

Short-Term Impact of a Stress Management Course on Shipboard Sailors

Karen Tannenbaum, MA^{1,2}

Jessamyn E. Boltz, MPH^{1,2}

Sarah R. Carinio, BS^{1,2}

A. C. Del Re, PhD^{1,2}

Jayson M. Rhoton, LT, MSC, USN/PhD²

Suzanne L. Hurtado, MPH²

Abigail M. Yablonsky, CAPT, NC, USN/PhD, NP-C^{2,3}

¹Leidos, Inc., San Diego, CA

²Naval Health Research Center, San Diego, CA

³Naval Medical Center, San Diego, CA

Health and Behavioral Sciences Department

Naval Health Research Center

140 Sylvester Road

San Diego, CA 92106-3521

Disclaimer: I am a military service member or employee of the U.S. Government. This work was prepared as part of my official duties. Title 17, U.S.C. §105 provides that copyright protection under this title is not available for any work of the U.S. Government. Title 17, U.S.C. §101 defines a U.S. Government work as work prepared by a military service member or employee of the U.S. Government as part of that person's official duties.

Report No. 20-105 was supported by the Defense Health Agency under work unit no. N1808. The views expressed in this article are those of the authors and do not necessarily reflect the official policy or position of the Department of the Navy, Department of Defense, nor the U.S. Government.

The study protocol was approved by the Naval Health Research Center Institutional Review Board in compliance with all applicable Federal regulations governing the protection of human subjects. Research data were derived from an approved Naval Health Research Center Institutional Review Board protocol, number NHRC.2019.0016.

EXECUTIVE SUMMARY

Background: As part of their day-to-day operational mission, shipboard Sailors experience unique stressors that can affect their health and readiness. The U.S. Navy has recognized the need to reduce Sailors' stress to maintain safe working conditions and to optimize their communication, performance, and readiness. The San Diego Fleet and Family Support Center (FFSC) conducts in-person classes to improve stress management among Sailors; the stress management course covers causes and consequences of stress, a review of the Navy Operational Stress Control model, and information on basic stress management skills. This class has not been rigorously evaluated to determine its impact on Sailors' ability to manage stress. The purpose of this study was to evaluate the short-term impact of the FFSC stress management class on: 1) Sailors' stress management knowledge, 2) Sailors' intention to share knowledge from the class with others, and 3) Sailors' satisfaction with the class.

Method: Shipboard Sailors ($N=95$) who attended a stress management course completed pretest and posttest assessments that measured workplace stress, current stress management behaviors, stress management knowledge, intention to share and use course information, and participant satisfaction with the course. Most ratings were made on a 5-point (1 to 5) scale, where higher scores indicated more positive outcomes.

Results: In the aggregate, participants gave the class high marks ($M = 3.81$, $SD = 0.66$), gave positive ratings of the class instructor ($M = 3.84$, $SD = 0.67$), and were satisfied with the class ($M = 4.05$, $SD = 0.63$); Sailors also reported that the class was relevant to their work ($M = 3.64$, $SD = 0.81$). Overall, 80% of class participants intended to share information learned in the class with family members and military friends, potentially extending the reach and impact of the FFSC class. Of note, however, Sailors did not show increased stress management knowledge as a result of taking the FFSC stress management class ($p=0.31$).

Conclusion: This study was the first evaluation of the short-term impact of the FFSC Stress Management course on the stress management knowledge of shipboard crews. Study limitations prevented us from assessing the long-term impact of the stress management course on future stress levels and stress abatement behaviors. However, results suggest some positive short-term effects, including the intention to share and use course information, and satisfaction with the class and FFSC instructors. Recommendations are made to enhance future evaluations of FFSC classes for service members.

ACKNOWLEDGMENTS

Naval Health Research Center (NHRC) would like to express our sincere appreciation to the Sailors who volunteered their time to participate in this study. We would also like to acknowledge the Director of the Fleet and Family Support Center (FFSC) San Diego, Ms. Janet Paulovich, and her colleagues, as well as the Life Skills Instructors, for their collaboration in this study. Additionally, we would like to acknowledge the valuable assistance of our staff data collectors: Ms. Robyn Englert, Ms. Vanessa Perez, and Ms. Bianca Colon.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	2
ACKNOWLEDGMENTS	3
I. INTRODUCTION	1
a. Problem statement	1
b. Background.....	1
c. Purpose of study	2
II. METHODS	2
a. Evaluation design and study setting	2
b. Participants	2
c. Intervention.....	3
d. Data collection and procedures.....	3
e. Survey measures	4
i. Sociodemographic and military characteristics	4
ii. Goals for attending the class	4
iii. Workplace Stress Scale	4
iv. Stress Management Strategies	4
v. Stress Management Knowledge.....	5
vi. Intention to use and share information from the course.....	5
vii. Global Course Evaluation Scale	5
f. Analytic strategy.....	6
III. RESULTS	6
a. Participation	6
b. Sample characteristics	6
Table 1. Sociodemographic and military characteristics of FFSC Stress Management class attendees.	7
c. Descriptive statistics and associations	9
Table 2. Correlations (Pearson's r) among study variables at baseline.....	11
d. Key evaluation outcomes	11
Table 3. Key evaluation outcomes for FFSC Stress Management class participants (N=95).	12
Figure 2. Intentions to share information learned during the FFSC Stress Management course with others (N=81). Note. Participants could select all that apply.	13
e. Exploratory analyses	13
IV. DISCUSSION	13

a. Overview of findings	13
b. Limitations.....	15
c. Recommendations for future evaluations	15
V. CONCLUSIONS	17
VI. REFERENCES	19
viii. APPENDIX	1
a. Global Course Evaluation Measure	1

