Increasing Sleep Health Knowledge in Firefighters Through Education

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NURS 703B: DNP Project

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February 28th, 2024

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Abstract

Firefighters have a unique risk profile predisposing them to sleep deprivation and its adverse health effects, which include disease and dysfunction across cognitive, systemic, and psychological domains. In partnership with a fire and rescue company located in Washington County, Oregon, this project intended to promote health and wellbeing in firefighter populations through sleep health education. Educational material was developed and provided to in-service firefighters in the form of a handout accompanied by a sleep health presentation. A pre-post retrospective survey was provided immediately following the intervention to assess knowledge change in key sleep health concept areas as well as to understand firefighters' level of engagement with the material. The specific aim of this project was to increase firefighter knowledge in three primary areas of sleep health by at least 25% from a self-assessed baseline level. These areas encompassed the short-term adverse health effects of sleep deprivation, effects of chronically disordered sleep, and adjustable lifestyle factors that can help improve sleep. Survey results demonstrated a 29.41%, 28.24%, and 30.59% increase from baseline knowledge levels in these areas, respectively, as well as positive engagement with the material and format of education. 17 firefighters across three fire stations received the education. Overall, this project contributes to the evidence of the effectiveness of sleep health education towards improving firefighter knowledge of sleep health concepts and lays the groundwork for expansion of sleep health education at a larger scale within the partner organization.

Introduction

Problem Description

Firefighters are exceptionally vulnerable to sleep deprivation and its adverse health effects due to the unique demands of their work environment, the state of hyperarousal this setting promotes, and the psychosocial impacts of the firefighting role. These occupational risks are layered on top of a background setting wherein modern society continues to experience increasing rates of sleep deprivation and associated adverse health effects (Papatriantafyllou et al., 2022).

The work environment of firefighters is filled with myriad impediments to attaining sufficient sleep. Work shifts often meet or exceed 24 hours and involve frequent unpredictable awakenings in response to calls for assistance (Alves et al., 2023; Watkins et al., 2020). Variation in fire station sleeping quarters, call notification systems, alarm volume, bunk room lighting levels, and station policies on sleep hours and napping can also adversely impact the sleep of firefighters (Carey et al., 2018; Watkins et al., 2020). Maintaining a state of constant readiness is challenging, and the stimulant caffeine is commonly used by firefighters to help stay awake during shifts, while alcohol, a substance known to impair sleep quality even in small quantities, is frequently used off shift to cope with the stress of the role (Alves et al., 2023; Dobson et al., 2013; Vargas et al., 2013). When returning home after work, firefighters often struggle to balance their own needs with familial and social obligations, often prioritizing these activities over time spent sleeping (Watkins et al., 2020).

Cumulatively, firefighters experience higher levels of primary sleep disorders as compared to non-shift workers, with concerning implications for their health (Barger et al., 2015). A national survey of 6933 firefighters found that 37% of the surveyed firefighters screened positive for a common sleep disorder such as obstructive sleep apnea, insomnia, shift work disorder, and restless leg syndrome (Barger et al., 2015). Of those who screened positive, 80% were undiagnosed or untreated and were two times as likely to be diagnosed with diabetes or cardiovascular disease, three times as likely to be

diagnosed with anxiety or depression, and twice as likely to experience a motor vehicle crash (Barger et al., 2015). Alongside primary sleep disorders, firefighters are at risk of developing Post Traumatic Stress Disorder (PTSD) given routine exposure to traumatic events (Hong et al., 2020). PTSD has a prevalence rate of 6.5-37% among firefighters and can cause nightmares, a common cause of disturbed sleep in this population (Hong et al., 2020; Jang et al., 2020).

Available Knowledge

A search of the PubMed, CINAHL, and OVID Medline databases was conducted looking for articles published no earlier than 2016 and by using the following combination of terms: “firefighter and sleep and education”, “firefighter and sleep deprivation”, “firefighter and sleep and improvement”. The first three pages of results for each search were reviewed for relevance, duplicate articles were removed, and five articles were identified for inclusion. All five studies investigated methods of improving firefighter sleep quality, though differed significantly in their design.

