2020-R2-CX-0008

Identification and Mitigation of Robust Organizational Stressors and Mediators on Correctional Officer Health and Wellness

Principal Investigator: Christopher M. Kaipust, Ph.D., M.P.H.

Director, SHIELD Research Center

NDRI-USA, Inc.

1920 West 143rd Street, Suite #120, Leawood, KS 66224

Tel: 402-670-0183; Email: kaipust@ndri-usa.org

Award Recipient Organization:

NDRI-USA, Inc.

31 West 34th Street, 8th Floor # 8006, New York, NY 10010

Project Period: 01/01/2021-12/31/2022

Award Amount: $644,720

A. MAJOR GOALS AND OBJECTIVES

Objective 1: Explore and describe the primary organizational factors thought to impact behavioral, psychological and social aspects of health and safety among California COs through a synthesis of data from: a) in-depth semi-structured interviews with COs, administration, and organizational leadership about how leadership actions and interpersonal conflict drive negative health and outcomes; b) relevant data in the TWH literature; and c) findings from other occupational settings.

Objective 2: Based on data from COs and sworn staff from all of California's correctional institutions, identify the most robust organizational drivers and mechanism of negative behavioral, emotional, and physiological outcomes.

- **Objective 2a:** Develop general and generalized linear mixed models to identify a parsimonious set of organizational factors which predict CO outcomes using LASSO variable selection algorithms.
- **Objective 2b:** Based on the outcome of Aim 2a, develop models to examine the moderating effect of CO demographic and occupational characteristics.
- **Objective 2c:** Explore mechanisms of impact of individual factors on CO outcomes through statistical mediation analysis.

Objective 3: Using an expert panel, identify the most promising methods at the organizational and individual level to mitigate the impact of organizational factors discovered in Objective 2 and enhance CO well-being within a Total Worker Health® approach. Mitigation methods will include both recommended changes to the organization as well as interventions that target mechanisms of effect for organizational factors less amenable to change

B. RESEARCH DESIGN, METHODS, ANALYTICAL TECHNIQUES, AND OUTCOMES

B.1. Overview of Study Design. The proposed mixed-methods study used a Total Worker Health® (TWH) approach including formative and epidemiological survey methods to determine the drivers of organizational and administrative stressors on correctional officer (CO) behavioral, psychological, and physiological health, and underlying mechanisms. The evidence gathered was shared with an expert panel to identity the most promising methods at the organizational and individual level to mitigate the impact of organizational factors on CO stress.

B.2. SPECIFIC AIM 1

B.2.1. Specific Aim 1 Methods. The primary organizational factors thought to impact behavioral, psychological, and physiological aspects of health and safety among California COs were derived from in-depth semi-structured interviews with COs and supervisors. The interview data were analyzed via traditional qualitative approaches, as well as through topic modeling.

***Sampling for Key Informant Interviews*.** Semi-structured interviews were conducted with COs, administration, and organizational leadership to capture their perspectives on the primary organizational, administrative, and policy stressors. The California Correctional Peace Officers Association (CCPOA) assisted with recruitment of COs and supervisors. The CCPOA is the largest union for COs in California and serves all California Department of Corrections and Rehabilitation (CDCR) employees. Through their membership, we recruited a diverse sample of COs and supervisors. The sample was stratified by rank (CO vs supervisor), facility type (adult, juvenile), and CO/supervisor sex (male vs female). We anticipated recruiting 6 participants within each strata for interviews (N=48 total) to reach saturation.[1], [2]

Sampling of organizational leaders. We planned to interview 10 past and former elected leadership members of CCPOA, and leaders from relevant California corrections organizations. The CCPOA leadership team members are COs, giving them perspectives as COs and organizational leadership.

Methodology for Key Informant Interviews. Key informant interviews were conducted via telephone using a semi-structured guide. Participants were encouraged to share experiences in the form of narratives. Debrief interview sessions were conducted throughout the interview process for research team members to identify and troubleshoot issues. All audio from interviews were digitally recorded for transcription and reviewed by investigators to ensure interviewer fidelity.

COs and supervisors were asked to identify the most robust domains driving CO stress. General domains covered for COs included: a) leadership trust, support; b) management, policies, and procedures (real or perceived); c) input on decision making; d) performance evaluation, disciplinary processes; e) inadequate hiring and training of employees; f) pay and benefits; g) overtime and shiftwork; h) staffing and turnover; i) resources and equipment; j) interpersonal relationships with coworkers and supervisors; k) confidential services; l) covid-19. For supervisors, domains covered included the same as COs in addition to the following: a) challenges to supervisory positions; b) facility level resources available for COs and supervisors; c) challenges to implementing current and new policies and procedures; d) challenges to working with unions; e) challenges to working with other supervisory positions.

***Analysis for Key Information Interviews*.** Digital recordings were transcribed verbatim. The framework method for analysis approach[3] was originally planned to code and identify

recurrent themes, convergence of opinions and consensus on experiences of CO organizational and administrative stress from interviews. A thematic analysis approach of the semi-structured interviews was used in place of the framework method. NVivo software was used to analyze the data. Identified themes were synthesized with literature from corrections and other occupations, and fit into TWH domains to inform the comprehensive survey and toolkit.

Topic Modeling. An unsupervised machine learning approach called topic modeling was used to identify clusters of similar words within interview data. Traditional methods of thematic analyses involve researchers creating topics or themes using their own judgement to subjectively analyze qualitative data. Topic modeling uses machine learning techniques to automatically analyze text to create topics, which are terms that frequently occur together, usually on the same subject. This method is more objective as it is automated, with less human interpretation involved in analyzing the text. Topic Modeling was applied to the interview data after initial thematic codes were identified from the research team. This approach combines the benefits of traditional thematic analyses with the benefits of machine learning.

Cleaning and Preprocessing. The initial steps of topic modeling include the data cleaning and preprocessing phase, for which several key techniques were applied to enhance the quality and readability of the interview transcripts including stopword customization, contractions expansion, and lemmatization.

Topic Modeling Data Analysis. Nonnegative Matrix Factorization (NMF) was employed to uncover the overarching themes within the 14 interviews and understand the frequency with which specific words co-occurred. The NMF is a mathematical and computational method used in data analysis, particularly in the context of text and data mining. The NMF process involves

iteratively updating the basis and coefficient matrices until a satisfactory approximation of the original data is achieved. The basis matrix represents the discovered topics or themes, while the coefficient matrix captures how these topics or themes are expressed in each document or interview transcript.

