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Participatory Assessment and Selection of Workforce Health Intervention Priorities for Correctional Supervisors

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Objective: A team of academics and unionized correctional supervisors collaborated to assess workforce health and determine intervention priorities using participatory methods and tools. **Methods:** Correctional supervisors took a web-based survey. Univariate and bivariate tests examined attitudes/behaviors, exposures, and outcomes most strongly associated with health; risk based on rank within chain-of-command; and health behaviors amenable to change. We used a voting process tool to prioritize intervention topics. **Results:** Some health behaviors and outcomes were poor (89% overweight/obese, 41% poor-quality sleep). We also found favorable health behaviors (annual check-ups) and psychosocial conditions (meaningful work). Some health risks (excessive overtime) were not amenable to change or resisted acknowledgment (poor mental health). The team voted to develop interventions

on sleep, mental health, and obesity. **Conclusions:** Comprehensive health assessment informed the prioritization process, enabling the team to quickly reach consensus on intervention priorities.

Keywords: community-based participatory research, correctional supervisors, healthy workplace participatory program, Total Worker Health, workforce health assessment

Correctional employees demonstrate a number of occupational health disparities that distinguish them from other occupational groups. Correctional employees have a shorter life span than the national average (58 years vs 75 years, respectively).¹⁻⁴ Compared with other occupational groups, correctional employees have higher rates of injuries on the job,^{1,5} musculoskeletal disorders,⁶ cardiovascular disease,^{7,8} suicide,^{9,10} anxiety and depression,¹⁰ and alcohol and drug abuse.¹¹ They are also more prone to job stress, work-family conflict, and burnout.¹²⁻¹⁵

As public safety workers, correctional employees' working conditions in prison or jail are unique to their line of work. Their work environment is characterized by high psychological demands (eg, interpersonal conflict, inmate violence, hypervigilance, stress) and physical demands (eg, static sitting and standing, heavy lifting, emergency responses).^{6,11} Correctional employees also work extended and irregular shifts, and may be required to work mandatory overtime on short notice.¹⁶

Eliminating the health and safety disparities of correctional employees has received limited research and policy attention, and few programs designed to improve correctional worker health have been evaluated for effectiveness.^{1,17,18} While research on correctional employees has increased somewhat in the last two decades, most has focused on front-line correctional officers (COs).^{19,20} Health-related findings from this research may not be wholly generalizable to other subgroups of workers in corrections such as supervisors and prison health care personnel, whose work function and exposures considerably differ from that of COs.

Correctional supervisors are the middle managers in correctional facilities, whose job titles reflect quasi-military assignment (eg, lieutenant, captain). They are primarily in charge of administrative tasks and maintaining both security and policy within a correctional facility.^{21,22} Compared with COs, correctional supervisors have a higher level of responsibility and fewer organizational peers, which may place them at increased health risk. Although separated from COs due to their higher rank within the chain of command, supervisors are usually promoted from the CO ranks which confers common background experience.

There are also differences among supervisors themselves. In the state correctional system discussed in this study, supervisors include lieutenants, captains, and counselor supervisors. Captains and counselor supervisors (equivalently ranked) have a higher rank in the hierarchy compared with lieutenants, and they typically only work on weekdays, mostly on the first shift, have shorter commuting distances (due to more discretion over their job site), and are not obliged to fill posts. The result is a more predictable schedule with less overtime. Lieutenants are the largest group of supervisors, and they work on the front line with COs, which

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exposes them to stressors that are different from those of captains and counselor supervisors, and more similar to those of COs. Therefore, identification of stressors unique to correctional supervisors (particularly lieutenants) that account for differences in rank and responsibilities is an important research area for development, and a foundational step to interventions that aim to improve supervisor health.

HEALTH IMPROVEMENT THROUGH EMPLOYEE CONTROL (HITEC)

Health Improvement Through Employee Control (HITEC) is a research project initiated by investigators from the Center for the Promotion of Health in the New England Workplace (CPH-NEW), a National Institute for Occupational Safety and Health (NIOSH) Center of Excellence for Total Worker Health.²³ Total Worker Health (TWH) is an approach whereby workplace interventions simultaneously protect and promote worker health, by jointly addressing individual- and organizational-level factors that affect worker health. This approach is gathering increasing attention in corrections research and practice.¹⁸

HITEC is a collaboration of public university researchers and a state Department of Correction (DOC) in the northeast US. It has effectively used participatory techniques to study workplace factors and to design interventions that impact the health and well-being of the correctional workforce. Over 15 years of HITEC research has demonstrated that in corrections, workplace interventions designed with grassroots involvement of front-line workers using a participatory approach are more effective in improving worker health than traditional top-down, administratively-driven health interventions.^{24,25} In addition to having higher participation rates and greater acceptability,²⁶ participatory interventions are perceived by end-users as having more relevance, appropriateness, credibility, and compatibility with organizational culture.²⁷ Organizational barriers such as bureaucracy and hierarchy, poor leadership, and power imbalances, organizational climates characterized by a lack of flexibility and support, and poor employee motivation, can pose barriers to participatory methods, yet participatory programs have been more successful in the public sector (compared with the private sector) because of opportunities for worker empowerment and voice.^{28–30}

In 2014, within the HITEC project, a new partnership began between seven members of a correctional supervisors' union in the state (eg, captains, lieutenants, counselor supervisors) and two CPH-NEW academic researchers who formed a "Design Team" (a team that is tasked with developing interventions) to improve the health of correctional supervisors using community-based participatory research (CBPR) methods. In CBPR, members of a community (ie, people connected by shared norms and values, common language and customs, similar goals and needs, and collective interest in community well-being)³¹ are actively and equitably involved in all aspects of the research process, alongside scientific investigators. CBPR partnerships with the highest degree of equity are those in which community partners help determine research priorities, define research questions, contribute to study and intervention design, and make joint decisions about putting study findings into action to create change.³¹ A review of occupational and environmental health CBPR research found this level of participation in only a quarter of studies.³² Our goal in this study was to form and assess a partnership with the highest levels of involvement from the Design Team, as representatives of the community of correctional supervisors.

