

A qualitative analysis of decision making and research utilization among firefighters

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Background

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Firefighters undergo significant occupational health burdens, such as **physical exertion**, **emotional trauma**, and **sleep deficiency**, all impacting firefighters and their families.

During off hours, firefighters reconcile physical and emotional recovery with family and home responsibilities.

Background

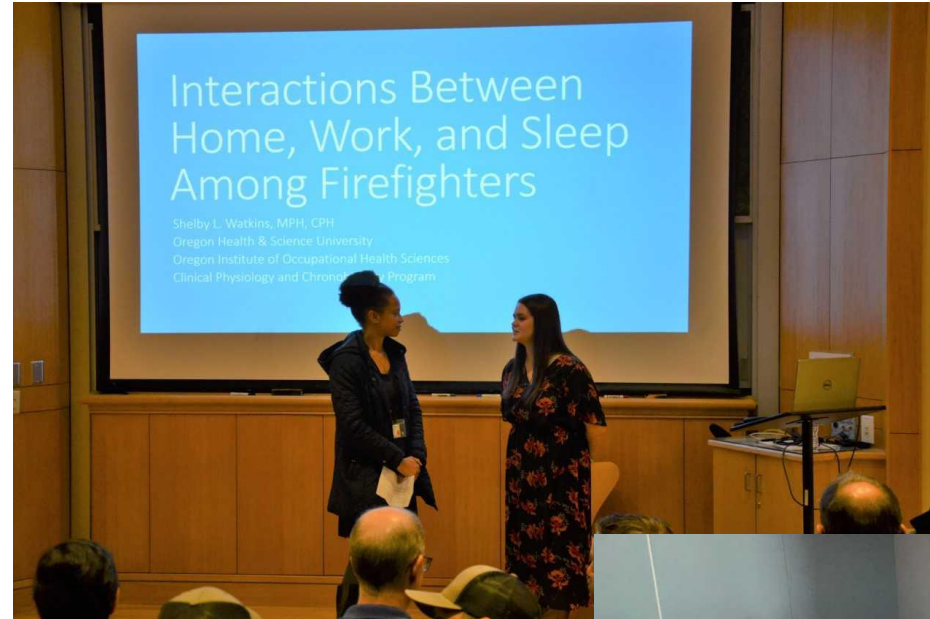
- Traditional work schedule: 24-hours on/48-hours off schedule (24/48) (Portland, OR)
- New alternative schedule: 24-hours on/72-hours off/48-hours on/72-hours off shift schedule (1/3/2/3) (Eugene, OR)
 - Suggested as a better schedule due to increased consecutive days off

Example Shift Schedules for 24/48 and 1/3/2/3

	Day	24/48	1/3/2/3
		24h	24h
	D 1		
	D 2		
	D 3		
	D 4	24h	
	D 5		24h
	D 6		24h
	D 7	24h	
	D 8		
	D 9		
	D 10	24h	24h
	D 11		
	D 12		
	D 13	24h	
	D 14		24h

Background: Parent Study

- Cross-sectional CBPR pilot study evaluating sleep, health, and safety among full-time firefighters
 - 24/48 and 1/3/2/3 firefighters
- Three 2-week study periods every ~3 months (May 2020-March 2021)
- Measured:
 - Heart rate and BP
 - Stress markers
 - Sleep
 - Alertness
 - Mood
 - Caffeine & Fluid Intake
 - Recovery
 - Family dynamics



Personalized Result Snapshots



Shift Work in Firefighters Pilot Study: SWIFT

Apr 2021

PERSONAL AVERAGE RESULT SNAPSHOT*

The purpose of the SWIFT study:

- To examine the current occupational, health and family burdens Portland firefighters are facing

The results highlighted will show:

- Preliminary personal health effects the 24/48 shift schedule has on your psychosocial determinants of sleep (e.g., work-life conflict, mood), sleep duration and quality, safety and cardiovascular risk
- Includes information collected during the COVID-19 pandemic and 2020-2021 civil unrest and wildfire season

STUDY RESULTS

Blood Pressure



120/80

Average 24-h
blood
pressure

Healthy 24h ambulatory
blood pressure: <130/80

12%

Average Systolic
Night Time
Dipping

If <10%: potential
indicator of CVD risk

18%

Average Diastolic
Night Time
Dipping

If <10%: potential
indicator of CVD risk

Sleeping Heart Rate



*Average HR on/off shift during rest. Day time measures have not yet been analyzed.