B.2.2. Specific Aim 1 Changes in Approach from the Original Design

Recruitment. The study team experienced challenges in the recruitment of COs and supervisors. Recruitment of COs and supervisors was expanded in scope to include in-person recruitment at the annual CCPOA conference, direct recruitment of CCPOA job stewards, and online recruitment at the end of the online survey. CCPOA job stewards are union representatives at the facility level who work as correctional officers but represent the CCPOA for each member at their facility. We therefore considered them both as correctional officers and organizational leaders. **Scheduling/Conduct**. In addition to recruitment, we experienced challenges in scheduling interviews with correctional officers, as well as the conduct of interviews. We found mandatory overtime was a serious challenge to the scheduling and conduct of interviews. **Interview Guide Scope**. Given the large number of domains to be explored in interviews, we split the domain topics in half to create two semi-structured interview guides to be cognizant of the burden of time for participants. As potential participants signed up to be interviewed, we alternated the assignment of interview guides. **Analysis**. A thematic analysis approach of the semi-structured interviews was used in place of the framework method for ease of analysis due to fewer interviews completed than anticipated. Further, to strengthen the qualitative analysis an unsupervised machine learning approach called topic modeling was added to identify clusters of similar words within interview data.

B.2.3 Specific Aim 1 Results.

The specific aim 1 results are preliminary. Further analyses will proceed in order to answer the research questions, and for publication in both scientific journals as well as dissemination to correctional officers in collaboration with the CCPOA. There were 15 correctional officers or supervisors that completed an interview, with 14 agreeing to be recorded and eligible for thematic analysis and topic modeling. One coder has completed coding of all 14 transcripts and a second coder is in progress. The characteristics of correctional officers and supervisors are presented in Table 1. The majority of the sample were correctional officers that worked at an adult facility that housed male incarcerated individuals. The mean years of service in corrections was 16.7 years, most participants were male, and white.

TABLE 1: Interview Participant Characteristics from The California Corrections Workplace Climate Study

Characteristic	N (Percent)
Rank	
Officers	12 (85.7%)
Sergeant	1 (7.1%)
Lieutenant	1 (7.1%)
Facility type	
Adult	14 (100%)
Gender of inmates at facility	
Male	13 (92.9%)
Female	1 (7.1%)
Security level	
Level II	2 (14.3%)
Level III	5 (35.7%)
Level IV	7 (50.0%)
Ever worked in behavioral unit	
Currently	2 (14.3%)
Past	4 (28.6%)
Never	8 (57.1%)
Ethnicity	
Hispanic/Latine	4 (28.6%)
Race	
White	10
Black	2
American Indian/Alaskan native	2
Native Hawaiian/Pacific Islander	1
Other	1
Gender of Correctional Officers	
Male	9 (64.3%)
Female	5 (35.7%)
	Mean (SD)
Years of Service	16.7 (5.7)

The main themes identified across the interviews included: 1) management, supervisors, and policy; 2) staffing and overtime; 3) performance evaluation and discipline; 4) coping with job stressors; 5) mental health services.

Theme 1: Management, Supervisors, and Policy

Management with No Hands-On Experience	*"In my workplace and even before the workplace, it has to be with the upper management being out of touch with how to actually to do the regular people job. That's a big stressor. I've always called it, whether it's a corporation or not, they come in and they want to change how things are done without actually knowing the job."* *"…they've came up through the counselor ranks, or they became a manager from another career path, so they have no actual hands-on experience doin' the job, and they're judging the way we do our job, so that's frustrating."*
Policy Disconnect	*"Even if our warden thinks it's a bad policy or whatever, he has to enforce it or run the risk of losing his job. We just show up and we do what we're told. That's another thing that causes stress is because even if you know this isn't gonna work, you could still potentially get in trouble because somebody's gotta be at fault, which is why policies need to have more input placed into 'em, maybe from CCPOA or from the local level."*
Policy Shortcut	*"They want you to follow procedures, but when you follow procedures and it takes more time to do it the right way, then they want you, "Oh, well do this, do it this way, go against policy a little." without telling you to go against policy. Then when something happens, you're looking at an adverse action being in trouble with either getting written up or losing a percentage of your pay. You're damned if you do, you're damned if you don't. They don't say, "Take shortcuts," but they want you to take shortcuts to get the program out, to get the inmates—the program for the day. If you did it by policy and procedures, you would be half the day probably feeding the inmates"*

The first theme to emerge in the interviews was management, supervisors, and policy. Specifically, the participants described challenges of working for management with no hands-on experience working as a correctional officer. Further, a second subtheme emerged where correctional officers described a disconnect in policy written by CDCR headquarters and its implementation in each facility. As such, the third subtheme was about policy shortcuts. The challenges in implementing the policies as written led to shortcuts being taken to achieve the end goals.

Theme 2: Staffing and Forced Overtime

Understaffed	*"Because we're so short-staffed that we can't even do our own jobs, let alone everything that needs to be done on a daily basis. The short staff is the main, main issue. People are getting tired. People are getting tired. Some of my coworkers that have been there for more than 15 years, they say that this is the worst that it's ever been. Ever."*
Forced Overtime	*"Let me tell you about right—let me tell you about right now what's causing a lot of stress, especially for the COs—especially for the COs—we're so short-staffed that they're getting ordered over two to three times a week"*
Family Life Impact	*"You don't pay me enough to miss my kid's birthday or whatever or an anniversary or a holiday. I could care less. Keep the money. Keep whatever. Yeah. That definitely plays a big role. We know what we signed up for. We knew that that was always a possibility. It doesn't mean that it doesn't suck when it happens."*
Exhaustion	*"When you have officers who are sleep deprived and stressed, then you are going to get the bad outcomes you're gonna turn around and discipline them for. There just has to be a way to stop that cycle."*

The second theme to emerge from interviews was the issue of staffing and forced overtime, with subthemes including being understaffed, forced overtime, the negative impact of overtime on family life, and exhaustion. Some participants described staffing as the worst it's ever been, requiring forced overtime multiple times a week, which negatively impacts time spent with family, and results in exhaustion due to shortened opportunities for sleep.

Theme 3: Performance Evaluation and Discipline

Extra Footage	*"They have not figured out how to cut that piece out and store it. Right now, they're having to store everything and that's not what the agreement was with correctional officers' union."*
Comradery	"Yeah, because partner may be having a bad day and I can pull him in or talk to him, say, "Hey, what's going on?" Right now he'd be probably free to tell me, but when the cameras come on, he's not gonna tell me what's wrong. I'm thinking that's gonna even screw with more people's mental side of 'em."

The third theme to emerge from interviews was performance evaluation and discipline, specifically around the implementation of body cameras in facilities. This was not a planned domain, it emerged in open dialogue about performance evaluation. Correctional officers expressed concerns about CDCR reviewing footage for longer than the designated agreed upon time period, as well as hindering comradery due to correctional officer concerns about being able to talk openly to coworkers when body cameras are running.