Interventions by Sullivan et al. (2017), Jang et al. (2020), and Barger et al. (2016) each delivered sleep health education via in-person training sessions. Barger et al. (2016) facilitated sessions both with expert-led groups as well as groups led by study investigator-trained employees of the fire service. This differed from Jang et al. (2020) who utilized a clinical psychologist to deliver content, and Sullivan et al. (2017) who led sessions with a study investigator. A common drawback to educational sessions was the time required of firefighters and the logistical challenge of taking them out of service for in-person education (Jang et al., 2020; Sullivan et al., 2017). Barger et al. (2016) additionally piloted sleep health education via web-based content, an approach similar to the work of Brumfield et al. (2023).

Barger et al. (2016) primarily focused on identifying ideal methodologies for delivering sleep health education to firefighters, ultimately determining that all three previously mentioned methodologies were effective; expert-led sessions were determined to be the most efficacious approach, albeit the most expensive. In contrast, Sullivan et al. (2017), Brumfield et al., (2023), and Jang

et al. (2020) focused on the impact of sleep health education rather than attempting to determine an ideal methodology for content delivery. Sullivan et al. (2017) and Jang et al. (2020) demonstrated positive outcomes of providing sleep health education to firefighters, with Sullivan et al. (2017) finding fewer on the job injuries alongside a reduction in disability days, and Jang et al. (2020) finding a reduction in firefighter insomnia, nightmares, nighttime awakenings, and time to sleep onset. Brumfield et al. (2023) noted an increase in firefighter knowledge about sleep health and a reduced frequency of poor sleep, but these increases were not statistically significant due in part to a small sample size. In addition to delivering sleep education, Barger et al. (2016) and Sullivan et al. (2017) screened firefighters for primary sleep disorders, subsequently providing the 40-42% of firefighters who screened positive for a sleep disorder with appropriate avenues for follow-up care.

In contrast to the aforementioned studies, Carey et al. (2018) sought to improve sleep health by focusing on fire station environmental factors. The authors of this study found reductions in sleep disturbance, firefighter blood pressures, and firefighter heart rates by reducing the sound volume of station alarms and the intensity of bunk room lighting (Carey et al., 2018). While promising, this small sample size study was completed at a single fire station and did not yield widely generalizable results (Carey et al., 2018).

Rationale

It is well understood that sleep deprivation adversely impacts health and that attaining sufficient quality sleep is a key factor in promoting overall mental, physical, and emotional well-being (Worley, 2018). Cognitively, short term sleep deprivation increases risk taking behavior and impulsivity while simultaneously reducing attention, reaction time, learning ability, memory formation, and emotional processing (Krause et al., 2018). Concerning chronic systemic disease, sleep deprivation is associated with increased heart disease and hypertension, increased insulin insensitivity and glucose intolerance, endothelial dysfunction and atherosclerosis, reduced immune system function, metabolic dysregulation,

weight gain, and Alzheimer disease (Liew & Aung, 2021). Psychologically, disturbed sleep is closely associated with increased stress as well as disorders such as anxiety and depression (McEwen & Karatsoreos, 2022). The potential health effects of sleep deprivation are concerning for any demographic, but particularly for firefighters given the unique risk profile generated by their vocation. Identifying strategies and interventions to improve sleep health in firefighters holds the potential to improve long and short-term health outcomes in this population.

During a root cause analysis, it was discovered that sleep health education was not included in firefighter health outreach efforts at the partner organization. Through a review of the literature, it was determined that delivering in-person sleep health education to firefighters can result in improvement of surrogate markers of sleep health and is a viable approach to sleep health education so long as educational sessions are brief and logistically considerate of a firefighter's work obligations.

This project utilized Pender's Health Promotion Model as a framework for developing and delivering health promoting education. Pender's model demonstrates that healthcare professionals can help identify and influence modifiable behaviors in an effort to encourage healthy lifestyles in individuals and communities (Aqtam & Darawwad, 2018). Additionally, to make use of iterative improvement, this project utilized the concept of plan do study act (PDSA) cycles from the Model for Improvement (MFI); a model that has been used extensively in healthcare organizations to guide change, initially on a small scale, and determine if the intervention leads to improvement (IHI, 2023).

