Oregon Military Employee Sleep & Health Study

SUMMARY OF FINDINGS
for
ORNG SERVICE MEMBER
& SPOUSE PARTICIPANTS

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NOTE TO PARTICIPANTS

Our research team would like to express our sincerest and deepest gratitude to the ORNG service members and spouses who participated in this study and to the ORNG leadership for their continual support of the Military Employee Sleep & Health (MESH) Study. Our recruitment and participation rates exceeded our expectations – even when we were able to collect data during the COVID-19 pandemic in November 2020, more than half of the original participants responded. For many this was over a year after their last survey, so we are especially grateful.

When our team first came to your units to recruit for the study, we promised to share the results when we were done; hence this report. It contains a very brief summary of our findings, focusing especially on the effects of the supervisor training and sleep feedback intervention, but also provides a snapshot of what sleep looks like in the ORNG and comparing Army and Air units. We are also including information from the spouse/partner survey data. Some of the most exciting findings are revealed when we looked at the couple as a unit (see page 16).

Our hope is that you will find this report informative and the contents may inspire you to review your current sleep habits and maybe make some improvements. If you are a leader, either with the ORNG or elsewhere, you can go through the updated **Family and Sleep Supportive Training for Leaders (FaSSTL)** through our website and/or share the training with others. We also provide a way to **do your own sleep study** to review your current sleep habits. The world looks very different from when we conducted the study from 2017-2020, almost all pre-COVID-19, so it makes sense to review your current sleep habits now.

When we say that this study could not have been successfully completed without you, we are not exaggerating. Your generosity in terms of time and information have been invaluable. Our teams here at OHSU and PSU are hopeful to continue our successful collaboration with the ORNG that we first started back in 2008.

With Gratitude,

Leslie Hammer

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Executive Summary

Study Purpose

- **The primary goal of the Military Employee Sleep and Health Study (MESH) was to test the effectiveness of a sleep leadership supervisor training combined with sleep feedback and goal setting for service members.** Sleep is essential and impacts chronic health conditions and performance at work, so we expected that improvements in sleep would correspond with improvements in health, well-being, readiness and performance more generally.

What we Did

- Collected survey and activity/sleep data from **919** service members in the Oregon National Guard and survey data from **365** spouses and partners.

- Administered the online Family and Sleep Supportive Leadership Training (FaSSTL) to **154** ORNG supervisors and gave individual Sleep Health Feedback to **398** participating Service Members

What we Found: Positive Impacts

On Service Members:
- Longer sleep duration, better sleep quality, reduced anger, increased resilience, increased job satisfaction, improved functional performance

On Both Service Members and their Partners:
- Reduced loneliness and increased life satisfaction for participants and their spouses, increased satisfaction with partner

On Supervisors:
- Improvements in sleep leadership education and COVID-19 leadership behaviors, reductions in sleep-related impairment and insomnia symptoms
- Leader scores jumped from 71.2% before taking the training to 86.1%, showing a high degree of learning. Leaders also rated the training favorably, with 83.6% recommending to co-workers.

Next Steps

- An updated version of the FaSSTL training is available on our website: www.supportiveworkplaces.org

- We have also created a civilian version that can be accessed on our website, **Supportive Workplaces**, along with other trainings focusing on various types of leader support: www.supportiveworkplaces.org

Introduction

The Oregon Military Employee Sleep & Health Study (MESH) was a Department of Defense funded research project aimed to improve safety, health, and well-being of *full-time* service members (including Military Technicians and Active Guard Reserves) in the Oregon National Guard (Army and Air) and their families, funded from SEP 2016 to SEP 2021.

The primary goal of the MESH study was to test the effectiveness of our **Family and Sleep Supportive Training for Leaders** (FaSSTL) combined with **sleep feedback and goal setting** on service members' sleep, well-being, and psychological health – as well as their families' health and well-being. We designed the training to aid supervisors to be more supportive of their employees' sleep health and work-life balance. Additionally, the sleep feedback and goal setting informed service members of their sleep patterns and had them set goals to improve their sleep. This study was focused on improving supervisor support and sleep health because research has shown both to be related to physical and psychological health and well-being.

The Intervention was expected to have a positive effect on mental health, in terms of reduced stress and psychological distress and increased social support. Longer term, these effects are anticipated to last, creating an overall more supportive organizational environment, which has many positive impacts on health, well-being, family processes, and organizational outcomes.

The MESH Study featured three primary components:

1. FAMILY AND SLEEP SUPPORTIVE TRAINING FOR LEADERS (FaSSTL): Supervisors completed interactive, online training, focused on improving their family- and sleep-supportive behaviors. They followed up the training by tracking their supportive behaviors for two weeks.

2. INDIVIDUAL SLEEP FEEDBACK: Service members wore sleep-tracking watches at two time points, nine months apart. After wearing the watch for three weeks, they met with trained MESH staff to discuss their sleep results and receive guidance in setting two behavioral goals to improve their sleep.