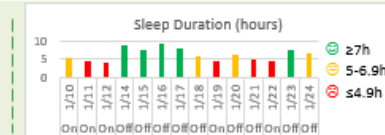
Sleep



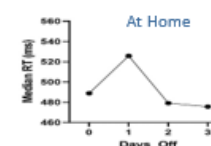
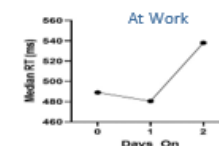
	May/June	October	January
Avg sleep duration, on shift (hour)	5.8	5.2	3.2
Avg sleep duration, off shift (hour)	7.4	6.5	7.1

Recommended Sleep Duration: 7-9 hours

*Daily sleep currently represents nighttime sleep only



Reaction Time



45% of total responses >500ms

At Work: Slower reaction times
as # of days on shift increase

At Home: Faster reaction times
as # of days off shift increase

Project Aims

1. Gather participant insights regarding effectiveness of dissemination deliverables
2. Transfer the role of dissemination from the researcher to end-users

Qualitative Methods

- 14 individual interviews (~30 min-1h)
 - 88% of 24/48 participants
- Conducted via WebEx (video conferencing)
 - Recorded with Audacity
 - Transcribed by Rev
- Analyzed using:
 - Grounded Theory
 - NVivo12+