Specific Aims

The purpose of this project was to deliver sleep health education to firefighters at an Oregon fire and rescue company in order to promote sleep health and well-being in this population. The project aimed to increase firefighter knowledge by 25%, from a self-assessed baseline level, in the following knowledge domains: health impacts of short-term sleep deprivation, health impacts of chronically disturbed sleep, and knowledge of lifestyle factors that can influence sleep quality.

Methods

Context

Interventions were completed at select fire stations of a fire and rescue company based in Washington County, Oregon that employs over 500 career firefighters and provides emergency medical aid and fire protection services to more than 500,000 residents. At this organization, fire station crews range in size from two to nine firefighters and are composed of paramedics and emergency medical technicians. Typical shifts last 24 hours with the possibility of an additional 24 hours in overtime.

This project's sleep health training was the first of its kind at the partner organization and comes at a time when emergency medical service companies are experiencing a sustained increase in medical 911 calls (Somers et al., 2020). A higher call volume for firefighters frequently translates to less time spent sleeping and more sleep interruptions, further exacerbating the challenges this population faces in attaining sufficient quality sleep. The factors driving this trend are complex, intertwined, and include an aging population, mental illness, homelessness, and substance misuse, alongside social determinants of health factors such as socioeconomic status and healthcare access barriers (Kant et al., 2018; Sanko et al., 2020; Tangherlini et al., 2016).

Interventions

Sleep health educational material was developed using the available literature, and this knowledge was tailored to address factors influencing sleep that are relevant to firefighter populations. This information was distilled to a one-page handout document designed to promote sleep health by addressing quick tips for improved sleep, reviewing common adjustable lifestyle factors that impact sleep quality, providing recommendations for altering these factors, and by reviewing treatable health conditions known to impact sleep that are common in firefighter populations. The handout was combined with a sleep health education talk and provided to on-duty firefighters at fire stations. In addition to expanding on content provided with the handout, the sleep health talk provided information

about the short and long term potential adverse health effects of disordered sleep. A pre-post retrospective survey was issued to participants immediately following the sleep health talk to compare baseline levels of sleep health knowledge domains with levels after the intervention. The retrospective pre-post design was utilized in an effort to reduce overall intervention time and optimize focus around the education session. An assigned liaison from the organization helped enable scheduling of the educational sessions with individual fire stations.

Study of the interventions

The study of this intervention involved evaluation of firefighter responses provided on the retrospective pre-post survey. Data gathered from this survey helped inform the effectiveness of the intervention in improving firefighter knowledge in specific domains of sleep health as well as in understanding if the educational content was engaging to participants as presented.

Measures

The outcome measures for this project are the percentage change, as compared before and after the educational intervention, in self-reported knowledge of the three previously described sleep health knowledge domains. This data enabled assessment of whether firefighter knowledge increased in these areas following the intervention. Tracking time spent delivering the education and time onsite at fire stations helped enable refinement of education delivery for subsequent sessions.

Analysis

This project was implemented between September 2023 to October 2023. Survey data was collected after education sessions, compiled in an Excel spreadsheet, and subsequently analyzed using a mixed methods approach. Quantitative data was reported as a percentage change from baseline to a post-intervention level of knowledge and was displayed using bar graphs, while a thematic analysis was used to assess qualitative data for themes emerging from the feedback.

Ethical Considerations

Participants were informed about this project prior to its implementation. Participation in the sleep health education and survey was voluntary and firefighters were aware their responses would be used as a part of this project. Survey data was anonymous, and no identifying characteristics of the participants were used to analyze collected survey data. This project was approved by the OHSU Investigational Review Board as STUDY00026040.

Results

Results

Over the course of three PDSA cycles, sleep health education was delivered to 17 firefighters across three fire stations. Paper survey handouts were completed immediately following education sessions, with a response rate of 100% across all participants. Cycle one was completed at a fire station with two firefighters on duty, the second with nine firefighters, and the third with six. Time to deliver the training in cycle one took 15 minutes and was followed by seven minutes for questions, cycle two took 12 minutes for education and 11 minutes for questions, and cycle three took 12 minutes for education and eight for questions. Total time onsite at the fire station surrounding cycles one, two, and three, was one hour and 53 minutes, one hour and 28 minutes, and 36 minutes, respectively. Time on site was substantially elevated during cycles one and two on account of firefighters being called away for an emergency call prior to the educational sessions.