3. SURVEYS TO EVALUATE THE TRAINING & FEEDBACK EFFECTIVENESS: Service members, supervisors and their spouses/partners completed three rounds of surveys (baseline, 4-month, 9-month), plus an additional follow-up survey during the COVID-19 pandemic. These surveys were designed to measure the effect of the intervention on service members' sleep, health, and well-being. Spouses and partners of service members were also invited to complete the surveys as our families have a significant impact on our own sleep, health, and well-being. We also collected an additional round of survey data during the COVID-19 pandemic (November, 2020).

MESH Study Design Overview

We wanted to provide a quick refresher on the study design to provide some context for the results. The MESH Study was a randomized controlled trial, which means that different units were randomly assigned to either the intervention or control group. This is similar to a drug trial where one group receives the medication being tested and the other group either receives nothing or a placebo. For MESH, those units assigned to the intervention group received the sleep leadership training and the sleep feedback. Those in the control group received the training and feedback only at the <u>end</u> of the (pre-COVID-19) study phase. In this way, we can test for differences between the groups and feel more certain that any differences are because of the intervention and not some other factor.

The study diagram below depicts the rollout of the study, when we collected data, how and from whom, as well as when the intervention occurred.

MESH Study Design
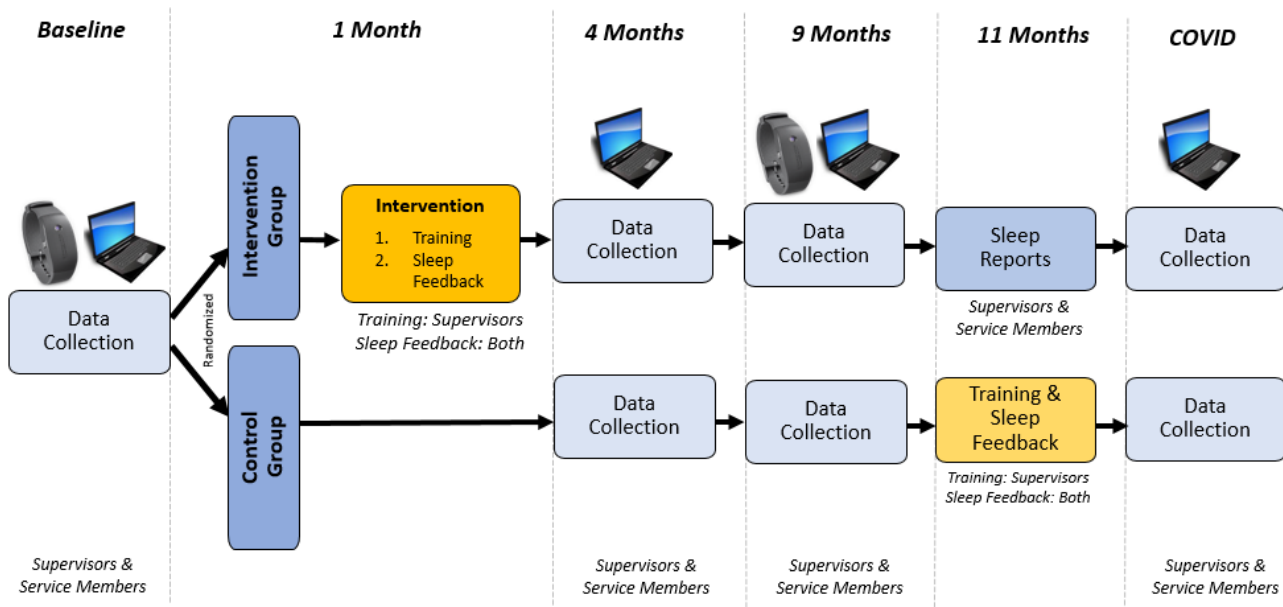
Please note that the diagram does not include the survey data collection for spouses/partners, which occurred at the same time as the service member surveys; spouses did not, however, wear the sleep tracking devices.

MESH Study Participants

Survey Response Rates

A total of **919 employees and supervisors, and 365 spouse/partners** completed the baseline survey, with about **80%** completing follow-up surveys. About 50% of the original participants also completed the supplemental survey conducted during the COVID-19 pandemic in NOV 2020, even though this would have been over a year later for some individuals. The table below provides additional details.

Branch	Baseline	4 months	9 months	COVID-19 (Nov 2020)
Service Members				
Army	417	362 (86.8%)	342 (82.0%)	201 (48.2%)
Air	502	405 (80.7%)	381 (75.9%)	266 (53.0%)
TOTAL	**919**	**766** 83.4%	**723** 78.7%	**467** 50.8%
Spouses/Partners				
Army	184	145 (78.8%)	139 (75.5%)	109 (59.2%)
Air	181	144 (79.6%)	141 (77.9%)	106 (58.6%)
TOTAL	**365**	**289** 79.2%	**280** 76.7%	**215** 58.9%

*In a relationship 6 or more months

Who Participated in the Surveys?