We did this by following the process and using tools from CPH-NEW's Healthy Workplace Participatory Program³³ (HWPP) on-line toolkit. Per the HWPP, the Design Team's initial task was to create a comprehensive and contextually-relevant survey to assess

the health of their workforce of correctional supervisors.³⁴ They first utilized the HWPP Focus Group Guide for Workplace Safety, Health and Well-being³⁵ to generate key themes regarding relevant health-related experiences and challenges faced by correctional supervisors. Then they used those themes to adapt the HWPP All Employee Survey (AES) to create their own customized survey, entitled the Correctional Supervisors' Healthy Workplace Survey. The AES is a generic workforce health assessment questionnaire.³⁶ Details of survey adaptation and the participatory survey design process are provided in a prior publication by Dugan et al.³⁷

In addition to providing a point-in-time assessment of supervisor health, the survey was intended to confirm whether the experiences described in focus groups held true for the entire supervisor workforce, thus enabling the Design Team to identify priority health concerns and develop targeted interventions to address them. In focus groups, supervisors identified 12 themes as organizational- or individual-level factors relevant to supervisor health and for possible intervention opportunities. These included unhealthy organizational culture, masculinity, work-family conflict, family support, stress and trauma, positive aspects of the job, health literacy and efficacy, health and risk behaviors, sleep, obesity, income and retirement, and the need make health a personal priority.³⁷

In this paper, we present the results of the survey developed by a Design Team using participatory methods, explain how survey results confirm or contradict previous work (including focus groups), and demonstrate how survey findings were used to inform decision-making about health intervention priorities. To guide the current study, the Design Team posed two research questions to examine the health-related attitudes and behaviors, exposures, and health and work outcomes of correctional supervisors. They also posed one research hypothesis to examine comparative differences between supervisors of different ranks (lieutenants vs captains and counselor supervisors). This hypothesis was posed in order to evaluate whether interventions should be targeted to different groups. We propose the following:

Research Question 1: What health-related attitudes and behaviors, exposures, and outcomes are most strongly associated with health in general?

Hypothesis 1: Supervisors with the rank of lieutenant will be at greater risk for poor health (worse health-related attitudes and behaviors, more exposures, worse outcomes) than those with the higher rank of captain or counselor supervisor.

Research Question 2: What specific health behaviors are supervisors most interested in changing?

METHODS

In this study, the Design Team who created the Correctional Supervisors' Healthy Workplace Survey,³⁷ continued the HWPP process by using the survey and another key tool: the HWPP Prioritizing and Selecting Safety and Well-being Concerns for Intervention Group Activity.³⁸ Details regarding the selection of Design Team members (ie, seven union members, two university researchers), as well as the 25-minute web-based survey assessing health-related attitudes and behaviors, attitudes and behaviors related to income and retirement, psychosocial exposures at work and home, health outcomes, work outcomes, and job and personal information (Table 1) are detailed in a prior study.³⁷ Protocols for the current study were approved by the University's Institutional Review Board.

Survey Participants and Administration

Correctional supervisors (ie, lieutenants, captains, counselor supervisors) working in the public sector (Department of Correction) in a northeastern US state across 19 correctional facilities (ie,

TABLE 1. The Correctional Supervisors’ Healthy Workplace Survey: Constructs, Measures, and Number of Items

Construct With Source of Measure Used	No.	Construct With Source of Measure Used	No.
Health-related behaviors and attitudes		Psychosocial family exposures	
Healthy eating ³⁹	1	Family health climate	4
Physical activity ⁴⁰	1	Health outcomes	
Cigarette smoking ⁴¹	1	General health ⁵⁸	1
Smoking cigars/pipe*	1	Chronic health conditions ³⁶	5
Chewing tobacco*	1	Body mass index	2
Gambling*	1	Psychological symptoms ⁵⁹	18
Consuming alcohol ^{42,43}	1	Health interference with work ⁶⁰	2
Consuming caffeine*	1	Musculoskeletal pain ³⁶	5
Accessing care*	5	Sleep ³⁶	4
Suppressing emotions ⁴⁴	4	Work outcomes	
Interpersonal caring and dominance ^{45,46}	8	Stress ³⁶	2
Fatalistic thinking about health ⁴⁷	4	Work-family conflict ⁶¹	4
Readiness for change ⁴⁸	8	Behavior-based work-family conflict ⁶²	4
Attitudes related to health, income, retirement, and overtime		Burnout ⁶³	2
Retirement thoughts*		Job satisfaction ^{64,65}	2
Expected health post-retirement*	1	Intent to turnover ^{64,65}	1
Expected happiness post-retirement*	2	Personal information	
Longevity, health, income, retirement*	2	Dependents ³⁶	2
Proximity to retirement*	6	Demographics ³⁶	6
Retirement-financial confidence ⁴⁹	1	Work information	
Retirement-financial situation ⁴⁹	1	Overtime hours*	1
Psychosocial work exposures	1	Commuting time ⁵⁸	1
Civility norms ⁵⁰	1	Work history ³⁶	4
Job content: social support ⁵¹	2	Facility/Location*	1
Job security ⁵¹	4	Other	
Emotional job demands ⁵²	1	Informed consent	1
Org. support for health and safety ⁵³	1	Use of social media*	1
Work health climate ⁵⁴	2	Advice to new recruits*	1
Supervisor communication ⁵⁵	3	Other comments ³⁶	1
Masculine org. culture ⁵⁶	4		
Effect of traumatic events at work*	6		
Meaningful work ⁵⁷	18		

DT, Design Team; total No. survey items = 170.

*Indicates an original item created by the Design Team.

prisons, jails) were invited to participate in the cross-sectional survey. The 19 facilities housed approximately 13,400 incarcerated people and had 5210 workers staffing the facilities, including 423 supervisors. All participants were members of the correctional supervisors’ union who supervised correctional officers in the state’s Department of Correction facilities.

The survey was distributed by the union vice president to all 423 union members via an email that explained the survey purpose (ie, to conduct a health needs assessment for intervention planning) and invited supervisors to participate in the online survey by clicking a web link. The survey was open for one month and there were no incentives for study participation. Two weeks after the survey launch, the Design Team held a meeting to discuss and implement ways to promote study participation to increase the response rate (eg, sending a reminder email, making announcements at union meetings).

Prioritizing and Selecting Safety and Well-being Concerns for Intervention Group Activity

The HWPP Prioritizing and Selecting Safety and Well-being Concerns for Intervention Group Activity starts off with the Design Team first reviewing and discussing the results of the workforce health assessment; this is intended to inform opinions in preparation for deciding upon health intervention priorities. Descriptive analyses of survey data, as well as univariate and bivariate analyses,

were conducted by the academic team members and presented as tables and figures in a PowerPoint presentation (key figures are presented in Appendix A, <http://links.lww.com/JOEM/B75>) for the Design Team’s review.

Next, each individual member creates a list of issues that they would like the Design Team to prioritize for developing interventions. Each Design Team member shares their top three issues to generate a larger group list, and if topics are similar in theme, they may be grouped together. Each Design Team member votes for three topics on the group list. The topics that receive the top three votes are designated as priorities. However, the topic that receives the most votes is not necessarily the choice for developing an intervention. Rather, the team discusses which priority topic among the three is the best choice for the first intervention initiative. Mitigating considerations include feasibility and potential for positive impact on the workforce. If consensus on a first topic is not reached by discussion, each person may again vote and the topic that receives the most votes is selected.