The first three survey questions were asked in a retrospective pre-post format and utilized a one to five Likert-based scale. The first question asked, “How do you rate your knowledge of the ways poor sleep can affect health in the short term (days)?”, the second inquired, “How do you rate your knowledge of the ways poor sleep can affect health in the long term (over many years)?”, and the third prompted, “How do you rate your knowledge of lifestyle strategies to help improve sleep health?”. Results demonstrated a 29.41%, 28.24%, and 30.59% average increase in self-rated knowledge, respectively.

The survey additionally included two free-text questions: Q4: “What worked well for you in today’s education?” and Q5: “What about today’s education could be improved?”. Themes emerging from an analysis of Q4’s feedback included the content being applicable to firefighters, satisfaction with the delivery approach of a short presentation accompanying a handout, and appreciation for simple information with actionable recommendations. The sole theme emerging from Q5’s feedback was a desire for more information surrounding the long-term impacts of chronically poor sleep.

In all three PDSA cycles, sleep health education was delivered immediately following dinner, a time when all firefighters were already gathered in one place, were unlikely to be occupied with tasks, and would be optimally focused for a brief educational session. This approach was incidentally trialed during the first PDSA cycle and, given success, was carried through to the remaining sleep health education sessions. Costs associated with the intervention were negligible and included fuel to drive to/from fire stations, paper for handouts, printing, paper clips, and pens.

Discussion

Summary

The project identified sleep health education as an opportunity to promote health and wellbeing in firefighters, a population at increased risk of developing adverse health effects from disordered sleep. Sleep health education, provided via a sleep health handout and an associated presentation, was provided to firefighter crews from a local fire and rescue company. Survey data demonstrated increased knowledge uptake of sleep health concepts from a self-assessed baseline level. Knowledge of the short-term health effects and health effects of chronically disordered sleep increased 29.41% and 28.24% respectively, while knowledge of lifestyle strategies to improve sleep health increased 30.59%. All quantitative results exceeded the project’s aims of increasing these knowledge domains by at least 25%, and qualitative responses suggested the educational format and content was well-received by participants and relevant to their experience as firefighters.

Interpretation

The results of this project suggest that sleep health education can be an effective method of improving sleep health knowledge uptake in firefighters. Further, qualitative survey feedback highlights positive participant engagement with the material, and three PDSA cycles demonstrate this education can be successfully integrated into the dynamic and unpredictable work environment of firefighters. These results are promising as to the potential viability of this educational approach at a larger scale.

As compared to findings in existing literature, this project echoed the findings of Barger et al. (2016) in suggesting that sleep health education is an effective method of improving sleep health knowledge in firefighter populations, but differed in that this project did not include a sleep disorder screening component. In contrast, to increase firefighter awareness of health conditions that can adversely impact sleep, this project incorporated education about treatable health conditions, including primary sleep disorders, which are common in firefighter populations. In addition to increasing awareness of these conditions, this approach was intended to limit session focus to education and condense the time required for the intervention. The educational intervention in this project was overall less time intensive than those delivered by Sullivan et al. (2017), Jang et al. (2020), and Barger et al. (2016), a design intended to reduce the opportunity for interruptions from emergency calls.

While the time required of firefighters to be present for this education was minimized, this approach necessitated greater selectivity in the content that could be included within the allotted time. Additionally, although this approach worked well to minimize the time required of firefighters to complete the education, optimizing training sessions for in-service firefighters was a trade off from an educator time requirement perspective as time on-site awaiting a viable opportunity to provide the education could significantly exceed the time needed to deliver the education.

Limitations

While initial results from the project were promising, the small sample size of participants relative to the population of firefighters within the partner organization limits the generalizability of the findings. In an effort to determine relevant content and an effective approach to delivering sleep health education to firefighters at this organization, this project measured knowledge uptake as opposed to measuring potential effects of receiving that knowledge such as evaluating surrogate markers of sleep health. Additionally, this project exclusively examined knowledge uptake immediately following an educational training session and did not capture data on long term knowledge retention. To improve potential for long term knowledge retention, firefighters were provided sleep health handouts to keep and additionally supplied with contact information for any follow-up questions. Survey format and questions were kept consistent across all PDSA cycles to optimize for a homogenous survey experience and minimize potential for confounding data.