I. INTRODUCTION

a. Problem statement

Shipboard Sailors experience unique stressors as part of their day-to-day operational mission, which can affect their health and readiness, and in some cases can affect the entire crew. In the summer of 2017, there were four collisions involving Navy ships in the Pacific, two of which together resulted in the deaths of 17 Sailors. The Navy conducted a comprehensive internal review to identify modifiable and non-modifiable factors that may have contributed to the collisions. The subsequent report identified deficiencies in preparing shipboard personnel to effectively manage stress, and a paucity of sufficient training programs to address stress management in the surface force (United States Fleet Forces Command, 2017, Section 8.2.3). The findings in the collision report are supported in the research literature, which suggests that poor stress management contributes to mishaps (Day et al., 2012; Millegan et al., 2016). The U.S. Navy has recognized the need to effectively manage stress in order to optimize performance and maintain safe working conditions; this recognition has led to the creation of programs designed to reduce stress for specific communities (e.g., aviation, surface warfare) (O'Connor, 2011; McClernon et al., 2011). These programs have produced mixed results. In a more broadly targeted effort, Fleet and Family Support Centers (FFSCs) also provide a stress management class to Sailors, both as general military trainings and in response to specific command requests. However, the effectiveness of this FFSC class for improving Sailors' stress management has not been evaluated. Given the high-pressure environment of shipboard life, it is imperative to make sure that classes given to Sailors are a good use of limited training time onboard.

b. Background

Despite a growing emphasis on creating a culture of safety aboard Navy surface ships, mishaps continue to arise. According to the Naval Safety Center, from 2002 through 2013, there were 1,053 mishap fatalities and 394 Class A mishaps totaling \$5.2 billion in damages (Norton, 2014). Class A mishaps were defined as mishaps resulting in either at least \$1 million in damages to equipment or serious injury/loss of life. Some have espoused the view that mishaps are caused by insufficient knowledge and skills, or that crew members are simply "accident prone" (Day et al., 2012; Miranda, 2018). However, these views fail to capture the role that unmanaged stress may play in contributing to mishaps.

FFSC originated in 1979 to "support Sailor and family resiliency" (Commander, Navy Installations Command [CNIC], n.d.); the FFSC offers resources to enhance personal skills, such as managing the stresses of military life and enhancing personal resilience. Services offered by the San Diego FFSC also include deployment support, employment assistance, and life skills classes (San Diego Military Family Collaborative (n.d.); San Diego Navy Life Southwest, n.d). FFSC leadership engages in ongoing communication with shipboard leadership regarding training needs, and FFSC San Diego is often asked to provide Stress Management classes to the

Pacific Fleet. FFSC's Stress Management curriculum was developed by CNIC and uses the Navy's Operational Stress Control continuum to encourage use of effective coping strategies in high-stress environments and keep Sailors mission ready (CNIC, n.d.). In this study, NHRC conducted the first-ever formal evaluation of the short-term impact of a stress management class offered to shipboard crews by the San Diego FFSC.

c. Purpose of study

The purpose of the study was to evaluate the short-term impact of an FFSC stress management class on Sailors' stress management and to assess their satisfaction with the course. The specific research questions addressed in this study are as follows:

Research Question 1 (RQ1): *What are the short-term effects of the stress management training on Sailors' stress management-related knowledge?*

Research Question 2 (RQ2): *What are the short-term effects of the stress management training on Sailors' intention to share course information with others?*

Research Question 3 (RQ3): *What is the level of participant satisfaction with the course content and course delivery?*

This evaluation and assessment of participant satisfaction with the class are intended to provide empirical evidence of the short-term impact of the class, which FFSC may use to enhance future program development and course implementation efforts.

II. METHODS

a. Evaluation design and study setting

This study utilized a single-group pretest-posttest design to assess the short-term impact of the FFSC stress management class on participants. A total of six course administrations were evaluated in this study. The courses were given over a two-month time period in 2019 and were conducted in designated spaces aboard two Navy ships, both docked at Naval Base San Diego. Crew members invited to attend the stress management course were required to muster in a designated course location. Once seated, each Sailor in attendance was provided with an electronic tablet loaded with an informed consent form, pretest assessment, and posttest assessment.

b. Participants

The participants in this study were volunteer crew members from two Navy ships, a destroyer, and a guided missile cruiser. The course was provided by FFSC Life Skills instructors aboard the naval vessels at the request of the ships' leadership either 1) for general military training, or 2) in response to a perceived need (e.g., increased stress among the crew).

c. Intervention

The Stress Management course content was developed by CNIC. The “ABC” model posited by Albert Ellis (1973; 2001), developed as a component of Cognitive Behavioral Therapy (CBT), was used as the conceptual framework in the development of the Stress Management course. Specifically, the ABC model suggests that activating events (A) are not responsible for subsequent emotions and behaviors (B), but rather, one’s cognitions (C) surrounding the interpretation, processing, and evaluation of these events are directly linked to behavioral responses (Oltean et al., 2017). With these principles in mind, the Stress Management course is designed to help Sailors identify sources of tension or pressure and select strategies to interpret these events in ways which avoid overly negative emotional or behavioral outcomes (i.e., maladaptive coping, increased anxiety).

The Stress Management course instructor manual contains lecture material and a toolkit of activities that instructors can easily adapt for each course based on time allotted, number of learners, audio/visual equipment capabilities, and room size. The course begins with an instructor introduction and a review of course objectives. Specifically, Sailors are informed that the course will help them to: (1) rate their personal stress and compare their own stress levels to the Operational Stress Control stress zones, (2) manage thoughts in order to reduce personal stress levels, (3) manage actions to reduce personal stress levels, and (4) take personal responsibility for positive change. This course content is taught in three course sections, including understanding stress (e.g., what causes stress and what are the consequences of stress), a review of the Operational Stress Control model, and information on basic stress management skills. Each section includes an activity and discussion to facilitate active learning. Class instructors may spend greater or lesser amounts of time on each section based on their own judgment and the time allotted by the ship for the training.