Corrections employees and union leaders are typically cautious about worker privacy, and since this was a CBPR study where the Design Team provided input into study procedures, they opted not to audio-record and transcribe the group activity. Rather, two Design Team members took detailed notes, recording what was discussed throughout the group activity’s consensus-building and voting processes.

Data Analysis

All analyses were conducted by the two university researchers, using IBM SPSS Statistics for Windows, version 26.0 (IBM Corp., Armonk, NY). Using principles of participatory research, the Design Team provided input into which analyses would be conducted. We used descriptive statistics, univariate analyses (*t* tests), and bivariate analyses (correlations) because the data were collected primarily for use by the Design Team, rather than for research (its secondary purpose).

To answer the first research question, we examined the bivariate Pearson correlations of various health-related attitudes and behaviors, psychosocial exposures, and outcomes with a “General Health” variable that assessed self-reported health (“In general would you say your health is. . .”) on a scale from 1 (poor) to 5 (excellent). The study’s hypothesis was tested using independent-samples *t* tests to assess differences between two groups of supervisors (lieutenants vs captains/counselor supervisors). The second research question was answered by examining the eight individual items that made up the “Readiness for Change” measure, in which participants indicated interest in adopting eight health behaviors through responses of 0 (not interested in changing) or 1 (interested in changing). Of those who completed the survey, missing data were excluded from the analyses.

Although unplanned, during the review and discussion of results, the Design Team also opted to compare some of the health-related survey findings from correctional supervisors to those of the general US adult population. They also requested some targeted post

hoc analyses (*t* tests, Pearson correlations) in order to further understand relationships among study variables (results described but not shown). We present this information along with the results of the planned analyses as it was instrumental in helping the Design Team make decisions about intervention priorities.

RESULTS

Of the 423 supervisors invited, 157 participated in the online survey, representing a response rate of 37%. Demographic administrative data provided by the DOC Human Resources office confirmed that the 37% who participated were representative of the larger DOC supervisor population. The mean (SD) age of participants was 42 years (6.05) (see Table 2). Fifty percent of the sample was between 41 and 50 years old. The sample was 78% men, 69% White/non-Hispanic, 73% married/partnered, and 46% had bachelor’s degree or higher. Most were lieutenants (59%) and the rest were captains and counselor supervisors. Most participants (64%) worked the first (daytime) shift and worked a mean (SD) of 12.8 (11.6) overtime hours per week. Mean (SD) DOC tenure was 15.4 years (4.72). There were statistically significant differences between the two supervisor groups. Compared with captains/counselor supervisors, lieutenants had a lower education level and fewer years of job tenure, were more likely to work second or third shift (rather than first), and worked more overtime hours.

TABLE 2. Demographics and Work Information of Overall Sample by Job Classification (*n* = 157)

	Overall Sample <i>N</i> (%) or Mean (SD)	Lieutenants <i>N</i> (%) or Mean (SD)	Captains and Counselor Supervisors <i>N</i> (%) or Mean (SD)	<i>P</i> -Value
Age (in years)*	42.3 (6.1)	42.1 (6.8)	42.6 (4.8)	0.56
Sex†				
Female	34 (22%)	15 (44%)	19 (56%)	0.06
Male	122 (78%)	78 (64%)	44 (36%)	
Race/Ethnicity†				
People of color/Hispanic	48 (31%)	31 (65%)	17 (35%)	0.51
White/non-Hispanic	108 (69%)	62 (57%)	46 (43%)	
Education†				
High school or some college	85 (54%)	60 (71%)	25 (29%)	0.004
College degree or graduate degree	71 (46%)	33 (46%)	38 (54%)	
Marital status†				
Widowed, divorced, separated, or single	42 (27%)	27 (64%)	15 (36%)	0.59
Married or live with partner	114 (73%)	66 (58%)	48 (42%)	
Annual family income†				
Less than \$125,000	86 (56%)	52 (60%)	34 (40%)	0.88
\$125,000 or more	69 (45%)	40 (58%)	29 (42%)	
Child care responsibility†				
No	42 (27%)	29 (69%)	13 (31%)	0.20
Yes	115 (73%)	64 (56%)	50 (44%)	
Elder/adult care responsibility†				
No	110 (70%)	68 (62%)	41 (38%)	0.37
Yes	47 (30%)	25 (53%)	22 (47%)	
Job tenure (in years)*	15.4 (4.7)	14.1 (4.8)	17.38 (3.90)	<0.001
Primary shift†				
First shift	99 (64%)	48 (48%)	51 (52%)	<0.001
Second or third shift	56 (36%)	45 (80%)	11 (20%)	
Overtime per week (in hours)*	12.8 (11.6)	17.5 (11.1)	5.7 (8.3)	<0.001
Commuting time†				
Less than 60 minutes	126 (80%)	76 (61%)	49 (39%)	0.69
60 minutes or greater	31 (20%)	17 (55%)	14 (45%)	

Bold values indicate statistical significance.

Percentages, means, and standard deviations listed were calculated by excluding missing cases.

**t* Test.

†Chi-square.

TABLE 3. Alphas, Means With Standard Deviations, and Correlations for Health Behaviors/Attitudes by Job Classification (*n* = 157)

	No. of Scale Items	α^a	Min	Max	Corr. with General Health ^b	Overall Sample Mean (SD)	Lieutenants Mean (SD)	Captains and Counselor Supervisors Mean (SD)	<i>P</i> -Value ^c
Healthy eating	1	—	1	5	0.36***	2.85 (0.93)	3.00 (0.93)	2.75 (0.92)	0.10
Physical activity	1	—	1	5	0.50***	3.12 (1.20)	3.11 (1.19)	3.17 (1.19)	0.73
Cigarette smoking	1	—	1	5	-0.03	1.54 (1.03)	1.70 (1.21)	1.27 (0.55)	0.003
Smoking cigars or pipe	1	—	1	5	-0.23**	1.32 (0.73)	1.29 (0.75)	1.37 (0.73)	0.54
Chewing tobacco	1	—	1	5	-0.18*	1.45 (1.20)	1.47 (1.25)	1.41 (1.15)	0.76
Gambling	1	—	1	5	-0.13	1.62 (0.67)	1.63 (0.72)	1.60 (0.61)	0.78
Consuming alcohol	1	—	1	5	-0.08	1.94 (0.94)	2.06 (0.99)	1.76 (0.84)	0.048
Consuming caffeine	1	—	1	5	-0.21**	2.46 (0.90)	2.53 (0.94)	2.38 (0.83)	0.32
Access care: have primary care doctor	1	—	1	3	0.13	2.92 (0.39)	2.87 (0.50)	2.98 (0.13)	0.04
Access care: have mental health prof	1	—	1	3	0.10	1.48 (0.83)	1.46 (0.83)	1.51 (0.84)	0.74
Access care: have annual checkups	1	—	1	3	0.06	2.96 (0.22)	2.96 (0.25)	2.97 (0.18)	0.76
Suppressing emotions	4	0.81	1	5	0.01	3.04 (0.80)	3.01 (0.84)	3.09 (0.76)	0.52
Interpersonal caring	4	0.84	1	5	0.07	3.36 (0.81)	3.23 (0.85)	3.54 (0.71)	0.02
Interpersonal dominance	4	0.79	1	5	0.12	3.36 (0.79)	3.46 (0.80)	3.24 (0.76)	0.09
Fatalism: lack of control over health	2	0.76	1	5	0.02	2.32 (1.01)	2.22 (1.01)	2.46 (1.01)	0.15
Fatalism: personal responsibility	2	0.69	1	5	0.16*	4.08 (0.83)	4.08 (0.86)	4.10 (0.80)	0.88
Readiness for change (sum of 8)	8	—	0	8	-0.30***	4.03 (2.09)	4.14 (2.13)	3.87 (2.04)	0.44