Conclusions

This project contributes to the evidence of the effectiveness of sleep health education to improving knowledge of sleep health concepts in firefighters. The materials and approach to education developed through this effort lays the groundwork for expansion of sleep health education at a larger scale within a fire department setting. Potential opportunities for disseminating this education through existing organizational mechanisms include integrating the content into organization-wide wellness initiatives, new recruit academy training, and including sleep health material during annual firefighter physicals. Future work could expand on this project by examining outcomes further downstream of sleep health education such as long-term knowledge retention, sleep health behavior change, and impact on surrogate markers of sleep health.

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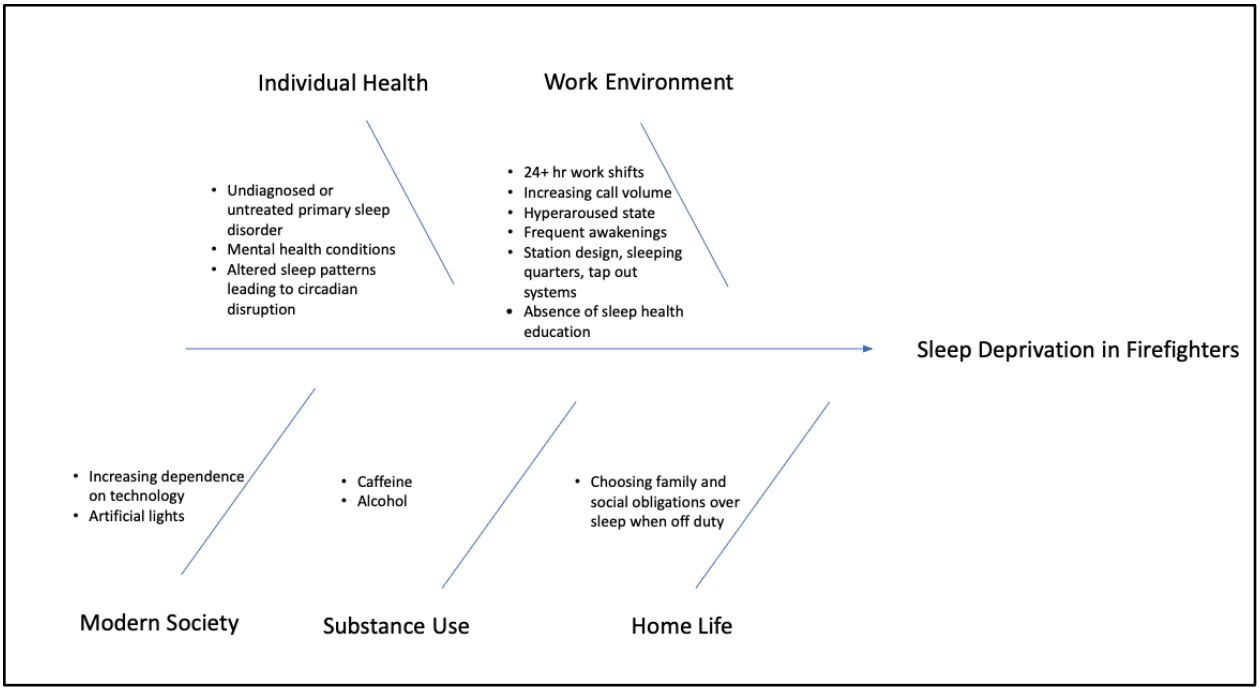
Appendix A

Cause and Effect Diagram



Appendix B

Project Timeline

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Dec-Mar
Finalize project design	X							
Complete IRB determination or approval		X						
Contracting with site, development of educational material and Logistics		X	X	X				
PDSA Cycle 1				X				
PDSA Cycle 2					X			
PDSA Cycle 3					X			
Final data analysis						X		
Complete final paper							X	
Prepare for project dissemination								X

Appendix C

Survey Questions

Sleep Health Education Survey

For the following 3 questions, fill in the bubble corresponding to your knowledge level ***prior*** to today's education and the bubble corresponding to your knowledge level ***after*** today's education.