ORNG SERVICE MEMBERS - CHARACTERISTICS

Our survey sample came from all over the State of Oregon, concentrated primarily in the Salem and Portland metro areas, with another large portion of the ORANG at Kingsley Field in Klamath Falls. The boxes below show the different personal, family and work characteristics of the full-time ORNG service members who comprised our sample.

Personal Characteristics

- 75.6% Male, 24.2% Female
- 82% White, 8% Latinx, 4.7% checked more than 1
- Average age 37.4 (range - 19-69)
- 49.5% had some type of college degree

Family

- 79.1% married or in committed relationship
- Of those married, average length 11.2 years
- 73.4% have kids at home, 7.5% with a disability or illness (pre-COVID)
- 4.5% caring for elderly dependents

Work/Military

- 36.8% Military Technicians, 52.8% Active Guard/Reserve
- 82% Dual Status with ORNG
- Average tenure:
    - 12 years with ORNG, 15.1 with Military
- 82.7% Enlisted, 12.8% Officer
- 63.9% Deployed at some point since 9/11, foreign or domestic

SPOUSES AND PARTNERS - CHARACTERISTICS

Personal Characteristics

- 86% Female, 14% Male
- 83.4% White, 7.9% Latinx, 4.5% checked more than 1 race ethnicity
- Average age 36 (range - 19-69)
- 46.5% had some type of college degree

Family

- 91% were married, 8% cohabitating, and 1% in a committed relationship
- Average length of relationship was 12 years, but ranged from 6 months (minimum to participate in study) to 40 years
- 80.4% have kids, 9.9% with a disability or illness (pre-COVID)
- 6.1% reported caring for elderly dependents 3+ hours/week

Work

- 50.5% worked full-time, 20.8% part-time, 6.1% students, and about 17% were not currently working outside the home
- Of those working full time, they work an average of 41.5 hours/week and have been at their job for an average of 6 years, with a range of less than a year to 30 years
- 80% work day shift, 30% have a variable schedule and 5% work evenings or nights

Baseline Findings: Sleep in the ORNG

Using sleep tracking watches to measure sleep health

As noted previously, MESH Study service member participants wore sleep tracking watches for *three weeks* at the beginning of the study when completing the first survey. If you recall, actigraphy devices measure your movement and then use this information to calculate when you are asleep or awake.

Overall, we want to look at QUANTITY of sleep as well as QUALITY. The table below summarizes these two dimensions of sleep for the ORNG overall and breaks them down by branch.

Note that spouses/partners did not participate in this portion so we do not have results for them.

Summary of Baseline Sleep Tracker Data for the ORNG by branch

	Army (n = 396)	Air (n = 489)	ORNG (n = 885)
SLEEP QUANTITY			
Average sleep duration (hours)	7:25	7:14	**7:20**
% below recommended 7-9 hrs/night*	31%	35%	**33%**
SLEEP QUALITY			
Time Awake During Sleep (minutes)	41	42	**41**

*Source: National Sleep Foundation

Sleep Quantity

The average number of hours of sleep per night using the sleep tracking devices was 7 hours and 20 minutes. On the survey, the average amount of time was a little higher, about 7 hours and 40 minutes. It is very typical to see self-report sleep higher than what is measured by more objective means. This is right at the national average, as well as average for Oregonians. Note that about a third of people were below the recommended amount of sleep, putting them at greater risk for chronic disease, safety issues, and decreased mental health. Those in the ORANG reported slightly less sleep than the ORARNG, which is a statistically significant and a meaningful difference.

Sleep Quality

One measure of sleep quality is to look at the number of minutes people are awake after they initially fall asleep. This should be less than 10% of the total time spent asleep for healthy sleep. So for someone sleeping a full 8 hours (480 minutes), the number of minutes awake should be less than 48 minutes total. The average number of minutes for participants was 41 minutes and did not differ by branch. This is within the recommended range for the amount of time slept, 7 hours and 20 minutes,

though there was a lot of variation in the group, from an average of just a few hours a night to 10 or more hours/night.