Bold values indicate statistical significance.

Means and standard deviations listed were calculated by excluding missing cases. Healthy eating, physical activity (1 = Never, 5 = Always); cigarette smoking (1 = Never smoked, 5 = 10+ cig weekly); smoking cigars/pipe, chewing tobacco, gambling (1 = Never, 5 = Daily); consuming alcohol (1 = 0 drinks weekly, 5 = 21+ drinks weekly); consuming caffeine (1 = 0 beverages daily, 5 = 10+ beverages daily); access care (1 = no, 2 = unsure, 3 = yes); suppressing emotions, fatalism (1 = strongly disagree, 5 = strongly agree); interpersonal caring and dominance (1 = almost never true; 5 = almost always true); readiness for change (0 = not interested in change any health behaviors, 8 = interested in changing 8 health behaviors).

^aCronbach α .

^bPearson correlation.

^cIndependent samples *t* test.

**P* < 0.05.

***P* < 0.01.

****P* < 0.001.

Correctional Supervisors' Healthy Workplace Survey

The Design Team reviewed and discussed the survey results as detailed below.

Health-related Behaviors and Attitudes

Most respondents reported moderately meeting expert recommendations for healthy eating and physical activity (see Table 3). Specifically, 37% of respondents never or rarely met expert recommendations for physical activity, and 43% never or rarely met expert recommendations for fruit and vegetable consumption (Figure 1 in Appendix A, <http://links.lww.com/JOM/B75>). Consistent with the established anti-smoking policies of DOC, a small number of respondents smoked cigarettes daily (10%), but a larger number chewed tobacco daily (11%). The Design Team compared these findings to the 14% cigarette smoking rate of US adults⁶⁶ and the 2.4% of adults aged 18+ who report use of smokeless tobacco.⁶⁷ A small number of respondents reported regularly smoking a cigar/pipe or gambling. Regarding alcohol, most respondents (59%) reported having 1 to 14 drinks per week, with 8% consuming 15+ drinks per week. This was much higher than the 5.1% of US adults aged 22 to 44 years old who consume 14+ drinks per week⁶⁸

Caffeine consumption was high, with 30% consuming 4+ beverages daily. This was much higher than the 10% of general population who consume a mean daily caffeine intake of ~4 beverages (380 mg) per day,⁶⁹ the limit recommended by the US Food and Drug Administration.⁷⁰ Post hoc analyses requested by the Design Team (not shown) indicated that caffeine consumption was positively correlated with overtime hours, sleep difficulty, work and home stress, and psychological symptoms (anxiety, depression, hostility).

Most respondents had a primary care doctor/provider (96%) and received annual checkups (97%) with recommended screenings (mean ratings on a 3-point scale were both ~3). The Design Team noted this was much higher than the United States adult population in which 75% have an identified source of primary care⁷¹ and one-third receive annual physicals (preventive examinations).⁷² Considerably fewer (22%) supervisors had an identified mental health professional to receive psychological care from (~1.5 on a three-point scale). Most reported a strong sense of personal responsibility for their health (~4 on a five-point scale). Respondents reported moderate levels of emotional suppression (~3 on a five-point scale) and post hoc tests requested by the Design Team (not shown) indicated emotional suppression was positively correlated with being affected by work trauma (inmate-directed), behavior-based work-to-family conflict, and psychological symptoms (depression, anxiety).

Respondents reported moderate levels of both interpersonal caring and dominance (both 3.4 on a five-point scale). Post hoc independent-samples *t* tests, which were requested by the Design Team, showed that female supervisors reported being more caring than males, but there were no differences in reported social dominance when comparing women and men (Figure 2 in Appendix A, <http://links.lww.com/JOM/B75>). Other post hoc tests showed that some poorer health behaviors (excess caffeine consumption, emotional suppression, more overtime hours, prioritizing earnings over health) were correlated with social dominance and one health behavior (fewer overtime hours) was correlated with caring.

Several attitudes and behaviors were positively correlated with general health including healthy eating, physical activity, and personal responsibility for one's health. General health was negatively correlated with smoking cigars/pipes, chewing tobacco, consuming caffeine, and less overall readiness to improve health behaviors.

TABLE 4. Means With Standard Deviations and Correlations for Attitudes on Longevity, Income, Overtime, and Retirement by Job Classification (*n* = 157)

	No. of Scale Items	Min	Max	Corr. with General Health ^a	Overall Sample Mean (SD)	Lieutenants Mean (SD)	Captains and Counselor Supervisors Mean (SD)	P-Value ^b
Retirement thoughts often	1	1	5	-0.18*	4.05 (1.02)	4.23 (0.92)	3.81 (1.12)	0.012
Expected improvement in health post-retirement	2	-	-	-0.31***	1.32 (1.44)	1.32 (1.33)	1.33 (1.62)	0.96
Expected improvement in happiness post-retirement	2	-	-	-0.26**	2.28 (2.08)	2.37 (1.92)	2.19 (2.31)	0.61
Less overtime healthier	1	1	3	-0.16*	2.10 (0.81)	2.29 (0.78)	1.83 (0.79)	<0.001
Early death is risk of the job	1	1	3	-0.25**	2.56 (0.70)	2.65 (0.62)	2.46 (0.78)	0.12
Aware of short life span due to job	1	1	3	-0.02	2.85 (0.44)	2.82 (0.49)	2.90 (0.35)	0.19
Prioritize earnings over health	1	1	3	-0.20*	1.97 (0.93)	2.13 (0.90)	1.76 (0.93)	0.02
Health should not wait until retirement	1	1	3	-0.08	2.67 (0.67)	2.65 (0.69)	2.70 (0.66)	0.63
Plan to retire at 20 years	1	1	3	-0.03	2.17 (0.83)	2.40 (0.75)	1.86 (0.84)	<0.001
Proximity to retirement (in years)	1	0	18	0.14	6.80 (4.28)	7.39 (4.43)	5.87 (3.90)	0.04
Retirement financial confidence	1	1	5	0.25**	3.35 (1.13)	3.34 (1.13)	3.35 (1.15)	0.95
Retirement financial situation	1	1	4	0.16*	3.05 (0.82)	3.11 (0.73)	2.95 (0.92)	0.24

Bold values indicate statistical significance.