1= Not knowledgeable at all
2= Slightly knowledgeable
3= Moderately knowledgeable
4 = Very knowledgeable
5 = Extremely knowledgeable

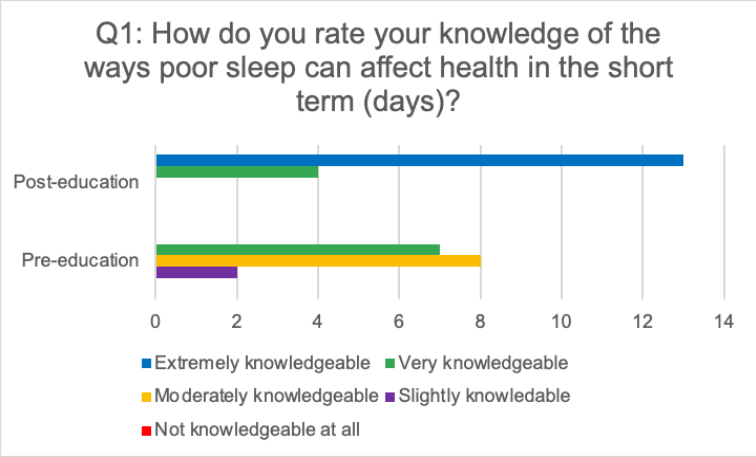
	Prior to today's education					**After** today's education				
	1	2	3	4	5	1	2	3	4	5
1. How do you rate your knowledge of the ways poor sleep can affect health in the short term (days)?	○	○	○	○	○	○	○	○	○	○
2. How do you rate your knowledge of the ways poor sleep can affect health in the long term (over many years)?	○	○	○	○	○	○	○	○	○	○
3. How do you rate your knowledge of lifestyle strategies to help improve sleep health?	○	○	○	○	○	○	○	○	○	○

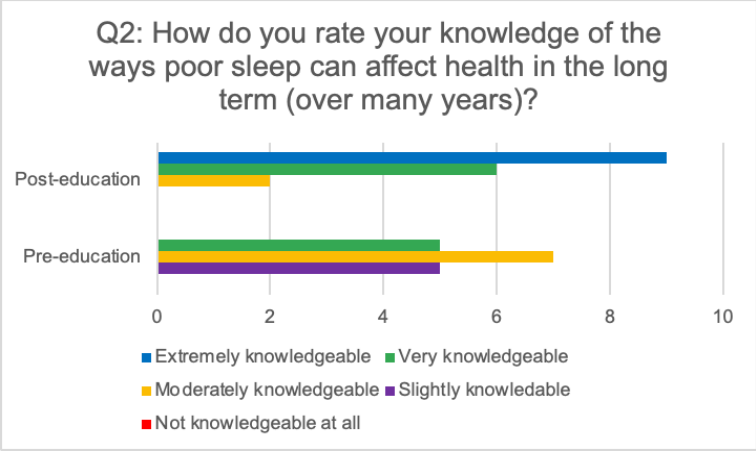
4. What about today's education worked well for you?

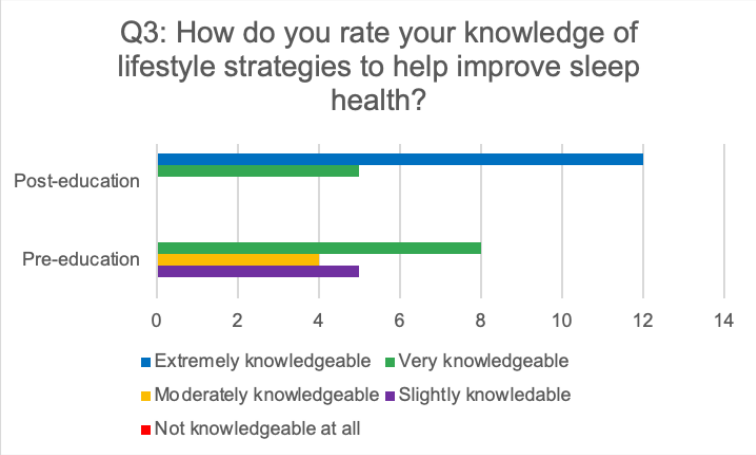
5. What about today's education could be improved?