Overall, the sleep health of the ORNG was adequate. However, as noted above, <u>a significant proportion of the sample was not getting the recommended amount of sleep</u>. In the next section, we break down the sleep tracker data and look more at percent of service members experiencing unhealthy sleep.
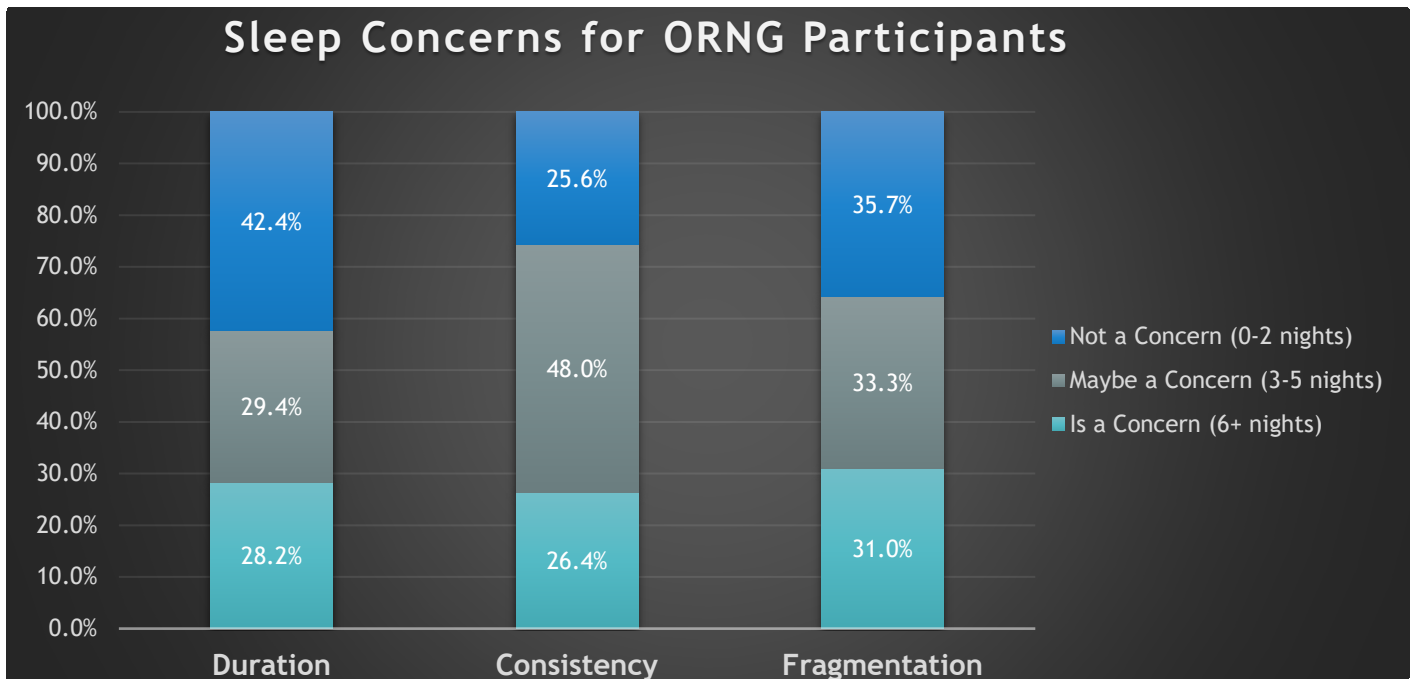
The Three Major Components of Sleep

As we note above, sleep experts recommend looking at how *well* you sleep (quality), not just *how much* (quantity). We took the data collected by the actigraphy devices and developed standards for the following areas: ***duration, consistency, and fragmentation***. Definitions of each are below, as well as links to more information

SLEEP COMPONENT	HOW WE DEFINED
DURATION Sleep experts recommend 7-9 hours of sleep each night. Go through and count the number of nights where you have less than 6 hours of sleep. If more than 20% of your sleeping periods recorded are less than 6 hours, you might have an issue with insufficient sleep.	*# of nights with less than 6 hours of sleep.*
CONSISTENCY Ideally, you should have similar bedtimes and wake times each day. Sleep experts recommend trying to consistently stay within at least a ***two-hour window*** of going to bed and waking up each day, even on weekends. More than that and your body can experience what scientists call *social jet-lag*, which could impair your thinking and functioning.	*# of nights when the sleep or wake time deviated more than two hours from the previous day*
FRAGMENTATION Everyone moves around a bit at night, but if you know you are waking up repeatedly then you may be experiencing sleep fragmentation. If you feel like you sleep through the night but do not feel well rested, these frequent breaks in sleep might give you a clue as to the cause. The number of minutes awake is part of this dimension.	*# of nights when there was notable activity/movement*

The chart below depicts the results of these three dimensions of sleep for the ORNG as a whole. Each component of sleep was assessed as *a concern* if problems were detected for 6+ days during the 3-week monitoring period, *maybe a concern* if detected 3-5 nights, or *not a concern* if detected 2 or less nights.

Summary of Sleep Concerns for ORNG Members

Sleep Concerns for ORNG Participants

Dimension	Is a Concern (6+ nights)	Maybe a Concern (3-5 nights)	Not a Concern (0-2 nights)
Duration	28.2%	29.4%	42.4%
Consistency	26.4%	48.0%	25.6%
Fragmentation	31.0%	33.3%	35.7%

DURATION:

Overall, we see that of the 3 dimensions, sleep quantity (i.e., duration) was less of a concern for most participants. However, almost a third of the sample had 6 or more nights over the 3-week-period where they got *less than 6 hours* of sleep.