d. Data collection and procedures

An informed consent discussion was conducted with the group of class participants prior to the start of study activities. At that time, a study staff member made a verbal announcement about the study and described study procedures. Crew members were given time to review the informed consent forms on the tablets and ask study staff questions about the research. Study staff were dispersed around the learning environment, and hard copy consent forms were offered to any crew members that wanted a copy for their records. Prior to the course, crew members who consented to participate in the study continued on to complete an anonymous 10-minute pretest assessment, while crew members who did not provide consent to participate were instructed to simply place their tablets face down on a table in front of them or underneath their seats. Next, crew members received a 1- to 2-hour Stress Management course that included didactic lecture-based material as well as interactive activities and group discussion. At least two NHRC study staff members observed the class and recorded field notes based on their observations. At the end of the course, consenting participants were invited to complete the posttest assessment on the study tablets. All assessment questions were voluntary, and participants were permitted to end their participation at any time or skip questions within the

assessments if they chose to do so. Study staff collected the tablets upon completion of the posttest assessment. After each class, the study staff conducted a team debriefing meeting, at a location separate from where the class was held, to discuss and finalize field notes.

e. Survey measures

Survey measures covered several domains, including sociodemographic and service-related characteristics, workplace stress, stress management knowledge and behaviors, impressions of the course (e.g., satisfaction, relevance).

- i. Sociodemographic and military characteristics
Sociodemographic items assessed at pretest included gender, age, race and ethnicity, marital status, number of children, and educational level. Service-related characteristics assessed at pretest included the year participants joined the military, their rank, time at their current duty station, number of permanent changes of station (PCS) since joining the military, number of deployments during military service, expected upcoming deployments, and time away from home due to deployments and trainings while at their current command.
- ii. Goals for attending the class
Participants were asked about their goals for the class in the pretest assessment. Examples of the response options included, “acquire new knowledge,” “understand stress management concepts,” and [I was] “ordered to take this class.” Participants could select more than one option.
- iii. Workplace Stress Scale
Workplace stress was measured at pretest using the Workplace Stress Scale (Marlin Company and American Institute of Stress, 2001). Items such as “Conditions at work are unpleasant or sometimes even unsafe,” and “I feel that my job is negatively affecting my physical or emotional well-being,” were rated by participants on a scale from 1 (*never*) to 5 (*very often*). Positively worded items were reverse scored. Responses to the 8 items in the scale were averaged to create a composite workplace stress score; higher scores indicate higher levels of work stress ($\alpha = 0.84$)
- iv. Stress Management Strategies
Four items assessing specific stress management strategies were developed by the study investigators based upon the stress management skills covered in the Stress Management course curriculum. These behaviors were measured in the pretest assessment only. Sample stress management behavior items included, “How often do you engage in physical activity as a strategy to manage your stress?” and “How often do you look for positives around a stressful situation?” Response options were provided on a five-point scale from 1 (*never*) to 5 (*all of the time*).

Responses to the 4 stress management behavior items were averaged to create a composite score, where higher scores indicate higher use of accepted stress management strategies. This measure demonstrated adequate internal consistency ($\alpha = 0.59$).

v. Stress Management Knowledge

Stress management knowledge items were developed by the study investigators based upon the core content of the Stress Management course curriculum. The same five knowledge questions were included in the pretest and posttest assessments, and asked participants to identify examples of internal and external stressors, consequences of unmanaged stress, and examples of stress management strategies. An overall knowledge score was calculated as the number of correctly answered knowledge items.

vi. Intention to use and share information from the course

At posttest, a single item developed by the investigators asked participants if they intended to share something they learned in the stress management class with another person with “yes” or “no” response options. Next, participants indicated the person(s) with whom they intend to share this information. Options included: spouse, family, civilian friends, military friends, unit members, leadership and neighbors. Another single item developed by investigators for this study asked participants if they planned to use anything learned from the stress management class in the future (“yes” or “no”).

vii. Global Course Evaluation Scale

An aggregate Global Course Evaluation (GCE) score was created for the purpose of this study. The GCE measure included a course satisfaction subscale, a relevance subscale, and a course attributes subscale, all of which were rated on 5-point scales, with higher scores indicating a more positive evaluation of the course (see Appendix A; overall measure $\alpha = 0.93$). For multi-item subscales, item responses were averaged to compute a total scale score.

- a. Course Satisfaction subscale: A single posttest item asked participants about their satisfaction with the course. Response options ranged from 1 (*strongly disagree*) to 5 (*strongly agree*).
- b. Relevance subscale ($\alpha = 0.81$): Three items assessed perceived relevance of the course to the participant’s personal and work life. The first two items included, “This class is relevant to maintaining my operational readiness” and, “This class met my personal needs.” Response options ranged from 1 (*strongly disagree*) to 5 (*strongly agree*). The third item asked, “How personally relevant to you was

this class?" with response options ranging from 1 (*not relevant*) to 5 (*extremely relevant*).

- c. Course Attributes subscale: Seven items assessed participants' general perceptions of the value of the course. For example, participants were asked to indicate the degree to which the course was helpful, interesting, and encouraged strategies to handle stress. Response options were provided on a five-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Instructor effectiveness and the propensity to recommend this course to others were also included in the participant ratings subscale ($\alpha = 0.91$).

f. Analytic strategy

Descriptive statistics were generated for all survey measures. Bivariate correlations were calculated among the study variables. A paired sample t-test was conducted to determine if stress management knowledge changed from pretest to posttest.