Appendix D

Quantitative Survey Results, Cumulative Pre/Post Education Comparison







Appendix E

Qualitative Survey Results

Q4: What about today's education worked well for you?

- It was helpful to hear about the proper foods to eat or not eat before bed.
- Concise & informative
- I liked how you were speaking to each subject, not just reading the paper we got.
- Brought awareness to more of my current lifestyle habits that contribute to my poor sleep routine and over health / well being
- Knew info well and presented in a clear manner. I like the info provided and will work on doing them more to improve my sleep
- Gave good ways to time activities to improve sleep
- Short readable lists work well for me. Quick tips and health conditions were very informative.
- You were able to keep us focused and engaged - great information.
- The emphasis on the importance of having a schedule
- I relate to it
- Duration of presentation and information presented
- Good conversation about important information. I liked hearing about the blue light glasses.
- The timeline for when to eat and when to avoid certain things before bed
- Actual applicable fixes. Simple solutions.
- Small group setting was helpful. Great straight forward info.
- Lay out of information
- Casual conversation - easy to understand info.

Q5: What about today's education could be improved?

- I'm curious about more information on the mechanisms behind the effects.
- Have there been studies based on different shift schedules for FF? Including that info would be cool for us to know long term. Thank you for all the info :).
- Considerations to what improves/reduces the certain sleep cycles (i.e. what improves REM/deep sleep)
- Maybe provide suggestions for replacement lifestyles that could help with sleep
- I realize substances such as alcohol and sugar need to be reduced or eliminated.
- Can't think of any
- On top of lack of sleep from work (⅓ my life) I also feel I get enough sleep on days off but the quality is bad, and now I know why.
- Direct impacts of short/long term effects
- Everything was great!
- More information about the long-term health conditions
- Ways to apply some of the concepts covered to firehouse sleeping

Appendix F

Sleep Health Education Handout

Strategies for Improving Sleep

Quick Tips

Ideal amount of sleep: 7-9 hours every day
Ideal bedroom air temperature: ~66F. Avoid temps <62F or >77F
Noisy environment? Consider ear plugs and/or a white noise machine
Need a nap? Try to keep it <30 minutes and earlier in the day. Longer naps can lead to grogginess and disorientation upon waking.
Stress: Psychological stress can impair sleep. Exercise, meditation, massage, acupuncture, and sensory deprivation are all potential strategies to help relax. Find what works well for you.

Adjustable Lifestyle Factors

	How Sleep is Impacted	Recommendations
Alcohol*	Disrupts sleep by changing body temperature regulation, increasing awakenings, increasing urine production, and disrupting restorative phases of sleep.	1. Consider reducing the amount consumed. 2. Avoid drinking alcohol within 6 hours of bedtime.
Caffeine*	Promotes wakefulness by blocking chemical receptors in your brain that would help you feel tired. Also increases urine production.	1. Avoid drinking caffeine within 9 hrs of bedtime. 2. Try to stay consistent with the amount consumed (avoid large increases).
Nicotine*	Promotes wakefulness by stimulating chemical receptors in your brain. Also increases awakenings and disrupts restorative phases of sleep.	1. Consider minimizing the amount used. The body can become tolerant to nicotine, but not its effects on sleep.
Food	Eating certain foods or large meals close to bedtime can cause disrupted sleep by altering body temperature, reducing release of melatonin (a chemical that makes you feel sleepy), and by disrupting restorative phases of sleep.	1. Avoid eating within 4 hours of bedtime, particularly foods that are high in sugar and other refined carbohydrates, as well as saturated fats. 2. If you do eat close to when you sleep, consider reducing the portion size. Also consider including foods high in fiber.
Light Exposure	Sends signals to the brain promoting wakefulness and reduces the release of melatonin.	1. Reduce light exposure in your bedroom close to bedtime (avoid screens and other light-emitting electronics, consider light blocking curtains or a sleep mask).
Exercise	Moderate to intense exercise has a positive effect on sleep . Exercise in the evening raises body temperature and prevents the release of melatonin.	1. Exercise daily. 2. Avoid exercising in the evening.