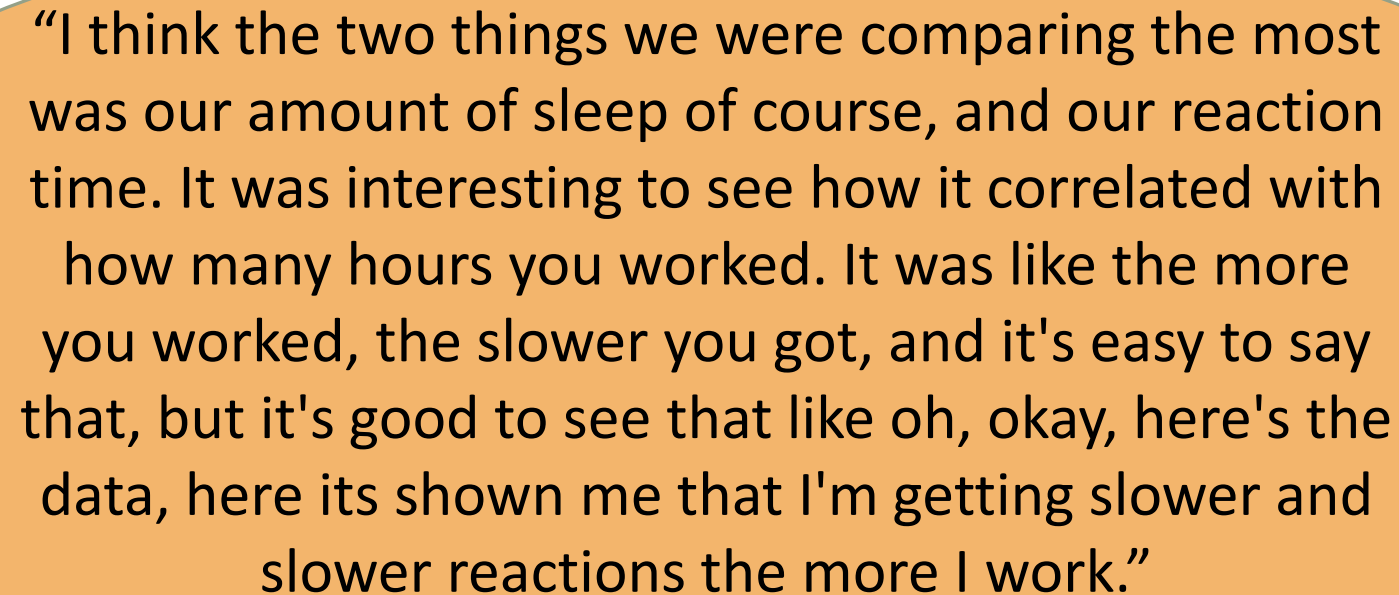
Results

Aim 1: Results

Interview Results

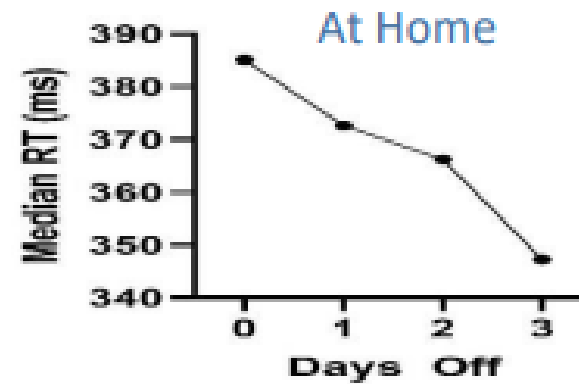
Relevant Themes	# of References
<u>Streamlined and visual results key for firefighter research deliverables</u>	40
• Use of colloquial language and consolidation of pertinent results	19
• Concise result interpretations needed to understand direction of health results	17
• Visual confirmation leads to increased urgency for health behavior and organizational change	7
<u>Increased focus on sleep quantity at home and work</u>	32
• Improved personal and collective action to improve sleep quantity at the fire station	21
• Improved focus on increasing sleep opportunities and quantity at home	11
<u>Increased awareness to implement policies to improve firefighter health and wellness</u>	22
• Policies to reduce call volume	11
• Increased interest in alternative shift schedules	8
• Additional organizational programs/policies focused on prioritizing mental and physical health	3

Streamlined and visual results key for firefighter research deliverables



“I think the two things we were comparing the most was our amount of sleep of course, and our reaction time. It was interesting to see how it correlated with how many hours you worked. It was like the more you worked, the slower you got, and it's easy to say that, but it's good to see that like oh, okay, here's the data, here its shown me that I'm getting slower and slower reactions the more I work.”