Notes. Means and standard deviations listed were calculated by excluding missing cases. Retirement thoughts often (1 = strongly disagree, 5 = strongly agree); less overtime healthier, early death job risk, aware of short life span, prioritize earnings over health, health should not wait, plan to retire at 20 years (1 = no, 2 = unsure, 3 = yes); proximity to retirement (no. of years until retirement); retirement financial confidence (1 = not at all, 5 = very); retirement financial situation (1 = won't have enough to meet basic needs, 4 = able to live comfortably).

^aPearson correlation.

^bIndependent samples t test.

**P* < 0.05.

***P* < 0.01.

****P* < 0.001.

There were statistically significant differences between the two supervisor groups on some variables. Compared with captains/counselor supervisors, lieutenants reported smoking more (*P* = 0.003), drinking more alcohol (*P* = 0.048), being less likely to have a primary care physician (*P* = 0.04), and showing less interpersonal caring (*P* = 0.02). They also reported marginally more interpersonal dominance.

In terms of participants' readiness to make changes or improvements to health, respondents on average were moderately interested in improving health behaviors overall (mean response showed interest in changing ~4 out of 8.0 possible health behaviors). (Figure 3 in Appendix A, <http://links.lww.com/JOM/B75>, shows detail of specific health behaviors supervisors were most interested in changing.) The highest percentage of respondents (80%) reported an interest in reducing stress, followed by improving sleep (71%), practicing healthy eating habits (66%), getting physical greater activity (62%), and losing weight (59%). Fewer respondents were interested in reducing use of caffeine, cigarettes/tobacco, or alcohol.

With regard to reported attitudes on health, longevity, income, and overtime hours (see Table 4), most supervisors thought often about retirement (~4 on a five-point agreement scale). Most reported that they would retire after 20 years (as early as possible) and that they would be healthier and happier after they retire. Most were aware that the lifespan of correctional workers is short and that earlier death is a job risk (2.9 and 2.6, respectively, on a three-point scale). Most thought that health should not have to be delayed until one retires (2.7 on a three-point scale). Many reported that they currently felt they had to prioritize earnings over their health (~2 on a three-point scale), but acknowledged they would probably be healthier if they worked less overtime (~2 on a three-point scale).

Two attitudes were positively correlated with supervisors' general health, including feeling confident in their ability to meet financial needs in retirement and thinking that they would be financially comfortable after they retire. General health was negatively correlated with frequent thoughts of retirement, thinking that health and happiness would increase after retirement, thinking that

working less overtime would improve health, awareness that an earlier death is a job risk, and prioritizing earnings over health.

There were statistically significant differences between the two supervisor groups on several variables. Captains/counselor supervisors were closer to retirement (in years) than lieutenants (Mean [SD] of 5.87 (3.90) vs 7.39 [4.43] respectively; *P* = 0.039). However, compared with captains/counselor supervisors, lieutenants thought more often about retirement (*P* = 0.01), planned to retire after 20 years (as early as possible) (*P* < 0.001), prioritized earnings over health (*P* = 0.02), and thought that they would be healthier with less overtime (*P* < 0.001)

Psychosocial Exposures

Regarding psychosocial exposures at work and home (see Table 5), job security and meaningful work were high (mean ratings on a five-point agreement scale were 4.3 and 4.0, respectively). Emotional job demands were high (3.9 on a five-point scale), and post hoc tests requested by the Design Team (not shown) indicated that emotional job demands were positively correlated with feeling affected by work trauma (inmate-directed, self/peer-directed), stress (work, home), burnout, work-to-family conflict and family-to-work conflict (all forms), and psychological symptoms (depression, anxiety, hostility).

Supervisor and coworker social support, organizational support for health and safety, and supervisor communication were moderately high (~3.5 on a five-point scale). Family health climate and work health climate were fairly high (~3.5 on a five-point scale). Ratings of civility norms and masculine organizational culture were moderate (~3 on a five-point scale), and post hoc tests (not shown) indicated a positive correlation between perceiving a masculine organizational culture and being a female supervisor. Regarding the effect of traumatic events at work, ratings were low, and respondents reported being more greatly affected by trauma directed to self/peers (~2 on a five-point scale) than by trauma directed to inmates (~1 on a five-point scale). Post hoc analyses requested by the Design Team (not shown) indicated

TABLE 5. Alphas, Means With Standard Deviations, and Correlations for Psychosocial Work Exposures by Job Classification (*n* = 157)

	No. of Scale Items	α^a	Min	Max	Corr. with General Health ^b	Overall Sample Mean (SD)	Lieutenants Mean (SD)	Captains and Counselor Supervisors Mean (SD)	<i>P</i> -Value ^c
Work exposures									
Civility norms	2	0.21	1	5	0.02	2.94 (0.86)	2.83 (0.86)	3.10 (0.83)	0.049
Coworker social support	2	0.71	1	5	0.25**	3.55 (0.75)	3.43 (0.76)	3.72 (0.71)	0.02
Supervisor social support	2	0.86	1	5	0.15	3.66 (0.95)	3.64 (0.92)	3.68 (1.01)	0.79
Job security	1	–	1	5	0.02	4.25 (0.72)	4.16 (0.73)	4.38 (0.68)	0.06
Emotional job demands	1	–	1	5	-0.22**	3.89 (0.92)	3.94 (0.92)	3.83 (0.93)	0.47
Organizational support for health/safety	2	0.83	1	5	0.17*	3.55 (0.97)	3.41 (1.05)	3.78 (0.79)	0.01
Work health climate	3	0.72	1	5	0.24**	3.34 (0.83)	3.27 (0.87)	3.46 (0.77)	0.15
Supervisor communication	4	0.85	1	5	0.21**	3.39 (0.80)	3.28 (0.85)	3.56 (0.71)	0.02
Masculine organizational culture	3	0.83	1	5	-0.03	2.96 (0.90)	2.90 (0.82)	3.05 (1.01)	0.29
Effect of trauma directed to inmates	4	0.83	1	4	-0.13	1.35 (0.51)	1.38 (0.53)	1.33 (0.47)	0.55
Effect of trauma directed to self/peers	5	0.86	1	4	-0.16	2.04 (0.79)	2.05 (0.79)	2.02 (0.79)	0.81
Meaningful work	3	0.94	1	5	0.17*	4.05 (0.84)	3.94 (0.87)	4.21 (0.79)	0.05
Family exposures	4	0.75	1	5	0.26**	3.53 (0.62)	3.47 (0.63)	3.61 (0.61)	0.17
Family health climate									

Bold values indicate statistical significance.