III. RESULTS

a. Participation

A total of 120 Sailors consented to participate in the study and completed the pretest assessment. Twenty-five of these participants had to leave the class before it ended due to work responsibilities, and therefore did not participate in the posttest assessment. The remaining 95 participants who completed both pretest and posttest assessments were included in the final sample. Of these 95 participants, 28% failed a single-item attention check nested within the posttest assessment; however, on most study variables, no substantive differences emerged between participants who did versus did not pass the attention check. There were two exceptions: first, men (92%) were more likely than women (8%) to fail the attention check, ($X^2(1) = 5.45, p = 0.02$); second, those who failed attention checks had lower knowledge scores at pretest ($M = 3.04, SD = 1.29$) than those who passed the attention check ($M = 3.85, SD = 1.14$), ($t(93) = -3.04, p = 0.003$).

b. Sample characteristics

The majority of participants were White (58.9%), male (73.1%), and enlisted (95.3%); they were 26 years old, on average ($SD = 6.67$). Approximately half of participants were high school educated (48.4%), and the remainder had completed some college or had a college degree or higher (50.5%). The majority of participants were single (60%), and most did not have children (72.6%). Most participants had been at their current duty station for 12 months or more (63.8%). Most participants had never been deployed, or only had one deployment in their careers (77.9%). See Table 1 for sample sociodemographic and military characteristics.

Table 1. Sociodemographic and military characteristics of FFSC Stress Management class attendees.

Variables	<i>N</i> ^b	% or M (SD)
<i>Sociodemographic Characteristics</i>		
Age, years	93	25.73 (6.67)
Gender		
Male	68	73.1
Female	23	24.7
Race/Ethnicity ^a		
White or European	56	58.9
Hispanic or Latino	22	23.2
Black or African American	17	17.9
Asian or Asian American	11	11.6
Other	10	10.5
Marital status		
Single	57	60.0
Married	38	40.0
Number of children		
0	69	72.6
1 or more	25	26.6
Education		
High school diploma	46	48.4
Greater than a high school degree (some college, Associates degree, Bachelor's degree, or Graduate degree)	47	50.5
Pay grade/rank		
E1–E3	22	25.6
E4–E6	60	69.8
E7–E9 and Officers	12	13.6
<i>Military Characteristics</i>		
Year joined the military		

1995-2006	10	11.4
2009-2014	19	21.6
2015-2019	59	67.0
Length at current duty station		
1 month or less	7	7.4
2-11 months	27	28.7
12-24 months	32	33.7
Over 24 months	28	29.5
Number of deployments		
0	42	44.2
1	32	33.7
2 or more	21	22.0

^a Participants could select all that apply.

^b The total number of responses across items varies due to missing data.

c. Descriptive statistics and associations

Participants' most commonly endorsed reason for taking the stress management course was to acquire new knowledge (Figure 1). The next most commonly endorsed reason was to better understand the concepts of stress management.

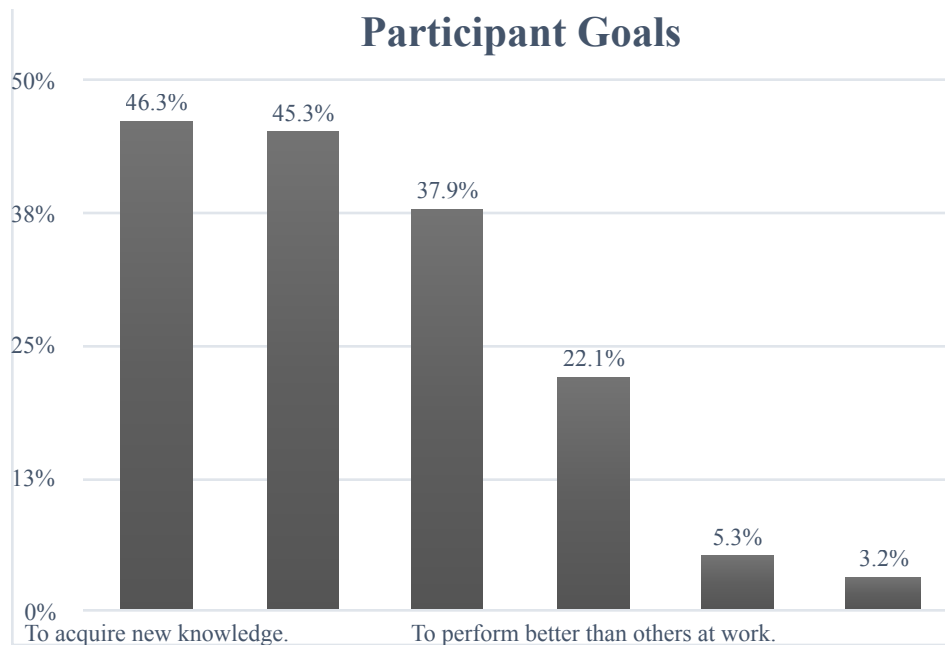


Figure 1. Participant reasons for taking the FFSC Stress Management class ($N=95$). *Note.* Participants could select all that apply.

Overall, self-rated levels of workplace stress at pretest were moderate ($M = 3.33$, $SD = 0.76$). The mean frequency with which participants engaged in the stress management behaviors listed at pretest was moderate at 3.08 ($SD = 0.71$). The most frequently used stress management strategy that participants reported was looking for positives around a stressful situation ($M = 3.39$, $SD = 1.11$), followed by engaging in physical activity ($M = 3.15$, $SD = 1.21$), eating healthier ($M = 2.73$, $SD = 1.04$), and engaging in spiritual behaviors to manage stress ($M = 2.45$, $SD = 1.15$).

Table 2 contains bivariate correlations among study variables. Age was associated with greater self-reported use of stress management behaviors, and lower ratings on the GCE relevance subscale. Use of stress management strategies was associated with higher GCE ratings. Greater work stress was associated with less frequent use of stress management strategies, lower GCE ratings, lower ratings of course relevance, lower ratings of other aspects of the course, and lower intent to use strategies or share strategies with others. As anticipated, GCE scores were positively associated the three constituent subscales and intent to use and share stress management strategies, and all three subscales and intent to use and share stress management strategies were positively intercorrelated as well.