Reaction Time

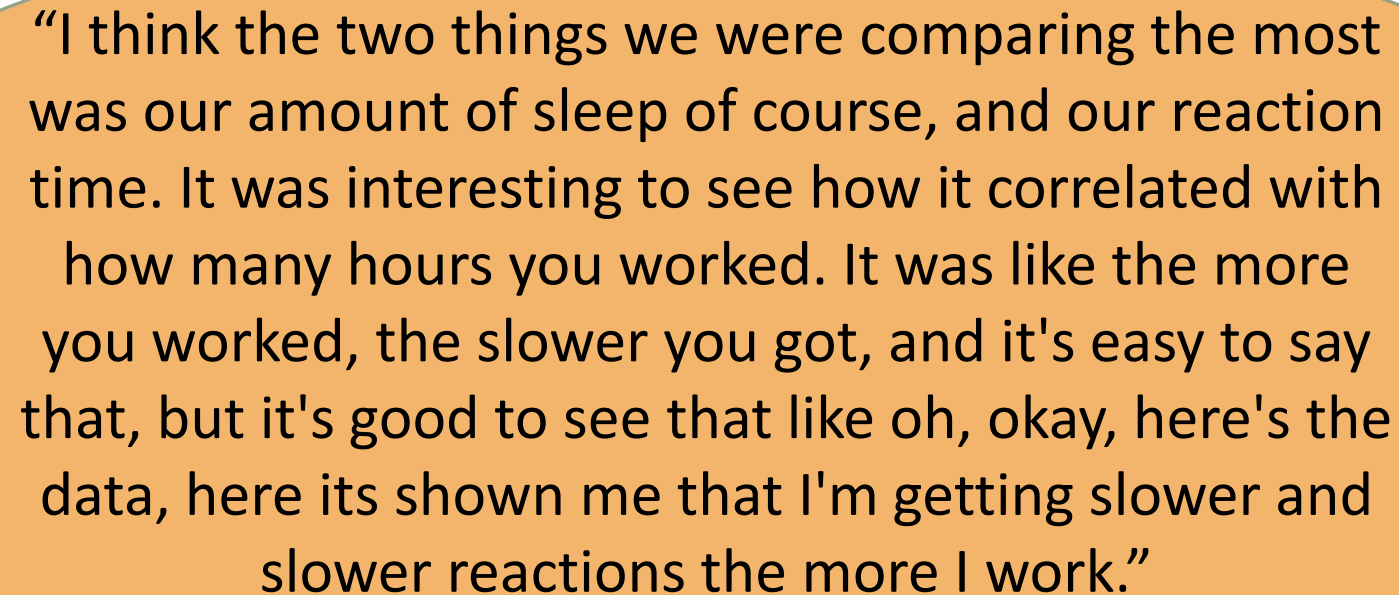


77% of total responses >355ms

At Work: Slower reaction times
as # of days on shift increase

At Home: Faster reaction times
as # of days off shift increase

Streamlined and visual results key for firefighter research deliverables



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Increased focus on sleep quantity at home and work

At home:

“Yeah. I'm always tired. I mean, [my significant other] knows that I only sleep in four hour chunks. So to kind of see it visually, and see that my best day was like five hours, we're trying to figure out how to stretch that four hours and I don't want to sleep with ear plugs in, because I want to be able to hear things around the house. So we're kind of toying with what to do there, how to lengthen my sleep cycle.”

At work:

“I've been trying to go to bed earlier at work and maximize the sleep that I can get and drink less on my off days so that my sleep is better on my off days. I would say that in conjunction with everything else that I've been experiencing in life, this [pilot study results] was just another encouragement to try to prioritize getting more sleep, certainly. I wouldn't say that it was what started the whole thing but it definitely helped. Helped to motivate me down that path.”

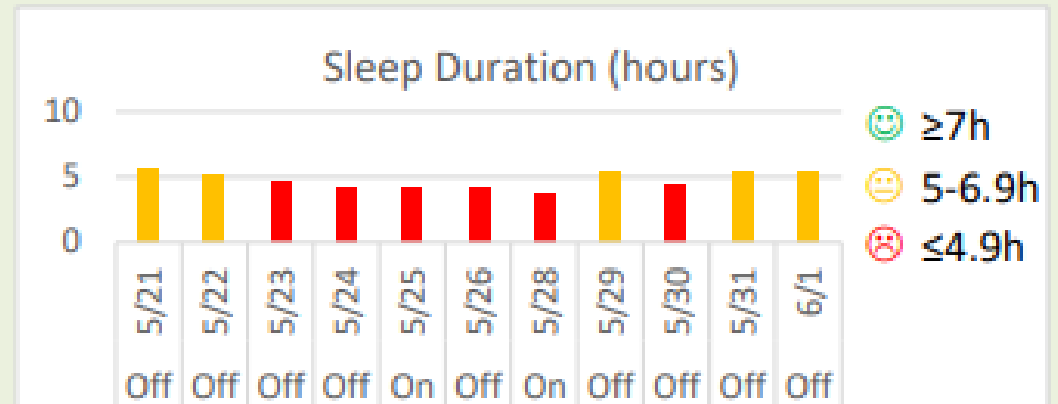
Sleep



	May/June	October	January
Avg sleep duration, on shift (hour)	4.0	4.4	5.9
Avg sleep duration, off shift (hour)	4.9	4.4	5.7

Recommended Sleep Duration: 7-9 hours

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Increased awareness to implement policies to improve firefighter health and wellness

“Because their [fire department’s] fix to everything is, well just don't work there [at a busy station]. But, everybody who works there wants to be busy and wants to be there. So it would just be nice if they would just add some policy after looking at this data and address, maybe we need to add a second rig or maybe we need to give guys an extra mental health day every month. But have the city, really look at the data that you're getting and see we've got guys that are super tired, they're working day in, day out, and there's not enough recovery time. The downtime at work isn't enough.”