Theme 4: Coping with Job Stressors

Leave it at the Gates	*"I finally kinda learned to let it go, and just—if somebody assaulted me today, I'd be probably very mad for a while, but for the most part, the daily stuff that we do, I'm able to just shut it off when I drive through the gate. Okay, that day's done. I'm not gonna let it affect me. I think a lot of that was me making that decision to not let it bother me anymore."*
Impact of Not Coping	
Cynicism	*"…but if you don't have somebody who doesn't have those things, I can easily see where this career field can wear you down. It makes you cynical. It can make you angry at the world. It can make you very upset"*
Consuming	*"I started looking for activities that were positive because what I've noticed is that I was turning into a negative person because of everything that was goin' on at work, and it kinda wears off…I felt like that was consuming me sometimes."*
Walking Incidents	*"It's just that a lot of people are—they're balloons. You don't know when they're gonna pop. That, accompanied with the involuntary overtime, and there's stressors and just different aspects of the job. I'm sad to say that there's a lot of people that are walking incidents. Between that, and then, coming home and then having to deal with your spouse sometimes. You have to explain to them why you got ordered over again and again."*

The fourth theme to emerge from interviews included the need to cope with stressors by mentally leaving what can be left at gate of the prison, and the impact of not coping.

Specifically, correctional officers talked about how over time they learned to better leave more of their stress at work when going home, and finding a way to release the stress once home. Further, officers described the impact of poor coping mechanisms including making people cynical, with the stress consuming them until they become an incident waiting to happen.

Theme 5: Mental Health Services

Access	*"We have wellness, but even if we try to call EAP for help, I've talked to so many staff where they can't even get in to see a therapist"*
Effectiveness	*"The EAP program, you call them, and it might take three or four times for you to get ahold of—to be assigned a counselor or to have someone to talk to. Then that person might not be all that engaged in the process, so to speak. A lotta people feel like the EAP program also is useless. Then the side from that, there's just nothin'."*

The final theme to emerge was around access to mental health services. Correctional officers described challenges with the access to and effectiveness of the Employee Assistance Program.

Topic Modeling Results. The Nonnegative Matrix Factorization ((NMF) technique was used to select 10 topics, each with 15 words as a default choice, aiming for an initial exploration of the overall themes present in the interviews. The outcomes for each topic are detailed below.

Topics for Interview Transcripts in NMF Model:

Topic #1: prison job need feel somebody use everything make mean force cause everybody hour cannot got
Topic #2: institution need policy talk cause stuff program maybe getting prison wanna academy support women tell
Topic #3: institution job feel make position someone need cause stressful us everyone cdcr cannot new done
Topic #4: guy yard female department need make fight class institution mean health unit training speak mental health
Topic #5: training inside place individual personally try career number deal away years big institution program either
Topic #6: lot people used got need department hour job working short know know feed example pretty tell tired
Topic #7: prison institution things kind somebody mask frustrating sometimes let make job hard got tell talk
Topic #8: stuff sometimes institution part custody level started feel make different believe hour communication department management
Topic #9: prison stressor need facility feel co cos talk cannot job run able certain different especially
Topic #10: feel supervisor job regard department stuff process policy pay care got try level warden trying

We inspected the top keyword results and explored the general themes associated with each topic. Examples of the three topics are presented here are as follows:

Theme 1: Constraints and Pressures of Correctional Work (Topic 1)

This theme captured the sentiment of officers feeling the need to meet various demands and expectations within the prison system, possibly under tight restrictions or with limited resources. The mention of "need," "feel," "use," and "make" suggests a focus on the personal experience and agency within the job. "Somebody," "everything," "everybody" might indicate a sense of collective experience or collective responsibility. The words "force," "cause," and "cannot" could imply feelings of compulsion or lack of choice in certain actions, while "hour" might relate to the time pressures they face. "Got" could reflect a sense of resignation or acceptance of the situation. The overall theme indicates a complex interplay of personal and systemic factors that contribute to the stress experienced by correctional officers in the California corrections system.

Theme 2: Institutional Demands and Personal Impact in Corrections Work (Topic 3)

This theme explored the interplay between the institutional demands of the job and the personal feelings and reactions of the officers. The words "institution," "job," "position," and "CDCR" (California Department of Corrections and Rehabilitation) indicate a focus on the structural and organizational aspects of their work. The frequent appearance of words like "feel," "make," "someone," "us," and "everyone" points to the personal and collective experiences of stress. "Need," "cause," "stressful," and "cannot" may reflect the perceived reasons behind the stress and the perceived lack of control or ability to change the stressful circumstances. "New" and "done" could imply issues related to the adaptation to new policies

or the completion of tasks within the institutional framework. The overarching theme is likely to concern how institutional structures and requirements impose stress on correctional officers, affecting both their professional duties and personal well-being.

Theme 3: Navigating Institutional Complexity and Custodial Responsibilities (Topic 8)

This theme reflected the multifaceted nature of correctional work and the challenges of communication and management within the institutional setting. "Stuff" and "sometimes" hint at the unpredictable and varied nature of the job. "Institution" and "department" relate to the broader organizational context. "Part," "custody," and "level" suggest different aspects or tiers of the correctional environment that officers engage with.

The use of "started" could indicate the beginning of careers or initiatives within the institution, while "feel," "make," and "different" imply the emotional and psychological impact of the job and the changes or differences officers encounter. "Believe" and "communication" point to the importance of perceptions and interactions in managing relationships and information within the department.

"Hour" might signify the time-related pressures or experiences, and "management" likely refers to the role of administrative structures and the challenges associated with them. The overall theme suggests an exploration of how correctional officers start, adapt, and navigate the complexities of their roles within the correctional institution, including dealing with different levels of custody, varying duties, and the necessity of effective communication.

B.2.4. Limitations to Aim 1 Results

The limitations to the interviews included a low response rate. The correctional staff who did participate did express concern over retaliation from the CDCR for talking about

organizational issues, which we believe contributed to the low response rate. We utilized two different versions of interview guides in order to cover more topics, and given the lower response rate we may not have reached saturation on every domain. However, the semi-structured interviews started with the open-ended question, “What organizational and administrative stressors would you say most impact your stress, health, and wellness?” Therefore, correctional officers often freely discussed the factors most impacting their health, with specific probes as the interview continued. Further, we were unable to recruit as many supervisors as we planned, and as many staff as juvenile facilities as we planned. Therefore, the results of the interview primarily generalize to correctional officers working in adult facilities in California.

B.3. SPECIFIC AIM 2

B.3.1. Specific Aim 2 Methods. A statewide online survey of California COs was conducted to identify the most robust organizational drivers and mechanisms of poor behavioral, psychological, and physiological health outcomes. The moderating effect of CO characteristics and the individual factors thought to mediate the association between organizational factors and poor health outcomes were also explored.