Table 2. Correlations (Pearson's r) among study variables at baseline

	1	2	3	4	5	6	7	8	9	10	11	12
1. Age	1											
2. Gender ^a	0.04	1										
3. Marital Status ^b	0.15	-0.13	1									
4. Education	0.17	0.28**	-0.07	1								
5. Stress Management Strategies	0.27**	-0.13	-0.01	0.01	1							
6. Workplace Stress Scale	0.05	0.30**	0.05	0.06	-0.27**	1						
7. Global Course Evaluation Scale	-0.17	0.06	0.05	-0.01	0.21*	-0.39***	1					
8. Relevance subscale	-0.23*	0.06	0.08	0.07	0.15	-0.39***	0.92***	1				
9. Course Satisfaction subscale	-0.04	0.13	0.01	0.13	0.16	-0.19	0.67***	0.55***	1			
10. Participant Rating subscale	-0.14	0.05	0.04	-0.07	0.23*	-0.38***	0.98***	0.82***	0.62***	1		
11. Intent to share Stress Management Strategies	-0.06	-0.05	0.09	0.10	0.17	-0.28**	0.55***	0.51***	0.38***	0.54***	1	
12. Intent to Use Stress Management Strategies	-0.15	-0.02	0.07	-0.04	0.19	-0.26*	0.60***	0.60***	0.43***	0.56***	0.57***	1

^a Gender coded as follows: 1 = male, 2 = female

^b Marital status coded as follows: 1 = single, 2 = married

* $p < .05$, ** $p < .01$, *** $p < .001$

d. Key evaluation outcomes

RQ1: *What are the short-term effects of the stress management training on Sailors' stress management-related knowledge?* A paired sample t-test was conducted to examine changes in knowledge as a result of completing the Stress Management course. The pretest and posttest stress management knowledge scores ($M = 3.62$, $SD = 1.23$, and $M = 3.73$, $SD = 1.16$, respectively) were not significantly different ($t(94) = -1.02.1$, $p = 0.31$, Table 3).

RQ2: *What are the short-term effects of the stress management training on Sailors' intention to share course information with others?* Most participants (80%) indicated at the posttest assessment that they planned on sharing information learned during the course with someone else (Table 3). Participants most frequently indicated an intention to share information learned from the course with their spouse (41.1%), other family members (40%), and military friends (36.8%; Figure 2). In addition, 85.3% of participants intended to use information they learned in the course in the future (Table 3).

RQ3: *What is the level of participant satisfaction with the course content and course delivery?* Results showed that the GCE scores were relatively high ($M = 3.81$, $SD = 0.66$; Table 3). Within

the GCE, the three course evaluation subscales indicated that participants were satisfied with the course ($M = 4.05$, $SD = 0.63$), believed the course was generally relevant ($M = 3.64$, $SD = 0.81$), and had generally positive ratings of the course and instructor ($M = 3.84$, $SD = 0.67$).

Table 3. Key evaluation outcomes for FFSC Stress Management class participants ($N=95$).

Variables	M (SD) or % (n)
Stress Management Knowledge ^a	
Pretest	3.62 (1.23)
Posttest	3.73 (1.16)
Intention to share class information with others ^b (% yes)	80 (76)
Intention to use information learned in the course ^b (%yes)	85.3 (81)
GCE score ^{b,c}	3.81 (0.66)
Course satisfaction subscale	4.05 (0.63)
Relevance subscale	3.64 (0.81)
Participant ratings subscale	3.84 (0.67)

^a Mean number of correctly answered items of 5 knowledge items

^b Measured at posttest only

^c Overall and all subscale evaluation scores are based on 1 = *strongly disagree* to 5 = *strongly agree*

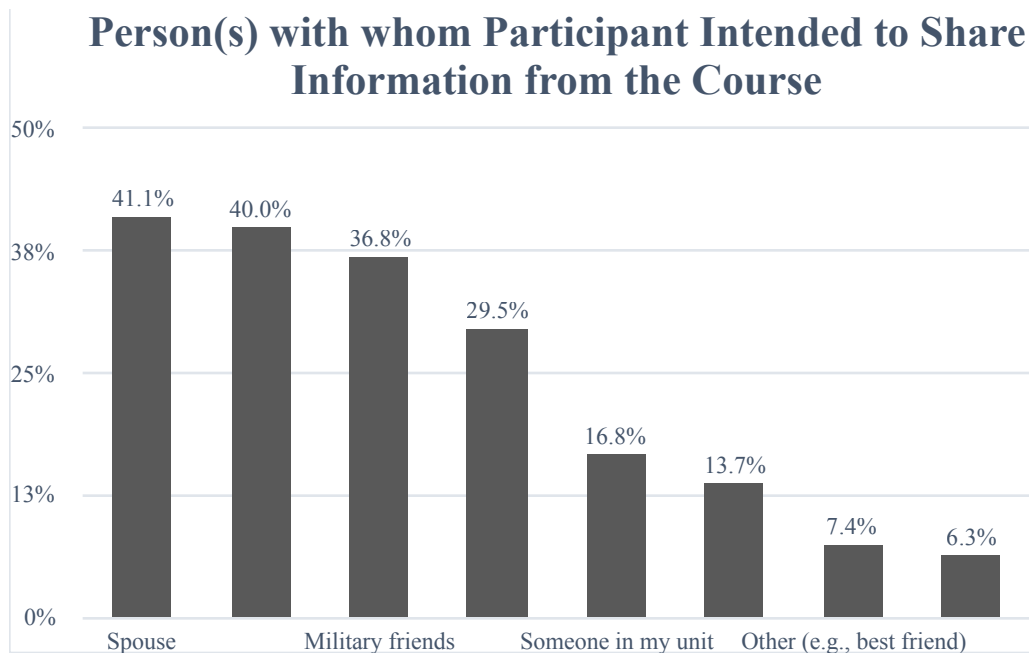


Figure 2. Intentions to share information learned during the FFSC Stress Management course with others ($N=81$).
Note. Participants could select all that apply.

e. Exploratory analyses

Exploratory analyses were conducted to examine potential differences in study variables between male and female training participants. Female service members reported significantly higher levels of work stress compared to male service members ($t(89) = -2.93, p = 0.004$). There were no other significant differences in any study variables between male and female participants.