Means and standard deviations listed were calculated by excluding missing cases. Civility norms, coworker and supervisor social support, job security, emotional job demands, organizational support for health and safety, work health climate, supervisor communication, masculine organizational culture, effect of trauma, meaningful work, family health climate (1 = strongly disagree, 5 = strongly agree).

^aCronbach α .

^bPearson correlation.

^cIndependent samples *t* test.

**P* < 0.05.

***P* < 0.01.

positive correlations between seven out of nine types of experienced trauma and weekly alcohol consumption.

Exposures that were positively correlated with general health included coworker social support, organizational support for health and safety, work health climate, supervisor communication, meaningful work, and family health climate. General health was negatively correlated with emotional job demands.

Several variables differed based on supervisor group. Compared with captains/counselor supervisors, lieutenants reported lower civility norms (*P* = 0.049), lower coworker support (*P* = 0.02), lower organizational support for health and safety (*P* = 0.01), and less supervisor communication (*P* = 0.02).

Health Outcomes

Regarding health outcomes (see Table 6), respondents reported relatively good general health (3.4 on a five-point scale) and an average of one chronic health condition (mean response was presence of ~1 out of 5.0 possible chronic health conditions). The most common chronic conditions (see Figure 4 in Appendix A, <http://links.lww.com/JOM/B75>) were high cholesterol (24%) and hypertension/high blood pressure (23%). In a post hoc analyses requested by the Design Team (not shown) lieutenants were more likely to report having anxiety/depression compared with captains/counselor supervisors. In terms of body mass index (BMI), 51% fell in the obese category (compared with the 42% age-adjusted prevalence of obesity in US adults).⁷³ (See Figure 5 in Appendix A, <http://links.lww.com/JOM/B75>) An additional 38% fell in the BMI category of overweight. Average ratings of musculoskeletal pain and health interference with work were low (~2 on a five-point scale).

Supervisors reported low psychological symptoms of anxiety, depression, and hostility (mean ratings ranged from 1.6 to 2.0 on a five-point scale). (See Figure 6 in Appendix A, <http://links.lww.com/JOM/B75>) Hostility (2.0) was the most severe self-reported

psychological symptom experienced, followed by anxiety (1.9) and depression (1.6). Supervisors also reported their perceptions of the symptoms experienced by other supervisors they work with, which showed that supervisors perceived others' symptoms as more severe than their own. Hostility (2.6) was perceived to be the most severe psychological symptom attributed to other supervisors, followed by anxiety (2.4) and depression (2.0).

Sleep-related findings showed that 41% of supervisors reported (very or fairly) poor sleep quality on a typical night. 57% of respondents reported 6 or fewer hours of sleep each day during a regular work week, while only 11% reported 8 or more hours, the amount recommended by sleep experts. (See Figure 7 in Appendix A, <http://links.lww.com/JOM/B75>) Comparing actual sleep hours to needed sleep hours, respondents had much less sleep than they needed to have good functioning. About 32% reported (moderate to severe) difficulty sleeping due to physical and emotional problems.

General health was positively correlated with sleep quality. Health outcomes that were negatively correlated with general health included number of chronic health conditions, BMI, self-reported psychological symptoms, health interference with work, musculoskeletal pain, sleep difficulty, and needed sleep hours. In terms of difference between supervisor groups, lieutenants reported poorer sleep quality compared with captains/counselor supervisors (*P* = 0.04); this may be related to other differences described earlier, including lieutenants being less likely to work the dayshift and working more overtime hours.

Post hoc tests requested by the Design Team (not shown) indicated that some poorer health outcomes (difficulty sleeping, lower sleep quality) were correlated with social dominance, and some better health outcomes (higher sleep quality, fewer reports of back disease/spine problems as a chronic condition, lower cholesterol) were correlated with caring. They also showed that poorer mental health (greater effect of inmate-directed trauma, depressive and hostility symptoms, work stress, and burnout) was

TABLE 6. Alphas, Means With Standard Deviations, and Correlations for Health Outcomes by Job Classification (*n* = 157)

	No. of Scale Items	α^a	Min	Max	Corr. with General Health ^b	Overall Sample Mean (SD)	Lieutenants Mean (SD)	Captains and Counselor Supervisors Mean (SD)	<i>P</i> -Value ^c
General health	1	–	1	5	–	3.44 (0.75)	3.41 (0.73)	3.48 (0.78)	0.58
Chronic health conditions (sum of 5)	5	–	0	5	–0.44***	0.90 (1.06)	0.82 (1.05)	1.05 (1.08)	0.18
Body mass index	1	–	18	43	–0.39***	30.2 (4.30)	29.9 (4.23)	30.8 (4.32)	0.19
Psych symptoms: depression (self)	3	0.90	1	5	–0.22**	1.59 (0.80)	1.60 (0.86)	1.58 (0.73)	0.90
Psych symptoms: anxiety (self)	3	0.83	1	5	–0.26**	1.90 (0.87)	1.91 (0.92)	1.90 (0.80)	0.93
Psych Symptoms: Hostility (Self)	3	0.87	1	5	–0.29***	2.00 (0.91)	2.11 (0.97)	1.85 (0.78)	0.08
Psych symptoms: depression (others)	3	0.92	1	5	–	2.01 (0.86)	2.05 (0.95)	1.97 (0.69)	0.59
Psych symptoms: anxiety (others)	3	0.89	1	5	–	2.44 (0.81)	2.43 (0.93)	2.46 (0.58)	0.83
Psych symptoms: hostility (others)	3	0.91	1	5	–	2.62 (0.94)	2.61 (1.02)	2.66 (0.79)	0.73
Health interference with work	2	0.94	1	5	–0.42***	1.76 (0.95)	1.76 (0.99)	1.79 (0.91)	0.86
Musculoskeletal pain	5	0.79	1	5	–0.37***	1.99 (0.75)	2.06 (0.80)	1.90 (0.65)	0.17
Sleep difficulty	1	–	1	5	–0.37***	2.05 (1.06)	2.09 (1.12)	2.02 (0.98)	0.69
Actual sleep hours	1	–	1	5	0.13	1.57 (0.82)	1.56 (0.87)	1.59 (0.75)	0.83
Needed sleep hours	1	–	1	5	–0.17*	2.22 (0.93)	2.11 (0.96)	2.40 (0.87)	0.06
Sleep quality	1	–	1	4	0.29***	2.64 (0.79)	2.53 (0.75)	2.79 (0.85)	0.04

Bold values indicate statistical significance.

