). Destress 9-1-1-an online mindfulness-based intervention in reducing stress among emergency medical dispatchers: A randomised controlled trial. *Occupational and Environmental Medicine*, 76(10), 705–711. <https://doi.org/10.1136/oemed-2018-105598>
- Lilly, M. M., & Pierce, H. (2013). PTSD and depressive symptoms in 911 telecommunicators: The role of peritraumatic distress and world assumptions in predicting risk. *Psychological Trauma: Theory, Research, Practice, and Policy*, 5(2), 135–141. <https://doi.org/10.1037/a0026850>
- Meischke, H., Painter, I., Lilly, M., Beaton, R., Revere, D., Calhoun, B., Seeley, K., Carslay, Y., Moe, C., & Baseman, J. (2015). An exploration of sources, symptoms and buffers of occupational stress in 9-1-1 emergency call centers. *Annals of Emergency Dispatch & Response*, 3(2), 28–35.
- Pierce, H., & Lilly, M. M. (2012). Duty-related trauma exposure in 911 telecommunicators: Considering the risk for posttraumatic stress. *Journal of Traumatic Stress*, 25(2), 211–215. <https://doi.org/10.1002/jts.21687>
- Taylor, M. J., Gardner, V., & McCombs, B. (2009). *Staffing and retention in public safety communication centers: A national study*. University of Denver Research Institute on behalf of APCO Project RETAINS.