IV. DISCUSSION

a. Overview of findings

This research effort evaluated the Stress Management training course offered by FFSC. Our evaluation included 6 administrations of this class which were offered aboard two Navy vessels over the course of two months. Pretest assessments showed that both workplace stress and use of specific stress management strategies were moderate in this sample. This suggests that most participants may have had an adequate grasp of stress management strategies prior to taking the stress management course. Nonetheless, they still reported experiencing moderate levels of stress.

In this study, gender differences in work stress were explored. Women reported higher levels of work stress than men, which parallels research findings in the civilian sector (American Psychological Association, 2012), and which may reflect related findings from military research showing that women in the military experience more discrimination relative to men (Morrall et al., 2015). Furthermore, women are underrepresented on ships compared to men (Moore, 2020), which may lead to additional gender-related stressors associated with shipboard life. Providing

additional stress management resources for women aboard ship or identifying and diluting shipboard stressors that disproportionately impact women may be warranted.

Stress management behaviors were linked with age, such that older participants reported utilizing stress management behaviors more frequently prior to receiving the class. In addition, course relevance was negatively linked with age, such that younger participants found the course to be more relevant. It may be that because older participants were already practicing more stress management behaviors, they were less likely to learn new information relevant to their work or personal lives in the course. This suggests that the course may be most likely to benefit more junior Sailors, and raises the possibility that it would be useful to augment course content or delivery methods to develop a more advanced stress reduction course for Sailors who are older and more experienced.

Paradoxically, Sailors reporting higher levels of work stress also reported utilizing fewer stress management strategies at baseline, yet they rated the course as less useful than did those who were experiencing less stress. Logically, Sailors with high levels of work stress have the most to gain from stress management training, and thus may be the most important target group for this training. However, it may be that personnel who are experiencing the highest stress – and thus are in greatest need for assistance with stress management – have more limited attentional and cognitive resources, and therefore have less ability to benefit from training. This suggests that stress reduction courses may be of greatest benefit if they are delivered prior to the development of stress (as a preventive measure), rather than after a service member has developed high levels of stress. Sailors who are already experiencing high stress levels may not be able to benefit from a course and may instead need professional support.

Our examination of the impact of the stress management course on stress management knowledge indicated that there was no short-term effect of the stress management training on Sailors' stress management-related knowledge (RQ1). However, this may be because the average participant entered the class already answering almost 4 of the 5 knowledge questions correctly. If incoming students already had some knowledge related to stress management, it may be that the course content needs to be adjusted to cover more advanced concepts. Alternatively, the questions asked may have simply been too easy, thus inducing a ceiling effect, with high scores as an artificial product of an exceedingly straightforward knowledge test (Garin, 2014).

Most participants intended to share information learned in the course with others, most commonly with spouses or romantic partners, family members other than their spouse, and military friends (RQ2). Sharing information learned in class with others may be a successful strategy for Sailors to obtain support from social networks to implement stress management skills. Furthermore, class participants who share stress management information with others may provide a cue to action for others, such as family members and fellow service members, to take stress management actions themselves, thus extending the reach of the class.

Participants reported high levels of overall satisfaction with the course, and found the course to

be relevant in meeting their personal and military readiness needs. Satisfaction with the class may have implications for improved stress outcomes, although the design used in the present study limited our ability to examine this effect.

b. Limitations

The primary limitation in this study was the high level of attrition (21%). Attrition during the presentation of the class aboard ship was a factor that the investigators did not have control over, and it likely did not impact the validity of study findings. Consistent with this, an analysis comparing participants who left the study prior to completing the posttest to participants who completed both the pretest and posttest showed no differences in demographic characteristics or in workplace stress. In terms of course implementation, the high level of attrition suggests that while the course was given at the direction of the ship's commanding officer, there may not have been a high level of prioritization or support by department-level leadership to allow attendance in the context of the needs of the ship and Sailors' bustling work schedules.

Another limitation of this study is its one-group, pretest/posttest design. Ideally, we would have been able to randomly assign participants to either the intervention or a control conditions; this was not feasible in this applied study. Further, due to the onset of the COVID-19 pandemic, our ability to collect additional data including longer-term follow-up data on ships was restricted. The stress knowledge measure was also limited in that it only contained five items based on the existing CNIC stress management course curriculum and was not a comprehensive stress knowledge assessment. It is important to note, however, that the research team had limited time in which to collect these data, necessitating that data collection materials be as brief as possible to fit within the allotted timeframe.

Lastly, observer effects may have affected the delivery of, or participant receptivity to, the training. Instructors were informed in advance when the researchers would be present, and the instructors introduced the research team to fully inform class participants about their purpose for attending. It has been shown that the mere presence of researchers in the classroom can affect instructor or learner behavior (Shadish et al., 2002), which could have influenced results of the present study.

c. Recommendations for future evaluations

This study investigated the immediate effects of receiving an FFSC stress management course on shipboard Sailors' stress management knowledge, intentions to share course information and satisfaction with the class. The evaluation was conducted with the support of the FFSC class instructors and the ships' leadership. While the evaluation indicated that the course did not increase knowledge of stress management techniques, it had other short-term benefits for participants, including the intention of the majority of them to share class information with others, and Sailors' generally high satisfaction with the class and instructors.

Considering the study results and observational evidence gathered from class observations, as

well as the scientific literature on best practices for health intervention evaluations, the following recommendations are presented to provide guidance for future evaluations of stress management or similar classes for service members.

i. Involve the community to tailor the evaluation approach and implementation.