***Sampling and Recruitment for Survey*.** The sampling and recruitment occurred among the CCPOA membership. The CCPOA is the largest organization of COs in the USA with more than 30,000 members of active and retired correctional staff. Solicitation was originally conducted through their website and email distribution list. The solicitation included a short description of the survey and a link as well as QR code to the online survey hosted by the

Qualtrics platform. The first page of the survey was the informed consent page, and retired COs were screened out of the survey.

Method and Measures for Survey

***Survey Measures*.** A carefully selected group of measures was used to capture data in four broad domains. First, two sets of variables provided data on the **individual characteristics of COs**, including demographic and occupational variables (e.g., years of service, rank, etc.). Next, **individual CO outcomes** included measures of behavioral, psychological, and physiological health. Third, a set of **potential individual CO mediators** of relationships between organizational characteristics and individual CO outcomes was measured. Lastly, **organizational factors** and **institutional characteristics** were measured. The organizational factors included in the survey were informed by Aim 1 interviews, literature, and feedback from the CCPOA. Table 2 provides a summary of the measures on the online survey.

Table 2: Survey Domains for The California Corrections Workplace Climate Study

Domain	Sub-Domain	Measure
Individual CO Factors	Occupational Factors	Rank Custody Position Facility Type Sex of Inmate Population Security Level Behavioral Health Unit Years Worked Facility Name
	Demographics	Age Ethnicity Race Sex Gender Sexual Orientation Education Income Marital Status Self-Report Height Self-Report Weight General Health

Table 2: Survey Domains for The California Corrections Workplace Climate Study (continued)		
Domain	**Sub-Domain**	**Measure**
CO Outcomes	Psychological	Depression & Anxiety: PHQ-4 [7] PTSD: Abbreviated PCL-C [8], [9]
	Physiological	Somatic Symptoms: SSS-8 [11]
	Behavioral	Absenteeism & Presenteeism: WHO HWP[4] Alcohol Use: NHSDA/BRFSS [5] Physical Activity: SRPA [6]
Individual Mediators[1,2]	Coping[1]	Brief-COPE [12], [13]
	Job Satisfaction[1]	MOAQ-JSS [14]
	Burnout[2]	Oldenburg Burnout Inventory [15]
	Sleep[1,2]	Brief Pittsburgh Sleep Quality Index [16]
	Turnover Intent[2]	Turnover Intent [17]
	Recovery Experience[2]	Recovery Experience Questionnaire [18]
	Work-Family Conflict[1]	Time-Based Work-Family Conflict [19]–[21] Strain-Based Work-Family Conflict [19]–[21]
Organizational Factors	Stressors Intrinsic to the Job	Shift Schedule [22] Overtime & Overwork [22] [23] Training Effectiveness [24] Perceived Danger [27] Staffing [26]
	Role Problems	Role/Work Overload [23], [25]
	Support Relationships at Work	Quality of Supervisor Support [28] Coworker Support [28]
	Org Structure and Justice	Organizational Support [28] Administrative Strengths [24] Organizational Justice [17]
Confidentiality of Services	Mental Health Services	Utilization [29] EAP Concerns [29] Reasons for Concerns [29]
[1,2]Individual mediators were grouped into two sets, and participants randomly received either set 1 or set 2. Sleep was in both sets.		

General Approach to Analysis for Survey Data

***Pre-processing*.** Prior to statistical modeling, exploratory data analysis (EDA) was conducted to examine variable distributions and to visualize potential relationships between independent and dependent variables. EDA and data visualization was conducted with the STATA and R statistical packages. The results presented in this report are from the EDA. Further advanced analyses detailed below are in progress.

***Aim 2a*.** General and generalized linear mixed models will be developed to identify a parsimonious set of organizational factors which predict CO outcomes using a LASSO variable selection algorithm within the R-package 'glmmlasso'.[30] Each model will include a random effect for the assigned correctional facility of each participant to control for clustering effects. Models will be developed for each of the CO outcomes and the identified set of organization predictor variables will be compared across domains. Standard linear model diagnostics will be conducted, including residual analysis.

***Aim 2b*:** Based on the recommendations of Schelldorfer and colleagues,[31] linear mixed effects models developed in Aim 2a will be refit by maximum likelihood estimation. Next, potential individual demographic and occupational moderators of the relationship between organizational factors and CO outcomes will be tested and significant covariates will be retained in the final models.

***Aim 2c*:** Mediation analyses will be conducted using the R-package mediate.[32] Exploratory and graphical methods will be used to examine the magnitude of change in each candidate mediator with changes in organizational factors for each CO outcome domain. The mediate package allows the analysis of causally dependent multiple mechanisms, even then the mechanisms are not causally independent, through its multimed function. Multiple mediators of different types can be considered simultaneously, and the indirect effects carried by individual mediators can be separated from the total effect.

B.3.2. Specific Aim 2 Changes in Approach from the Original Design

Recruitment. The study team experienced challenges in the recruitment of COs and supervisors similar to the challenges experienced in recruiting for aim one interviews.

Recruitment of COs and supervisors was expanded in scope to include in-person recruitment at the annual CCPOA conference, in addition to the planned recruitment via CCPOA members only website and social media. Further, we expanded recruitment by sending three emails and two postcards to every CCPOA union member to recruit for the survey which greatly improved survey participation. **Survey Scope.** Given the large number of domains to be explored on the survey, we split the individual mediators into two sets of measures, which participants were randomly assigned to receiving. This allowed the estimated survey completion time to be near 30 minutes to reduce participant burden.

B.3.3. Specific Aim 2 Results

All survey results presented in this report are preliminary exploratory data analysis. The online survey had 917 potential participants open the survey, and 849 potential participants (93%) provide consent to participate and respond to the first survey question about rank. More potential participants responded to the postcard solicitation (57%) than the email, social media, and website solicitations (43%). Of the 849 participants providing consent and answering the rank question, 204 indicated they did not currently work for CDCR or were retired, were ranks that were not correctional officers including parole officers and correctional counselors, and were declared ineligible. This left 645 eligible for analyses, with 452 participants (78%) answering the final question of the survey. The participant demographics are presented in Table 3. The majority of eligible survey respondents were correctional officers working in adult male facilities, and nearly half worked in Level IV facilities. Approximately 84% of survey respondents were male, 47% were Hispanic/Latine, 56% had some college or technical school, and the mean years of service was 13 years.