Means and standard deviations listed were calculated by excluding missing cases. General health (1 = poor, 5 = excellent); chronic conditions (0 = 0 chronic health conditions, 5 = 5 chronic health conditions); body mass index (BMI calculation based on weight and height); psychological symptoms for self/other (1 = not at all, 5 = extremely); health interference with work (1 = strongly disagree, 5 = strongly agree); musculoskeletal pain (1 = mild, 5 = extreme); sleep difficulty (1 = no difficulty, 5 = so much difficulty that i can't sleep); actual and needed sleep hours (1 = 6 hours or less, 5 = 10 hours or more); sleep quality (1 = very poor, 4 = very good).

^aCronbach α .

^bPearson correlation.

^cIndependent samples *t* test.

**P* < 0.05.

***P* < 0.01.

****P* < 0.001.

correlated with social dominance, and better mental health (less hostility, burnout, anxiety, and home stress) and less work-family conflict (behavior-based work-to-family conflict, behavior-based family-to-work conflict) were correlated with caring.

Work Outcomes

Regarding work outcomes (see Table 7), findings showed moderate levels of overall stress (~3 on a five-point scale). Ratings on general work-to-family conflict (WFC) and family-to-work conflict (FWC) were low-to-moderate (2.8 and 2.2, respectively, on a five-point scale). (See Figure 8 in Appendix A, <http://links.lww.com/JOM/B75>) Ratings of behavior-based WFC and FWC (which occurs when behaviors that are effective in one life role are inappropriate in another role) were higher (3.2 and 3.1, respectively, on a five-point scale). Ratings on job satisfaction were high (~4 on a five-point scale), burnout was moderate (~3 on a five-point scale), and turnover intentions were low (~2 on a five-point scale).

General health was positively correlated with job satisfaction. Health outcomes that were negatively correlated with general health included stress, general WFC and FWC, behavior-based WFC and FWC, burnout, and turnover intent. In terms of difference between supervisor groups, lieutenants reported greater behavior-based FWC compared with captains/counselor supervisors (*P* = 0.02).

Prioritization and Selection of Safety and Well-Being Concerns

After reviewing and discussing the workforce health assessment survey results, Design Team members each generated a list of issues that they would like the team to prioritize for developing interventions, and then shared their top three issues with team

members. Similar topics were grouped together, resulting in a group list that included 10 possible topics for intervention (see Table 8): improving sleep quality/quantity, weight loss, reducing stress, reducing alcohol/substance use, improving healthy eating, increasing physical activity, reducing caffeine use, improving healthy emotional expression, reducing high blood pressure/cholesterol, and reducing musculoskeletal pain. Each Design Team member then voted for three priority topics from the group list. The Design Team tallied votes, noted the most-voted-for topics, and then discussed what topic would be most feasible, impactful, and well-accepted as a first intervention initiative.

The Design Team determined that the best approach would be to focus on health concerns that affected a large number of supervisors and that they were motivated to address. To that end, much of the discussion centered on survey responses to the question regarding supervisor readiness to change various health behaviors. For example, during the review of survey results, sleep and obesity were seen as areas of concern affecting many supervisors, and were topics that both received the highest number of votes (4) as a priority topic, but because more survey respondents indicated that they were ready to improve their sleep (71%) than lose weight (59%), the Design Team chose to develop a sleep intervention as their first priority.

The mental health-related issues of reducing stress and alcohol/substance use both received the second highest number of Design Team votes (3) as a priority topic. Although 80% of supervisors respondents were ready to reduce stress (it was the health behavior they were most interested in changing) and the Design Team noted that most survey variables measuring stress and poor mental health were associated with poorer overall health, survey responses showed low self-reports of mental health problems, suggesting that supervisors may not be aware of or recognize their experiences as being of concern for mental health. Notably, although alcohol/substance use was voted for as a priority topic

TABLE 7. Alphas, Means With Standard Deviations, and Correlations for Work Outcomes by Job Classification (*n* = 157)

	No. of Scale Items	α^a	Min	Max	Corr. with General Health ^b	Overall Sample Mean (SD)	Lieutenants Mean (SD)	Captains and Counselor Supervisors Mean (SD)	<i>P</i> -Value ^c
Stress	2	0.47	1	5	-0.28***	2.87 (0.72)	2.87 (0.76)	2.90 (0.62)	0.77
Work-to-family conflict	2	0.75	1	5	-0.33***	2.78 (1.01)	2.81 (1.00)	2.75 (1.02)	0.69
Family-to-work conflict	2	0.76	1	5	-0.17*	2.19 (0.88)	2.26 (0.94)	2.10 (0.79)	0.26
Behavior-based work-to-family conflict	2	0.75	1	5	-0.27**	3.23 (0.92)	3.33 (0.87)	3.10 (0.98)	0.11
Behavior-based family-to-work conflict	2	0.86	1	5	-0.17*	3.09 (0.92)	3.23 (0.93)	2.88 (0.90)	0.02
Burnout	2	0.83	1	5	-0.33***	3.08 (1.12)	3.14 (1.05)	3.03 (1.19)	0.55
Job satisfaction	2	0.73	1	5	0.28***	3.78 (0.84)	3.73 (0.91)	3.83 (0.72)	0.43
Intent to turnover	1	–	1	5	-0.17*	2.10 (1.30)	2.09 (1.30)	2.11 (1.32)	0.91

Bold values indicate statistical significance.

Means and standard deviations listed were calculated by excluding missing cases. Stress (1 = no stress, 5 = extreme stress); work-to-family conflict, family-to-work conflict (1 = never, 5 = always); behavior-based work-to-family conflict, behavior-based family-to-work conflict, burnout, satisfaction, intent to turnover (1 = strongly disagree, 5 = strongly agree).

^aCronbach α .

^bPearson correlation.

^cIndependent samples *t* test.

**P* < 0.05.

***P* < 0.01.

****P* < 0.001.

because of survey results showing heavy alcohol use, alcohol use was the behavior that survey respondents were least ready to change (18%), and the Design Team felt that there would be a lack of interested participants for alcohol interventions. For these reasons, the Design Team chose stress reduction as their second priority.

Although weight loss received the same level of Design Team prioritization votes as sleep, fewer survey respondents indicated that they were ready to lose weight (59%) compared with making other health behavior changes. Therefore, weight loss was decided as the third priority for the Design Team. Finally, the Design Team had decided on an intervention program to address the following three topics, in turn: sleep, stress, and weight loss.