We recommend that program implementers use a community-based participatory research (CBPR) approach to tailor their evaluation approach and enhance the success of implementation (Wallerstein & Duran, 2010). Our team met often with FFSC leadership and Life Skills Trainers to develop the evaluation framework materials, but we did not meet with Sailors themselves to discuss and modify our evaluation materials. Using a CBPR approach, researchers, program representatives and members of the community of service members would work together via meetings, focus groups, and/or interviews to identify the evaluation approach and training delivery methods (e.g., traditional methods, health information technology applications, incorporation of social media elements, demonstrations, other specific methods and activities) that have high acceptance by the target audience and are perceived to be the most directly engaging, relevant, and beneficial. Results of the current study showed that older (vs. younger) Sailors and those with higher (vs. lower) work stress rated the course as less relevant to their personal and work life. Partnering with members of these subgroups of the target population would likely help program implementers to tailor their evaluation and implementation methods to meet the specific needs of these groups, which may increase the perceived relevance of the class to them.

ii. Involve stakeholders in evaluation design.

Program evaluators must work closely and communicate regularly with program directors and implementers, and other stakeholders, from the beginning of the evaluation effort. Our team did make this a priority before and during the evaluation effort. Evaluation staff in the present study continuously and consistently integrated FFSC leadership feedback on study materials and design, and provided reports on ongoing findings as the evaluation progressed. Evidence from other program evaluations suggests that evaluators engaged in strong communication with program stakeholders at the start of an evaluation gain greater stakeholder satisfaction and support in conducting the evaluation (Cartland et al., 2008). For example, when program evaluators involve stakeholders in decisions regarding the evaluation design and share tasks supporting the evaluation, stakeholders are more likely to understand the usefulness and salience of the evaluation. Furthermore, in line with trends in evaluation practice and theory (Mark, 2001), involving stakeholders in the overall evaluation design approach, as well as specific aspects, including the development of data collection materials and facilitating recruitment efforts, can also increase stakeholder confidence in the evaluation effort. A collaborative, team approach with stakeholder support of a program evaluation may be especially critical for

military program research as access to military populations is particularly challenging.

iii. Develop evaluation tools.

Program implementers should develop and use evaluation tools to continuously evaluate their programs for effectiveness. Many programs, including the FFSC, collect feedback from training participants; however, participant feedback evaluations can be strengthened by: a) creating a brief feedback form with valid and reliable evaluation items; and b) implementing a routine process by which the forms are consistently administered to all class attendees and collected in a way that maintains participant anonymity. Ongoing program evaluation allows organizations to monitor and respond to the evolving needs of the fleet by making relevant programmatic or process-oriented changes in program delivery (Center for Community Health and Development, 2020). Internal program evaluation data can also be used to supplement a formal program effectiveness evaluation. In addition, follow-up evaluations should be conducted to allow for longer-term assessment of the program's impact. Similarly, structured feedback from command leadership should be routinely collected as part of the evaluation process. Resources for internal program evaluation are often scarce, yet program evaluation results are often required for justifying ongoing program support and demonstrating accountability. As such, it is critical that valid evaluation tools are developed and routinely used to evaluate programs.

iv. Enhance standardization of course content.

In order to increase the validity of a program effectiveness evaluation, the implementation of the class or program across various settings should be standardized and the class material should be presented as intended. Anecdotal evidence from the limited number of class observations in the present study indicated that there was wide variability in class duration and wide variability in class content and activities. Real world conditions in military settings often necessitate flexibility in program implementation to accommodate practical considerations and changing service member needs. However, adherence to the core course material across settings is important for evaluation and the ability to draw conclusions about the program's effectiveness (Carroll et al., 2007). Well-trained course instructors who have experience with the course material and the target population of service members should be able to advise on the essential course elements and about ways to deliver the core material in a flexible way that honors program integrity even when variations in course delivery cannot be avoided.

V. CONCLUSIONS

This study was the first evaluation of the short-term impact of an FFSC Stress Management class offered to shipboard crews. This study found that stress management class participants intended

to share information learned in the class with family members and military friends, potentially extending the reach and impact of the course material. In addition, participants provided a relatively high overall course evaluation, and agreed that they were satisfied with the course, believed the course was generally relevant, and had generally positive ratings of the course and instructor. The evaluation did not, however, provide evidence of increased stress management knowledge as a result of the training. As discussed above, this could be due to generally high scores in stress management even prior to taking the course, indicating either that the knowledge questions were too easy or that the course content itself needs to become more advanced in order to build on knowledge about stress management that many Sailors already possess.

Interestingly, those reporting higher levels of work stress at the beginning of the class were least likely to perceive the class as helpful or relevant. Although beyond the scope of the current evaluation, it may be that stress reduction courses will be most effective when provided prior to, rather than after, students have developed high levels of stress. This may also fit with the finding that younger participants generally found the course more beneficial. Younger Sailors may have less knowledge about stress reduction and/or less stress than their older or counterparts.

While study limitations prevented us from assessing the long-term impact of the stress management course on stress and behavior, the results suggest some positive short-term effects, including the intention to use information learned during the class and to share class information with others.

The study results represent a first step in evaluating the impact of FFSC stress management courses. Additional research is needed to assess change in stress management behaviors among class participants, compared to a control group, over time. In addition, considering the study results and subjective class observations, as well as drawing from the scientific literature on evidence-based best practices for health intervention evaluations, we recommend that future program evaluations of interpersonal and health promotion classes for military service members follow these guidelines: i) involve the community to tailor the evaluation approach and to enhance training methods and relevance by using a community-based participatory approach; ii) involve stakeholders in designing the evaluation; iii) develop evaluation tools for routine use in internal program evaluations; and iv) strive to enhance standardization of course content across implementation settings. Further evaluations of the effects of stress management classes (and other similar types of classes) on Sailors' health and readiness should be undertaken. This type of research is critical to ensure that the resources designed for Sailors are producing the intended benefits.