TABLE 3: Survey Participant Characteristics from The California Corrections Workplace Climate Study (n=626)

Characteristic	N (Percent)
Rank	
Officers	554 (85.9%)
Sergeant	49 (7.6%)
Lieutenant	27 (4.2%)
Captain	11 (1.7%)
Associate Warden & higher	4 (0.6%)
Facility type	
Adult	638 (99.7%)
Gender of inmates at facility	
Male	605 (94.4%)
Security level	
Level I	10 (1.6%)
Level II	156 (24.3%)
Level III	170 (26.5%)
Level IV	306 (47.7%)
Ever worked in behavioral unit	
Currently	109 (17.0%)
Past	245 (38.1%)
Never	289 (45.0%)
Ethnicity	
Hispanic/Latine	291 (46.8%)
Race (select one)	
White	339 (58.8%)
Native Hawaiian/Pacific Islander	13 (2.3%)
Asian	37 (6.4%)
Black/African American	28 (4.9%)
American Indian/Alaskan Native	14 (2.4%)
Other	146 (25.3%)
Gender of Correctional Officers	
Male	499 (83.7%)
Female	89 (14.7%)
I used a different term	4 (0.7%)
Don't know/prefer not to answer	15 (2.5%)
Education	
High school graduate or less	119 (19.5%)
Some college or technical school	343 (56.3%)
College graduate	123 (20.2%)
Advanced degree	24 (3.9%)
	Mean (SD)
Years of Service	12.7 (7.7)

The physical, psychological, and physiological health of survey respondents is presented below in Table 4. Approximately 58% of survey participants were obese, 35% were overweight, totaling 93% of participants as overweight or obese. The prevalence of screening positive for mental health disorders was high: 46% for PTSD, 38% for anxiety disorder, and 23% for depressive disorder. Nearly half of participants experienced high or very high somatic symptoms in the past 7 days.

TABLE 4: Survey Participant Physical, Mental, & Physiological Health from The California Corrections Workplace Climate Study

Characteristic	N (Percent)
Body Mass Index	
Normal	44 (7.4%)
Overweight	210 (35.2%)
Obese Class I	187 (31.3%)
Obese Class II	100 (16.8%)
Obese Class III	56 (9.4%)
PTSD	
Screened Positive	249 (45.9%)
Anxiety Disorder	
Screened Positive	220 (37.7%)
Depressive Disorder	
Screened Positive	133 (23.2%)
Somatic Symptoms	
Minimal	50 (9.9%)
Low	105 (20.8%)
Medium	105 (20.8%)
High	88 (17.4%)
Very High	158 (31.2%)

The behavioral health of survey participants is presented in Table 5. Approximately 58% of participants participated in vigorous physical activity in the past 7 days. The majority (73%) of participants drank at least one alcohol beverage in the past 30 days. Participants reported an average of 4 drinks on a drinking occasion, 3.5 binge drinking occasions in the past 30 days, and the average highest number of drinks in a drinking occasion was 6 drinks. The mean relative

absenteeism score was 0.4%, indicating a balance between working more than expected and always being absent. The mean relative presenteeism score was 130%, indicating the respondents believed their performance was 130% better than other worker's performance at the same job.

TABLE 5: Survey Participant Behavioral Health from The California Corrections Workplace Climate Study

Characteristic	N (Percent)
Physical Activity	
Avoid Physical Activity	
Avoid walking or exertion	54 (10.7%)
Walk for pleasure	91 (18.0%)
Moderate Physical Activity	
10-60 minutes per week	31 (6.1%)
Over one hour per week	36 (7.1%)
Vigorous Physical Activity	
Run <1 mile per week or <30 mins	140 (27.6%)
Run 1-5 miles per week or 30-60 mins	64 (12.6%)
Run 5-10 miles per week or 1-3 hours	42 (8.3%)
Run >10 miles per week or >3 hours	49 (9.7%)
Alcohol Use in Past 30 Days	
≥1 alcoholic beverage	376 (72.5%)
	Mean (SD)
# of drinks on drinking occasion	4.0 (4.1)
#of times binge drinking	3.5 (6.0)
Highest # of drinks on drinking occasion	5.9 (4.3)
Absenteeism	
Relative Absenteeism	0.0 (0.7)
Presenteeism	
Relative Presenteeism	1.3 (0.4)

Selected organizational factors are presented in Table 6. More than 63% of participants disagreed or strongly disagreed with the statement that there was enough staffing to maintain the safety and security of the facility, and the mean number of overtime hours in the past week was 11 hours. For role overload, 64% of respondents agreed or strongly agreed that they were assigned an unmanageable number of assignments or prisoners. The mean score on the quality

of work was 13, with a possible range of 1-20 summed across five items with 4-point scales of strongly disagree to strongly agree, indicating the participants were able to maintain the quality of their work reasonably. The quality of coworker support was high (mean: 22; possible range: 6-30; 6 items; 5-point scale strongly disagree to strongly agree), and quality of supervision (mean: 22; possible range: 7-35; 7 items; 5-point scale strongly disagree to strongly agree) was moderate. However, organizational support (mean: 6; possible range: 3-15; 3 items; 5-point scale strongly disagree to strongly agree) was very low. Further, the perception of administrators was low (mean: 33; possible range: 7-70; 10 items; 7-points scale strongly disagree to strongly agree), and distributive justice (mean: 12; possible range: 5-25; 5 items; 5-point scale very unfair to very fair) was very low. This suggests correctional officers rate the function of the administration poorly, and the practices of the organization are unfair.

TABLE 6: ORGANIZATIONAL FACTORS FROM THE CALIFORNIA CORRECTIONS WORKPLACE CLIMATE STUDY

CHARACTERISTIC	N (Percent)
ENOUGH STAFFING TO MAINTAIN FACILITY SECURITY	35 (7.0%)
STRONGLY AGREE	67 (13.5%)
AGREE	81 (16.7%)
NEUTRAL	124 (24.9%)
DISAGREE	191 (38.4%)
STRONGLY DISAGREE	
ROLE OVERLOAD	
UNMANAGEABLE # OF ASSIGNMENTS/PRISONERS	153 (30.8%)
STRONGLY AGREE	167 (33.6%)
AGREE	155 (31.2%)
DISAGREE	22 (4.4%)
STRONGLY DISAGREE	
	Mean (SD)
OVERTIME	
HOURS OF OVERTIME PER WEEK	11.3 (12.4)
ROLE OVERLOAD	
QUALITY OF WORK	13.3 (3.3)
QUALITY OF SUPPORT	

QUALITY OF SUPERVISION	22.4 (6.5)
COWORKER SUPPORT	22.2 (4.2)
ORGANIZATIONAL SUPPORT	5.8 (2.5)

TABLE 6: Organizational Factors from The California Corrections Workplace Climate Study (cont'd)

Characteristic	**N (Percent)**
ADMINISTRATION	
ADMINISTRATIVE STRENGTH	32.7 (10.8)
DISTRIBUTIVE JUSTICE	12.2 (5.4)

Selected individual mediators are presented in Table 7. All 14 coping styles are presented below with each style assessed via 2 questions rated on a frequency scale from 1 (don't do this at all) to 4 (do this a lot). The average score for each coping style is presented in ranked order of highest mean score to lowest, with acceptance, religion, and self-blame at the top. The mean overall score for burnout was 46, with a possible score range of 16-64, suggesting burnout is elevated among participants. The two scales of work-family conflict had mean scores near the middle of the possible ranges (time-based mean: 15; possible range: 5-25; five items; 5-point scale from strongly agree to strongly disagree) (strain-based mean: 31; possible range: 10-50; ten items; 5-point scale from strongly agree to strongly disagree).