CONSISTENCY:

For consistency, almost half of service members fell in the "maybe a concern" section where this may be an issue (i.e., 3-5 nights where there was a shift of more than 2 hours for either bed or wake time). Often this was during the weekends, where people would stay up much later and sleep in later, a phenomenon known as *social jet lag*. This is similar to forcing your body to adapt to being in a different time zone each weekend, which can take a toll on your health over time. It is recommended to keep within a 2-hour window of your usual bed or wake time.

FRAGMENTATION:

Interrupted sleep had the highest number of people for whom this was a concern (6 or more nights over the 3 week period where a wake episode was noted). A number of factors can influence your wakefulness at night; if this is an issue for you, look first at your environment and make sure it is conducive to sleep and reduce screen time before bed. If this does not help, talk to your primary care provider about medical issues which may be causing you to wake at night. Sleep apnea *could* be a factor; see your doctor to get tested.

Sleep Goals

At the end of the sleep feedback session, we asked participants to set **two goals** based on what they learned about their sleep that would improve their sleep. Our team reviewed and grouped the goals into categories. Below are the Top 5 Sleep Goals participants set.

Top 5 Sleep Goals

1. **Refrain from using technology (smartphones, laptop, TV) near bedtime.**

2. **Adjust bedroom environment to be conducive to sleep.**

3. **Establish a wind down routine before bedtime.**

4. **Avoid going to bed stressed/angry/nervous and refrain from executive function (thinking, planning worrying in bed).**

5. **Reduce/avoid consumption of caffeine in the evenings**

Technology use reduction near bedtime, not surprisingly, was an issue that came up repeatedly and was the #1 goal people set overall. Research has shown that the blue light emitted from screens can affect our natural circadian rhythms and disrupt our sleep patterns.

The National Sleep Foundation has excellent evidence-based resources and specific recommendations for achieving each of these goals. We highly recommend their website as a reliable and valid resource for improving sleep health: https://www.sleepfoundation.org/

MESH Study Findings

The MESH intervention was comprised of two parts:

1) A 1-hour online Family and Sleep Supportive Training for Leaders on providing support for employees' family life and for sleep health

2) Individualized feedback on sleep quantity and quality, measured by a sleep tracking device that participants wore for 3 weeks, on average (i.e., actigraphy)

Participation Rates

Employees and supervisors who were in the **intervention group** - the group who received the sleep feedback and the supervisor training - participated in this portion of the study (482 in intervention). The table below details participation rates in the Sleep Feedback and the Family and Sleep Supportive Training for Leaders (FaSSTL).

|	Sleep Feedback		Leader Training - FaSSTL	
	Service Members in Intervention Group	Feedback in-person or by phone	Supervisor Training invites	Supervisor Training completes
Army	193	163 84.5%	104	87 83.8%
Air	283	223 83.0%	108	67 67.8%
Total	**476**	**398 83.6%**	**212**	**154 72.6%**

Ratings of Family and Sleep Supportive Training for Leaders (FaSSTL)

KEY FINDINGS:
Supervisors rated the training favorably and learned from the training, based on their pre- and post-test scores.

Reaction Question	% Agreement
How do you **rate the information** in today's training?	Good/Excellent = **77.5%**
How **useful** for your work is the information you learned today?	Useful = **90.4%**
How **relevant** to the content of your job is the information you learned today?	Relevant = **90.4%**
Would you **recommend** this training to other co-workers?	Yes, as is or with some improvement = **83.6%**