Interview Results

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Streamlined, visual health results can positively impact firefighter sleep behaviors and overall awareness of general health behaviors and occupational health policies

Preliminary Conclusions

These initial findings increase our understanding of how firefighters utilize research outcomes and the deliverables that are most impactful for their understanding of their health and wellness

Aim 2: Results

Dissemination Champions Committee

- Committee made up of:
 - 12 full-time firefighters/paramedics
 - Includes line firefighters, lieutenants, and station captains
- Work in conjunction with:
 - Portland Fire & Rescue Management
 - Portland Fire & Rescue Health and Wellness Coordinator
 - IAFF Local 43 Health and Wellness Committee



Dissemination Champions Committee

Areas of Focus

- Evaluate/develop dissemination strategies and action plans for firefighters
- Facilitate distribution of information on shift schedules and health information
- Support recruitment/research efforts of future health and wellness studies

Next Steps

- Increase interview sample size!
 - Interview 1/3/2/3 firefighters on dissemination deliverables and research utilization
- Increase spread of pilot results and recruitment efforts for upcoming study
 - Podcasts:
 - IAFF Local 43
 - Oregon Healthy Workforce Center

Next Steps: Research Utilization and Dissemination Survey for PF&R

- 5 random fire stations will participate 1-month post final podcast
- Survey will touch on:
 - Barriers, facilitators, and feasibility pertinent to the podcasts
 - Reflection on how the study's results and the upcoming shift change may impact:
 - Health, safety, and well-being
 - Preferences for specific shift schedules

Acknowledgments

PARTNERS

- Portland Fire & Rescue
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- Dr. David Hurtado
- Dr. Steven Shea
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PTOP awardees present at Northwest Occupational Health Conference



PTOP provides awardees with resources to pursue a project that will increase their own occupational health experience as well as improve the health of workers in the Northwest region.

October 29, 2021

The Northwest Center for Occupational Health and Safety (NWCOHS)'s [Professional Training Opportunities Program \(PTOP\)](#) provides small grant funding to support awardees from all disciplines for projects and activities that address worker health and safety.

Past awardees have used their PTOF funding to increase capacity for maritime safety training on the North Slope of Alaska, support workers engagement with important Process Safety Management standards in their workplaces, and to develop virtual reality training modules for professionals working in confined spaces.

Northwest Occupational Health Conference 2021 Presenters

Last year PTOF funded 4 awards. Three of our 2020 awardees and one 2019 awardee presented at the Northwest Occupational Health Conference (NOHC) on October 22, 2021. We enjoyed hearing from our awardees on the incredible work they have done on their PTOF projects.

Amber Vermeesch from the University of Portland presented on “Enhancing Vital Practice in a School of Nursing” where she focused on increasing the well-being of workers in the School of Nursing by decreasing individual and institutional-level contributing factors to compassion fatigue and burnout.

Shelby Watkins from Oregon Health and Science University shared her work, “A qualitative analysis of decision making and research utilization among firefighters.” She collected feedback from firefighters on their personalized health effects snapshots of psychosocial determinants of sleep, sleep duration and quality, safety and cardiovascular risk. Secondly, she explored dissemination strategies for this health and safety information as well as potential future health and wellness initiatives.

Wendi Zhou of the University of Washington presented her “Seattle COVID-19 Oral History Project.” She created an oral history archive documenting the lives of workers impacted by COVID-19, with an emphasis on occupational health and safety in Seattle and the Western Washington area.

Megan Shoeyink from Portland State University shared her project, “Examining Psychological Health Among Oregon Migrant & Seasonal Farm Workers.” She explored what motivates workers, the physical and mental aspects of work that threaten their health, and the conflict between maintaining employment and risks to personal health.