TABLE 7: INDIVIDUAL MEDIATORS FROM THE CALIFORNIA CORRECTIONS WORKPLACE CLIMATE STUDY

CHARACTERISTIC	**Mean (SD)**
BURNOUT	
DISENGAGEMENT	23.5 (3.8)
EXHAUSTION	22.5 (4.0)
COMBINED SCORE	46.0 (7.1)
COPING STYLE	
ACCEPTANCE	4.9 (1.9)
RELIGION	4.9 (1.9)
SELF-BLAME	4.9 (1.9)
SELF-DISTRACTION	4.8 (1.5)
ACTIVE COPING	4.7 (1.7)
HUMOR	4.7 (2.0)
PLANNING	4.4 (1.8)
POSITIVE REFRAMING	4.1 (1.6)
VENTING	4.0 (1.6)
USE OF EMOTIONAL SUPPORT	3.7 (1.6)

USE OF INSTRUMENTAL SUPPORT	3.6 (1.6)
BEHAVIORAL DISENGAGEMENT	3.2 (1.6)
DENIAL	3.2 (1.5)
SUBSTANCE USE	3.0 (1.6)

TABLE 7: Individual Mediators from The California Corrections Workplace Climate Study (continued)

Characteristic	**Mean (SD)**
WORK-FAMILY CONFLICT	
TIME-BASED CONFLICT	15.3 (5.0)
STRAIN-BASED CONFLICT	31.2 (8.7)

Mental health service utilization and concerns were reported by participants. Approximately 25% had accessed the Employee Assistance Program and 15% had accessed mental health services outside the EAP and CDCR. Participants were asked if they had concerns in accessing EAP services if they felt they were needed, and 23% responded affirmatively. Of those who had concerns, participants were asked to select all concerns that apply: 64% stated concerns over confidentiality, 58% stated concerns over potential negative impact on one's career, 40% stated concerns over negative coworker perceptions, 39% stated they were unsure how to access services, and 18% stated concerns over cost of services.

Advanced Analyses

More advanced data analysis techniques including general and generalized linear mixed models to identify a parsimonious set of organizational factors which predict CO outcomes using LASSO variable selection algorithms, models examining moderating effects, as well as mediation analyses will be conducted with results published in the scientific literature, and disseminated via the CCPOA.

B.3.4. Limitations to Survey Results

The limitations to the online survey also include a lower than anticipated response rate. We grouped the potential mediators into two sets of measures, and randomized the

respondents to receiving one set of the mediators. Therefore, our response rate to the each of the sets of questions is lower than anticipated. This is a cross-sectional study design, therefore the challenges with temporality apply to the results of this survey. The online survey solicitation focused on the aspects of the job that impacted health and wellness, with a focus on providing a research base to improve CDCR policies, practices, and programs. It is possible that correctional staff that had experienced challenges with their job, and/or with the health were more likely to respond. However, previous research has identified organizational stressors as a major source of stress for correctional staff[38]–[40], contributing to poor mental and physical health[38].

B.4. SPECIFIC AIM 3

B.4.1. Specific Aim 3 Methods.

Based on the results from aims one and two, we synthesized the results to identify the most robust organizational drivers and mechanisms of behavioral, psychological, and physiological impacts on CO health and safety. We conducted a stakeholder meeting with an expert panel of COs, CCPOA directors, and CCPOA board members to synthesize results and develop a toolkit. The developed final product will include a toolkit for correctional facilities to tailor their own workplace program, policies, and practices to protect from behavioral, psychological and physiological impacts of organizational and administrative stressors while enhancing CO well-being. The toolkit will include a report on the results of objectives one and two in comprehendible format. The toolkit may also include sample policies, programs, and

practices; checklists, worksheets and resources to tailor to best fit their institution; and planning, implementation, and evaluation resources.

Suggested methods for mitigation will be framed at all levels of the Hierarchy of TWH Controls[33] using evidence from objectives one and two. Using a TWH approach will allow correctional facilities to feel empowered to change the workplace health and safety environment for COs. The toolkit will allow facilities to tailor the policies, programs, and resources to best fit their institution based on evidence-based data. This approach will allow each institute to evaluate the effectiveness of their newly tailored programs, policies, and practices based on their own criteria and for a future grant to evaluate the effectiveness of the toolkit.

B.4.2. Specific Aim 3 Changes in Approach from the Original Design

Toolkit Development. No new resources were developed beyond research interview and survey result based reports and presentations. The Principal Investigator identified the *Healthy Workplace Participatory Program* (HWPP) developed by the Center for the Promotion of Health in the New England Workplace (CPH-NEW) as a comprehensive program for utilizing a Total Worker Health® approach among correctional officers. The program was developed and utilized among correctional officers on the east coast. Therefore, at the stakeholder meeting we presented the HWPP, and practiced the first two steps of the IDEAS process, to get a feel for usability, feasibility, and satisfaction for use in CDCR settings, and a future research application.

B.4.3. Specific Aim 3 Results.

A single day stakeholder meeting was conducted with 10 correctional staff representing 8 different facilities and numerous CCPOA leadership. The expert panel of COs were chosen by

the CCPOA to provide a voice to correctional officers in identifying organizational and individual level factors contributing to poor health and safety, as well as promising methods at the organizational and individual level to mitigate the most robust organizational drivers and mechanisms and enhance CO well-being using a TWH approach. The day was formatted around the Healthy Workplace Participatory Program. We utilized the formative interviews and online survey as the workforce assessment. The 10 correctional staff were considered the Design Team. The Principal Investigator acted as the facilitator for the day. The research team presented the preliminary results of the interviews and survey to the Design Team in the morning. A lively, active discussion occurred throughout the presentation of the results. This discussion included conversations between the correctional staff and the research team about perceptions of the results and causes of the issues presented, as well as between the correctional staff and the CCPOA leadership about how the CCPOA advocates to the CDCR in addressing these issues and what can be further done.

The afternoon was similarly structured around the Healthy Workplace Participatory Program. In particular, condensed versions of Design Team Start-Up meetings 1-3, as well as IDEAS Step 1 and 2 were piloted among this group. The research team presented an overview of Total Worker Health®, and an overview of the Healthy Workplace Participatory program. The Design Team then decided upon a health and safety priority to address. Next, the design team conducted a root cause analysis using the Fishbone approach to identify the root causes and contributing factors of the health and safety issue they had selected. After step one was complete, the design team moved onto step two. They developed a measurable objective, as well as a list of solutions to the root causes and solution activities to the contributing factors.