* With long term use, consider slowly reducing the amount consumed to avoid withdrawal effects, which can temporarily worsen sleep.

Common Treatable Health Conditions that can Impact Sleep

Obstructive sleep apnea (OSA)	Acid reflux (GERD)	Anxiety
Restless leg syndrome (RLS)	PTSD	Depression

(Baranwal et al., 2023; Gardiner et al., 2023; He et al., 2019; Irish et al., 2014; Sejbuk et al, 2022)

Appendix G

Letter of Site Support

Date: *07/02/2023* ***Project Champion***

This letter confirms that I [redacted] allows Scott Floyd (OHSU Doctor of Nursing Practice Student) access to complete his/her DNP Final Project at our site. The project date is yet to be determined but will most likely occur between July 2023 and September 2023.

This letter summarizes the core elements of the project proposal.

- **Project Site:** Tualatin Valley Fire and Rescue
- **Project Plan:**
  - Identified Clinical Problem: As a population, firefighters are exceptionally vulnerable to the adverse health effects of sleep deprivation due to the unique risk profile of the profession and associated lifestyle factors.
  - Rationale: It is well understood that sleep deprivation adversely impacts health and that attaining sufficient quality sleep is a key factor in promoting overall mental, physical, and emotional well-being. Literature on the topic demonstrates that delivering sleep health education to firefighters results in improved surrogate markers of well-being and sleep health. Literature further demonstrates that web-based content and in-person delivery are both effective methods of delivering sleep health content to firefighters so long as any training is brief and considerate of a firefighter's work obligations.
  - Specific Aims: Improve sleep health awareness and well-being in career firefighter populations.
  - Methods/Interventions/Measures: Sleep health educational content will be developed using evidence from the available knowledge of sleep health best practices and tailored to address lifestyle causes of impaired sleep within firefighter populations. This information will be condensed to an approximately one-page document promoting sleep health awareness and best practices, and then subsequently delivered to firefighters for review; exact numbers and locations yet to be determined pending further coordination and input from site. A pre and post survey will be conducted to assess self-rated knowledge in sleep health best practices to assess for improvement in knowledge as a result of the intervention. Additional response data will be collected to understand self-rated likelihood of sleep health behavior change based on the intervention.
  - Data Management: Anonymous survey data will be collected from participants by utilizing SurveyMonkey surveys. Data will be extracted to Excel for subsequent review and appropriate statistical analysis.
  - Site Support: The site will assist with determining optimal logistics for delivering sleep health education in the interest of minimizing impact to site operations.

During the project implementation and evaluation, Scott will provide regular updates and communicate any necessary changes to the Project Champion.

If I have any concerns related to this project, we will contact Scott Floyd and Jon Soffer (student's DNP Project Chairperson).

Regards,

DNP Project Preceptor Name: [redacted]
Job Title: [redacted] *Training Officer*
Email: [redacted]
Phone: [redacted]

Signature Date Signed

Appendix H

IRB Determination

OREGON HEALTH & SCIENCE UNIVERSITY

IRB MEMO

Research Integrity Office
3181 SW Sam Jackson Park Road - L106RI
Portland, OR 97239-3098
(503)494-7887 irb@ohsu.edu

NOT HUMAN RESEARCH

July 24, 2023

Dear Investigator:

On 7/24/2023, the IRB reviewed the following submission:

Title of Study:	Improving Sleep Health Awareness in Firefighters at a Local Fire and Rescue Company
Investigator:	Jonathan Soffer
IRB ID:	STUDY00026040
Funding:	None

The IRB determined that the proposed activity is not research involving human subjects. IRB review and approval is not required.

Certain changes to the research plan may affect this determination. Contact the IRB Office if your project changes and you have questions regarding the need for IRB oversight.

If this project involves the collection, use, or disclosure of Protected Health Information (PHI), you must comply with all applicable requirements under HIPAA. See the HIPAA and Research website and the Information Privacy and Security website for more information.

Sincerely,

The OHSU IRB Office