Knowledge Gain due to FaSSTL
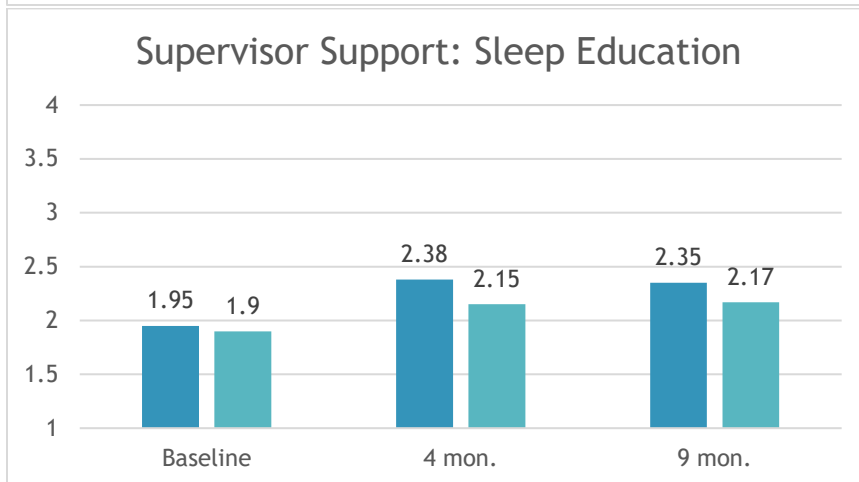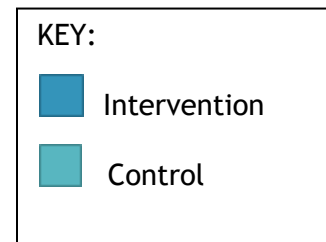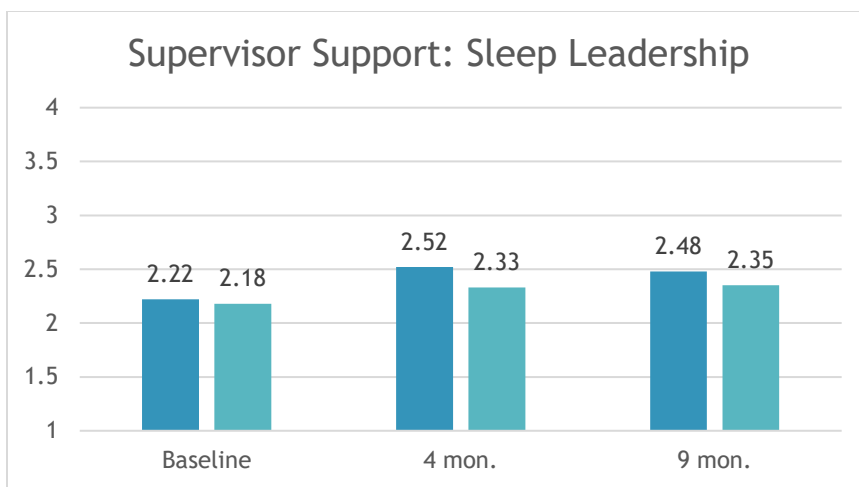
- Pre: 71.2%
- Post: 86.1%
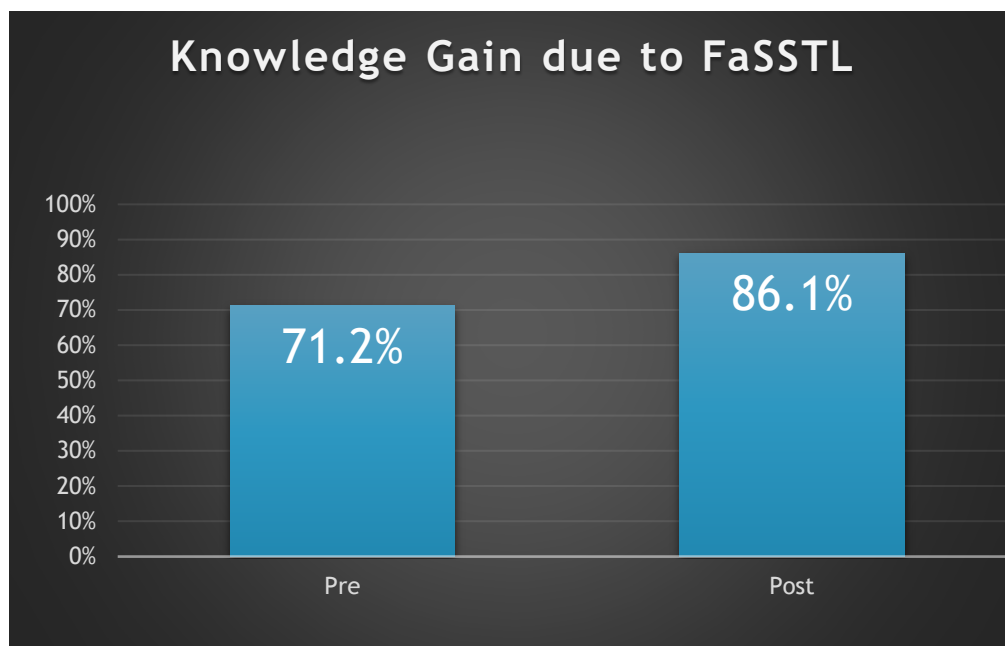
Impact of the MESH Intervention

The next several pages summarize the statistical analyses we ran using survey data to determine if the intervention – the supervisor training and the sleep feedback – had an effect on critical outcomes.

SUPERVISOR SUPPORT BEHAVIORS

> **KEY FINDING:**
> Service members in the intervention group reported more support from their supervisor on sleep health, both in terms of *Sleep Leadership* and *Sleep Education*.