VI. REFERENCES

- American Psychological Association. (2012). Stress by gender: 2012. <http://www.apa.org/news/press/releases/stress/2012/gender>
- Carroll, C., Patterson, M., Wood, S., Booth, A., Rick, J. & Balain, S. (2007). A conceptual framework for implementation fidelity. *Implementation Science*, 2, 40. <https://doi.org/10.1186/1748-5908-2-40>
- Commander, Navy Installations Command (CNIC). (n.d.). *About Us*. https://www.cnic.navy.mil/ffr/family_readiness/fleet_and_family_support_program/about_us.html
- Commander, Navy Installations Command (CNIC). (n.d.). *Life Skills*. https://www.cnic.navy.mil/ffr/family_readiness/fleet_and_family_support_program/work-and-family-life/life-skills.html
- Center for Community Health and Development, University of Kansas. (2020). Chapter 40, Maintaining Quality Performance, Section 3. Obtaining and Using Feedback from Participants, Main Section, Community Tool Box. [online] Available at: <https://ctb.ku.edu/en/table-of-contents/maintain/maintain-quality-performance/feedback-from-clients/main> [Accessed 9 September 2020].
- Day, A. J., Brasher, K., Bridger, R. S. (2012). Accident proneness revisited: The role of psychological stress and cognitive failure. *Accident Analysis & Prevention*, 49, 532-535. <https://doi.org/10.1016/j.aap.2012.03.028>
- Ellis, A. (1973). *Humanistic psychotherapy: The rational-emotive approach*. Three Rivers Press.
- Ellis, A. (2001). *Feeling better, getting better, staying better: Profound self-help therapy for your emotions*. Impact Publishers.
- Garin, O. (2014). Ceiling Effect. In: Michalos A.C. (eds) *Encyclopedia of Quality of Life and Well-Being Research*. (pp. 631-633). Springer. https://doi.org/10.1007/978-94-007-0753-5_296
- Mark M. M. (2001). Evaluation's future: furor, futile, or fertile? *American Journal of Evaluation*, 22(3): 457-79. <https://doi.org/10.1177/109821400102200324>
- Marlin Company and the American Institute of Stress. (2001). *The Workplace Stress Scale*. Marlin Company and the American Institute of Stress.
- McCleron, C. K., McCauley, M. E., O'Conner, P. E., Warm, J. S. (2011). Stress training improves performance during a stressful flight. *Human Factors: The Journal of the Human Factors and Ergonomics Society*, 53(3), 207-218. <https://doi.org/10.1177/0018720811405317>
- Millegan, J., Delaney, E., Klam, W. (2016). Responding to trauma at sea: A case study in psychological first aid, unique occupational stressors, and resilience self-care. *Military Medicine*, 181, 11-12. <https://doi.org/10.7205/MILMED-D-16-00004>

- Miranda, A. T., (2018). Understanding human error in Naval aviation mishaps. *Human Factors: The Journal of the Human Factors and Ergonomics Society*, 60(6), 763-777. <https://doi.org/10.1177/0018720818771904>
- Moore, B. L. (2020). Military Women: Changes in Representation and Experiences. *Handbook of Military Sciences*, 1-22.
- Morrall, A. R., Gore, K. L., & Schell, T. L. (2015). *Sexual assault and sexual harassment in the US military. Volume 2. Estimates for department of defense service members from the 2014 RAND military workplace study*. RAND National Defense Research Institute; Santa Monica, CA. Retrieved from <https://apps.dtic.mil/sti/pdfs/ADA616051.pdf>
- Norton, K. J. (2014). *The Naval Safety Center and Naval Safety Culture* [PowerPoint slides]. Retrieved from https://ehss.energy.gov/deprep/archive/Documents/PM140827_Presentation_Norton.pdf
- O'Connor, P. (2011). Assessing the effectiveness of bridge resources management training. *The International Journal of Aviation Psychology*, 21(4), 357-347. <https://doi.org/10.1080/10508414.2011.606755>
- Oltean, H., Hyland, P., Vallières, F., & David, D. (2017). An Empirical Assessment of REBT Models of Psychopathology and Psychological Health in the Prediction of Anxiety and Depression Symptoms. *Behavioural and Cognitive Psychotherapy*, 45(6), 600-615. <https://doi.org/10.1017/S1352465817000133>
- San Diego Military Family Collaborative (n.d.). *Fleet and Family Support Center San Diego*. <https://sdmilitaryfamily.org/resource-connection/fleet-and-family-support-center-san-diego/>
- San Diego Navy Life Southwest. (n.d.). *Fleet & Family Support Center (Metro San Diego)*. <https://sandiego.navylifesw.com/programs/14b94e26-cff0-447d-8381-edca6572aa74>
- Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. Belmont, CA: Wadsworth Cengage Learning.
- United States Fleet Forces Command. (2017). *Comprehensive Review of Recent Surface Force Incidents*. Norfolk, VA.
- Wallerstein, N. & Duran, B. (2010). Community-Based Participatory Research Contributions to Intervention Research: The Intersection of Science and Practice to Improve Health Equity. *American Journal of Public Health*, 100, S40-S46. <https://doi.org/10.2105/AJPH.2009.184036>

VIII. APPENDIX

a. Global Course Evaluation Measure

Course Satisfaction subscale

I am satisfied with the class overall.^a

Relevance subscale

This class is relevant to maintaining my operational readiness.^a

This class met my personal needs.^a

How personally relevant to you was this class?^b

Participant Ratings subscale

How helpful did you find the stress management course to be?^c

How interesting did you find the stress management course to be?^d

I would recommend this class to others.^a

I learned new information from the class.^a

The instructors leading this class were effective.^a

This class encouraged me to use specific strategies to manage stress.^a

This class motivated me to learn more about how to handle my stress.^a

^a Response options were provided on a five-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*).

^b Response options were provided on a five-point scale from 1 (*not relevant*) to 5 (*extremely relevant*).

^c Response options were provided on a five-point scale from 1 (*not helpful*) to 5 (*extremely helpful*).

^d Response options were provided on a five-point scale from 1 (*not interesting*) to 5 (*extremely interesting*).

REPORT DOCUMENTATION PAGE

*Form Approved
OMB No. 0704-0188*

The public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.

1. REPORT DATE (DD-MM-YYYY)		2. REPORT TYPE		3. DATES COVERED (From - To)	
4. TITLE AND SUBTITLE				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			19b. TELEPHONE NUMBER (Include area code)