After completion of the Design Team startup meetings and IDEAS Steps 1 and 2, the research team led a debrief session for feedback from the participating correctional staff on the Design Team and the CCPOA leadership who observed the activities. Feedback was very positive, with correctional officers expressing they felt like they finally had a voice, and they were feeling hope for the next generation of correctional officers to not have to face the environment they've endured throughout their careers. They wished this work had started a decade ago. The concerns they expressed were about individuals on facility Steering Committee's stonewalling efforts, individuals not fit for this type of work being place on Design Teams or Steering Committees, and concerns over CDCR hesitation to implement suggestions. A discussion over solutions to expressed concerns ensued. The research team expressed gratitude to the correctional staff for their very active participation and to the CCPOA for the efforts throughout the grant and this stakeholder meeting.

C. PARTICIPANTS AND OTHER COLLABORATING ORGANIZATIONS

All research participants were currently employed as correctional officers in the California Department of Corrections and Rehabilitation. The California Correctional Peace Officers Association, the corrections officers' labor union in California, was a collaborating organization for the research project.

D. EXPECTED APPLICABILITY OF THE RESEARCH

This research project aimed to fill gaps in research to understand the behavioral, psychological, and physiological impacts of organizational and administrative stressors, and their

mechanisms. This research project was also the first to attempt to identify the most robust of those organizational stressors using quantitative and qualitative data. The data on organizational stressors, their impacts on health and safety, and their mechanisms were used to create a toolkit of resources for prison institutions to tailor policies, programs, and practices to protect against organizational and administrative stressors and enhance CO health. An evidence-based TWH approach has been under-utilized in the correctional workforce.[34], [35] No approach or theory better fits the unique demands, stressors, and health outcomes than TWH. This project provided valid data and a toolkit of resources to evaluate as an evidence-based intervention in a future grant. The CDCR was the ideal occupational population to conduct this study. California employs the second largest number of COs in the US with over 36,000 employees[36], and has the second largest imprisoned population nationally.[37]

E. ARTIFACTS

E.1. Products.

- Qualitative Interview Transcripts to be submitted to the National Archive of Criminal Justice Data (NACJD) within the Inter-university Consortium for Political and Social Research (ICPSR).
- Quantitative Survey Dataset to be submitted to the National Archive of Criminal Justice Data (NACJD) within the Inter-university Consortium for Political and Social Research (ICPSR).
- White paper and infographics to be distributed by the CCPOA and posted on the NDRI-USA website when complete.

- Manuscripts to be submitted to peer-reviewed journals focusing on correctional officers/law enforcement or occupational health and safety journals.

E.2. Data Sets Generated. *Qualitative.* Transcripts collected from the 14 semi-structured interviews on organizational stressors were saved in Microsoft Word and analyzed via NVivo. *Quantitative*. Survey data collected from the 645 consented and eligible correctional officers for analyses participants via the Qualtrics survey platform was generated in CSV and Excel files, and analyzed in STATA and R.

E.3. Dissemination Activities. *Toolkit Products*. The NDRI-USA team is currently working with the CCPOA to disseminate the results of the study. The products will likely include a white paper, as well as fact sheets/infographics. In addition to resources, the toolkit will include resources like the Healthy Workplace Participatory Program, and educational materials on Total Worker Health®.

Presentations. The results of the study were presented in-person at the stakeholder meeting to correctional officers, the CCPOA Director of Health, and other CCPOA leadership roles including the legislative office. The results were separately presented in-person to the Director of the CDCR Office of Employee Wellness, where next steps and collaboration were discussed as well. Preliminary results were also presented at the Northwest Leadership Seminar, a public safety leadership conference in the Pacific Northwest. The importance of participating in research, and solicitation for the current study, was presented at the annual CCPOA conference.

*Legislative Act*ion. The CCPOA used preliminary results from this study in legislative testimony on the current staffing crisis in corrections, and the impact on correctional officer health and safety.

Peer Reviewed Publications. The NDRI-USA team will publish qualitative and quantitative journal articles in scientific peer-reviewed journals that focus primarily on COs/law enforcement after advanced analyses are completed.

F. REFERENCES

[1] G. Guest, A. Bunce, and L. Johnson, "How Many Interviews Are Enough? An Experiment with Data Saturation and Variability," *Field Methods*, vol. 18, no. 1, pp. 59–82, Feb. 2006, doi: 10.1177/1525822X05279903.

[2] D. L. Morgan, *The Focus Group Guidebook*, 1st ed. SAGE Publications, Inc, 1997.

[3] N. K. Gale, G. Heath, E. Cameron, S. Rashid, and S. Redwood, "Using the framework method for the analysis of qualitative data in multi-disciplinary health research," *BMC medical research methodology*, vol. 13, no. 1, p. 117, 2013.

[4] R. C. Kessler *et al.*, "Using the World Health Organization Health and Work Performance Questionnaire (HPQ) to evaluate the indirect workplace costs of illness," *Journal of Occupational and Environmental Medicine*, vol. 46, no. 6, pp. S23–S37, 2004.

[5] C. K. Haddock *et al.*, "Alcohol use among firefighters in the Central United States.," *Occup Med (Lond)*, vol. 62, no. 8, pp. 661–664, Dec. 2012, doi: 10.1093/occmed/kqs162.

[6] A. S. Jackson, S. N. Blair, M. T. Mahar, L. T. Wier, R. M. Ross, and J. E. Stuteville, "Prediction of functional aerobic capacity without exercise testing," *Med Sci Sports Exerc*, vol. 22, no. 6, pp. 863–70, 1990.

[7] K. Kroenke, R. L. Spitzer, J. B. Williams, and B. Löwe, "An ultra-brief screening scale for anxiety and depression: the PHQ–4," *Psychosomatics*, vol. 50, no. 6, pp. 613–621, 2009.

[8] A. J. Lang and M. B. Stein, "An abbreviated PTSD checklist for use as a screening instrument in primary care," *Behaviour research and therapy*, vol. 43, no. 5, pp. 585–594, 2005.

[9] F. W. Weathers, B. T. Litz, T. M. Keane, P. A. Palmieri, B. P. Marx, and P. P. Schnurr, "The PTSD Checklist for DSM-5 (PCL-5)–Standard [Measurement instrument]," *Retrieved from from http://www. ptsd. va. gov*, 2013.

[10] A. P. Association, *Diagnostic and statistical manual of mental disorders (DSM-5®)*. American Psychiatric Pub, 2013.