Supervisor Support: Sleep Leadership

	Baseline	4 mon.	9 mon.
Intervention	2.22	2.52	2.48
Control	2.18	2.33	2.35

KEY:
- Intervention
- Control

Supervisor Support: Sleep Education

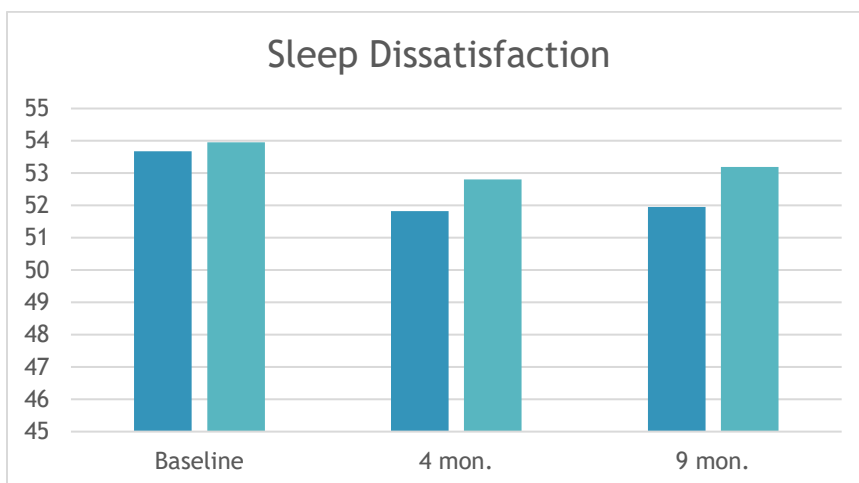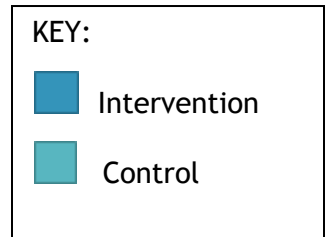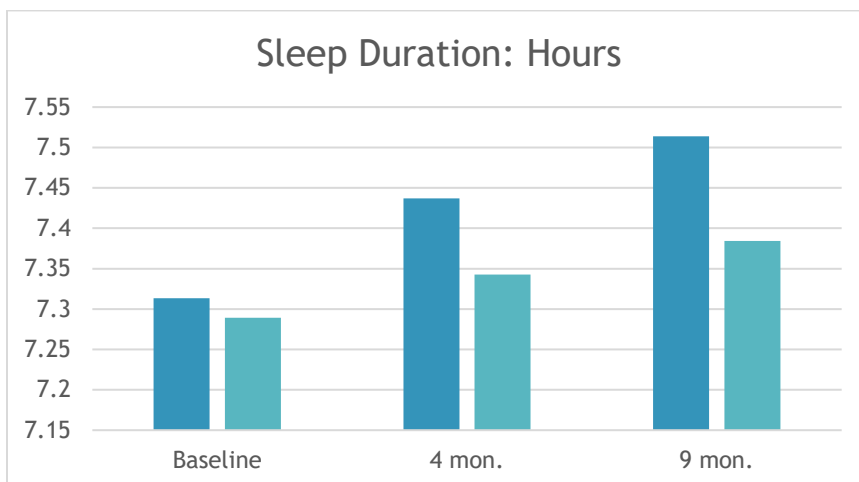|	Baseline	4 mon.	9 mon.
Intervention	1.95	2.38	2.35
Control	1.9	2.15	2.17

Sample statement: "My supervisors encourages subordinates to catch up on sleep before missions that require long hours."

IMPACT ON SLEEP

> KEY FINDING:
> **We saw significant improvements in sleep quantity and quality in the intervention group compared to the control group.**

- Service members in the intervention group slept an average of **15-20 minutes longer per night** after the training and feedback than the control group.

- Sleep dissatisfaction, which is a measure of sleep *quality*, shows that service members in the intervention group became **more satisfied with their sleep** after the training and feedback, compared to those in the control group.

Sleep Duration: Hours

	Baseline	4 mon.	9 mon.
Intervention	7.31	7.44	7.51
Control	7.29	7.34	7.38

KEY:
- Intervention
- Control

Sleep Dissatisfaction

	Baseline	4 mon.	9 mon.
Intervention	53.7	51.8	51.9
Control	54.0	52.8	53.2

IMPACT ON WELL-BEING: COUPLE-LEVEL FINDINGS

KEY FINDING:
Service members <u>AND their spouse/partners</u> in the intervention group experienced greater well-being outcomes than those in the control group.

Life Satisfaction

How Responsive is your Spouse/Partner?

Loneliness

KEY:
- Intervention
- Control
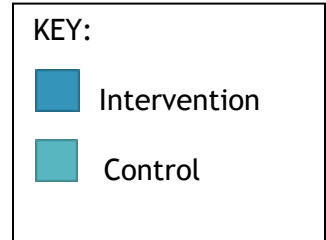
Sleep can have impacts on many facets of health and well-being. We found that those in the intervention group reported:

- *Higher life satisfaction* after the intervention and were even *less likely to feel lonely* than those in the control group

- A *better relationship* with their spouse or partner compared to those in the control group

- **These findings also held for *spouses/partners* even though they were not directly involved in the intervention. The positive effects from the service member spilled over to have a beneficial effect on their partner as well**.

- Additional analyses of spouse/partner data is ongoing and we recommend checking our website for updates: www.supportiveworkplaces.org

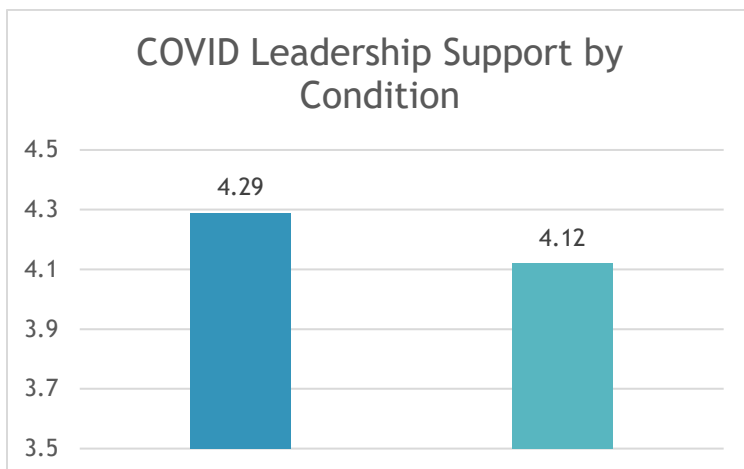## Additional Impacts of the MESH Study Intervention

KEY FINDINGS

Other analyses have revealed that service members in the intervention group were:

- More **satisfied with their jobs**
- Less likely to be looking for a **new job** outside the ORNG
- Improved **social and personal functioning**
- Less likely to be **stressed at bedtime**

COVID Supplemental Data Collection

The timing of the COVID-19 pandemic presented a unique opportunity to understand how such a major world-wide event could impact ORNG employees. In November 2020, we sent surveys to all participants who had completed surveys at baseline. About 50% of ORNG employees completed surveys, along with their spouses/partners who had almost a 60% return rate.

Perceptions of leadership effectiveness during COVID were assessed, as well as other psychological health and well-being outcomes. An example item of the "COVID Leadership" measure is "My supervisor leads by example by following health guidelines to reduce the spread of COVID-19." **Supervisors in the intervention group were rated as being more effective leaders during COVID by their employees than those in the control group.** This demonstrates that leaders were able to generalize their learned supportive behaviors from the MESH intervention that occurred at least 1 year earlier, to leadership during the pandemic. In addition, we found that employees who had a more supportive leader during COVID generally experienced less psychological distress.

COVID Leadership Support by Condition

Intervention	4.29
Control	4.12

(Bar chart; y-axis ranges from 3.5 to 4.5)

KEY:
- Intervention
- Control

Leaders were able to generalize their learned supportive behaviors from the **Family and Sleep Supportive Training** that occurred at least 1 year earlier, to leadership during the pandemic

Conclusion

The goal of the MESH Study was to improve the health and well-being of service members in the Oregon National Guard by improving the support they received from their supervisors on family functioning and sleep, as well as by providing them with individualized information on their sleep quantity and quality. As the data in this brief report demonstrates, these goals were accomplished.

The Family and Sleep Supportive Training for Leaders was effective, as Supervisors learned based on pre-test and post-test evaluations, and rated the training to be informative, useful, and relevant – and this is also reflected in the improved support ratings from their subordinates.

Data on the effects of the FaSSTL training on service members showed the MESH intervention to have positive effects on not only sleep, but also their well-being, work, and personal relationships.

The MESH Study had beneficial effects on the well-being of spouses and partners of ORNG service members.

Data continue to be analyzed by the MESH team and will be shared with the ORNG as it unfolds. Any research we publish will be listed on the website, including easy-to-digest summaries.

More information about the study, including free access to the training, can be found at www.supportiveworkplaces.org.

We hope you found this report informative and interesting and that it helps you reflect on your own sleep. If you are a leader in the ORNG or elsewhere, this is a good opportunity to talk to your unit about their sleep health. Remember the *Family and Sleep Supportive Training for Leaders* is available on the Supportive Workplaces website.

For additional training, we have recently created a new website that houses all the trainings we have developed and tested, just as we have with the MESH Study. You can find these trainings at Supportive Workplaces. Other questions? Email us at supportiveworkplaces@ohsu.edu.

SLEEP RESOURCES

Looking for more information about a specific sleep topic?

We recommend the following two resources:

- **National Sleep Foundation:** *www.sleepfoundation.org*
- **American Academy of Sleep Medicine's Sleep Education Website:** *www.sleepeducation.org*