[11] B. Gierk *et al.*, "The somatic symptom scale–8 (SSS-8): a brief measure of somatic symptom burden," *JAMA internal medicine*, vol. 174, no. 3, pp. 399–407, 2014.

[12] C. S. Carver, "You want to measure coping but your protocol'too long: Consider the brief cope," *International journal of behavioral medicine*, vol. 4, no. 1, p. 92, 1997.

[13] C. S. Carver, M. F. Scheier, and J. K. Weintraub, "Assessing coping strategies: a theoretically based approach.," *Journal of personality and social psychology*, vol. 56, no. 2, p. 267, 1989.

[14] N. A. Bowling and G. D. Hammond, "A meta-analytic examination of the construct validity of the Michigan Organizational Assessment Questionnaire Job Satisfaction Subscale," *Journal of Vocational Behavior*, vol. 73, no. 1, pp. 63–77, 2008.

[15] J. R. Halbesleben and E. Demerouti, "The construct validity of an alternative measure of burnout: Investigating the English translation of the Oldenburg Burnout Inventory," *Work & Stress*, vol. 19, no. 3, pp. 208–220, 2005.

[16] C. Sancho-Domingo, J. L. Carballo, A. Coloma-Carmona, and D. J. Buysse, "Brief version of the Pittsburgh Sleep Quality Index (B-PSQI) and measurement invariance across gender and age in a population-based sample.," *Psychological assessment*, vol. 33, no. 2, p. 111, 2021.

[17] E. G. Lambert *et al.*, “The relationship among distributive and procedural justice and correctional life satisfaction, burnout, and turnover intent: An exploratory study,” *Journal of Criminal justice*, vol. 38, no. 1, pp. 7–16, 2010.
[18] A. B. Bakker, A. I. Sanz-Vergel, A. Rodríguez-Muñoz, and W. G. Oerlemans, “The state version of the recovery experience questionnaire: A multilevel confirmatory factor analysis,” *European Journal of Work and Organizational Psychology*, vol. 24, no. 3, pp. 350–359, 2015.
[19] G. S. Armstrong, C. A. Atkin-Plunk, and J. Wells, “The relationship between work–family conflict, correctional officer job stress, and job satisfaction,” *Criminal justice and behavior*, vol. 42, no. 10, pp. 1066–1082, 2015.
[20] E. G. Lambert, N. L. Hogan, and S. M. Barton, “The nature of work-family conflict among correctional staff: An exploratory examination,” *Criminal Justice Review*, vol. 29, no. 1, pp. 145–172, 2004.
[21] E. G. Lambert, N. L. Hogan, S. D. Camp, and L. A. Ventura, “The impact of work–family conflict on correctional staff: A preliminary study,” *Criminology & Criminal Justice*, vol. 6, no. 4, pp. 371–387, 2006.
[22] S. Namazi *et al.*, “Examining a comprehensive model of work and family demands, work–family conflict, and depressive symptoms in a sample of correctional supervisors,” *Journal of occupational and environmental medicine*, vol. 61, no. 10, pp. 818–828, 2019.
[23] R. Triplett, J. L. Mullings, and K. E. Scarborough, “Work-related stress and coping among correctional officers: Implications from organizational literature,” *Journal of Criminal Justice*, vol. 24, no. 4, pp. 291–308, 1996.
[24] W. Saylor, E. B. Gillman, and S. D. Camp, “Prison and Social Climate Survey: Reliability and validity analyses of the work environment constructs,” *Washington DC: Federaul Bureau of Prisons*, pp. 1–47, 1996.
[25] B. Moon and S. R. Maxwell, “The sources and consequences of corrections officers’ stress: A South Korean example,” *Journal of Criminal Justice*, vol. 32, no. 4, pp. 359–370, 2004.
[26] B. Steiner and J. Wooldredge, “Individual and environmental sources of work stress among prison officers,” *Criminal Justice and Behavior*, vol. 42, no. 8, pp. 800–818, 2015.
[27] J. M. Ellison and J. W. Caudill, “Working on local time: Testing the job-demand-control-support model of stress with jail officers,” *Journal of Criminal Justice*, vol. 70, p. 101717, 2020.
[28] M. L. Griffin, “Gender and stress: A comparative assessment of sources of stress among correctional officers,” *Journal of Contemporary Criminal Justice*, vol. 22, no. 1, pp. 5–25, 2006.
[29] J. Fox, M. M. Desai, K. Britten, G. Lucas, R. Luneau, and M. S. Rosenthal, “Mental-health conditions, barriers to care, and productivity loss among officers in an urban police department,” *Connecticut medicine*, vol. 76, no. 9, p. 525, 2012.
[30] A. Groll, “Package ‘glmmLasso.’” [Online]. Available: https://cran.r-project.org/web/packages/glmmLasso/glmmLasso.pdf
[31] J. Schelldorfer, “An algorithm for high-dimensional generalized linear mixed models using l1-penalization,” *Schelldorfer, J., Meier, ML*, 2011.
[32] D. Tingley, T. Yamamoto, K. Hirose, L. Keele, and K. Imai, “Mediation: R package for causal mediation analysis,” 2014.

[33] H. L. Hudson, J. A. Nigam, S. L. Sauter, L. Chosewood, A. L. Schill, and J. E. Howard, “Total worker health.,” 2019.
[34] A. G. Dugan *et al.*, “Process evaluation of two participatory approaches: implementing total worker health® interventions in a correctional workforce,” *American journal of industrial medicine*, vol. 59, no. 10, pp. 897–918, 2016.
[35] L. A. Jaegers *et al.*, “Total Worker Health® needs assessment to identify workplace mental health interventions in rural and urban jails,” *American Journal of Occupational Therapy*, vol. 74, no. 3, pp. 7403205020p1-7403205020p12, 2020.
[36] Bureau of Labor Statistics, U.S. Department of Labor, “33-3012 Correctional Officers and Jailers,” Occupatioanl Employment Statistics. Accessed: Apr. 08, 2020. [Online]. Available: https://www.bls.gov/oes/current/oes333012.htm
[37] J. Bronson and E. A. Carson, “Prisoners in 2017,” U.S. Department of Justice Bureau of Justice Statistics, NCJ 252156, Apr. 2019.
[38] F. V. Ferdik and H. Smith, *Correctional officer safety and wellness literature synthesis*. US Department of Justice, Office of Justice Programs, National Institute of …, 2017.
[39] J. Brower, *Correctional officer wellness and safety literature review. US Department of Justice, Office of Justice Programs Diagnostic Center*. 2013.
[40] C. Finney, E. Stergiopoulos, J. Hensel, S. Bonato, and C. S. Dewa, “Organizational stressors associated with job stress and burnout in correctional officers: a systematic review,” *BMC public health*, vol. 13, no. 1, p. 82, 2013.