However, because some topics on the list of 10 voted-for health priorities were related or similar in theme, the Design Team began to group priorities together to be as inclusive as possible in addressing these priorities and the problems raised by the survey. The Design Team expanded the first intervention topic on sleep to include other sleep-related topics such as overtime and shiftwork, stress, caffeine use, physical activity, healthy eating, and obesity. They broadened the second intervention to not only address stress management, but also to incorporate the mental health-related topics of emotional well-being and alcohol/substance use. They expanded the third intervention on weight loss to also address the behavioral topics of healthy eating and physical activity, as well as cardiovascular health. The Design Team reached final consensus

that they would develop interventions to address the following three broad topics, in order: sleep quality/quantity, stress management/mental health, and weight loss/healthy eating/physical activity.

DISCUSSION

This study presents the findings from a workforce health assessment survey, which were utilized for prioritizing intervention topics. The survey was developed using participatory design methods and HWPP tools. The primary purpose was to assess the health and well-being of a unionized, public sector workforce of correctional supervisors, and then to identify health topics for intervention. HWPP has been used in previous studies and can be easily adapted and implemented by organizations to improve worker health and well-being. Analysis of survey data collected using the thorough and contextually-relevant workforce assessment also served a secondary purpose, which was to contribute to research by providing deeper knowledge about supervisors' lived experiences of work, well-being, and lifestyle. The presumption was that participatory methods would elucidate an under-researched subject area more effectively than conventional methods.

To inform the selection of three priority health concerns for intervention planning, the Design Team posed two research questions and a hypothesis. They wanted to know which health-related attitudes and behaviors, psychosocial occupational exposures, and outcomes were most strongly associated with general health; whether more junior lieutenants had greater health risk compared with higher-ranked supervisors; and which health behaviors supervisors were most interested in changing. During the process of reviewing survey results, the Design Team employed two other unplanned methods for evaluation: comparing their cohort results to national averages and established norms (when possible), and running post-hoc analyses to examine associations among some variables of particular interest.

Assessment of Workforce Health

Health Outcomes and Health Behavior/Attitudes

Survey results confirmed several health problems raised in our initial focus group study³⁷ showing a high prevalence of overweight/obesity (high BMI) that exceeded national averages⁷³

TABLE 8. List of 10 Health Priority Topics for Intervention

Health Priority Topic for Intervention	No. of Votes
Improving sleep quality/quantity	4
Lowering weight/BMI	4
Reducing stress	3
Reducing alcohol/substance use	3
Improving healthy eating	2
Increasing physical activity	1
Reducing caffeine intake	1
Improving healthy expression of emotions	1
Reducing blood pressure and cholesterol	1
Reducing musculoskeletal pain	1

as well as a reported lack of behavioral adherence to healthy eating and physical activity guidelines. All of these were correlated with poorer overall health. Linked to obesity, poor cardiovascular health affected about a quarter of all supervisors (ie, they reported having high cholesterol and/or hypertension as a chronic health condition). In terms of BMI, although 51% of supervisors fell in the obese category, these results may be inflated given the body structure of many male correctional workers in the population, which is large-framed and muscular. This is because although people with a high BMI are likely to have a body composition with high fat body mass, high BMI can also result from high lean body mass (muscle and bone).⁷⁴ Findings regarding obesity and sleep align with observations from previous studies of obesity^{8,75–77} and sleep deficiencies^{16,78} among corrections workers. Survey findings confirmed concerns about sleep raised in focus groups,³⁷ showing that most supervisors did not get sufficient hours of sleep, and many reported poor quality sleep and difficulty sleeping, all of which were correlated with worse overall health. Lieutenants had poorer sleep quality than higher-ranked supervisors.

Also corroborating focus group conclusions³⁷ were survey findings showing heavy alcohol and caffeine consumption that exceeded national averages. The Design Team noted that caffeine use was correlated with poorer overall health and that alcohol use was higher among lieutenants than higher-ranked supervisors. Our findings support existing research showing heavy alcohol consumption among corrections workers⁸; however further insight could be gained from future research examining factors associated with alcohol use. For example, some research suggests that for correctional workers, drinking alcohol may be used as a form of coping,⁷⁹ which is supported by our post hoc analyses showing links between alcohol consumption and trauma at work. This is also aligned with the experiences reported by Design Team members that after-work drinks with colleagues at local bars often serve as an opportunity to debrief about work stresses and receive social support. More research on alcohol and social support is needed, and could possibly inform future psychoeducational interventions focused on making supervisors aware of healthier forms of coping and social support.

We could not identify other research focused on caffeine use as a health behavior in correctional workers. We found an association between caffeine use and poorer overall health, which may contradict research suggesting that caffeine, a stimulant, has possible benefits (ie, better performance and safety at work).^{80,81} Findings suggested that a third of correctional supervisors in our sample consume excessive amounts of caffeine, as defined by the FDA⁷⁰ Excessive caffeine intake is associated with increased risk of hypertension and cardiovascular disease, as well as nervousness/anxiety, headaches, insomnia, nausea, rapid heartbeat, frequent urination, and muscle tremors.^{82–86} This aligns with our post hoc analyses showing caffeine consumption was related to difficulty sleeping, stress, and psychological symptoms; it was also associated with working more overtime hours. Links between heavy caffeine use and sleep impairment are especially pronounced in extended-shift workers, like those in corrections, who rely on caffeine at work to manage fatigue, stay awake, and improve alertness.⁸⁷ More research is needed on the potentially harmful effects of excessive caffeine consumption, and of new trends in caffeine consumption (eg, energy drinks, synthetic caffeine products) which are popular among corrections workers.

Tobacco use was a health risk raised in our focus group study,³⁷ but survey findings indicated that a relatively small portion of supervisors used tobacco in some form. Chewing tobacco was associated with poorer overall health among supervisors, and over four times higher than the national rate,⁶⁷ while cigarette smoking was slightly lower⁶⁶ than the national average. The Design Team attributed this discrepancy to the DOC policy explicitly prohibiting

cigarette smoking among workers in its facilities—but not smokeless tobacco—and some corrections workers do chew tobacco on the job. As research on tobacco use in correctional settings has almost exclusively focused on health effects of the incarcerated population,^{88–90} these findings contribute to the very limited research available on tobacco use among corrections workers.⁸

An unexpected positive finding was that supervisors held strong attitudes of personal responsibility for one's health, and the overwhelming majority of supervisors reported having a primary care provider and receiving annual checkups with recommended screenings; much higher rates than in the United States population.^{71,72} The Design Team attributed these findings to high supervisor enrollment in the recently-implemented State Employees' Health Enhancement Program, which offered cost-sharing reductions to enrollees who committed to having yearly physicals/wellness visits, recommended screenings and preventive care, two dental cleanings, and disease management programs for conditions including diabetes, high blood pressure, heart disease, asthma, and chronic obstructive pulmonary disorder (COPD).

Attitudes Related to Overtime and Health

Survey findings regarding overtime, and related attitudes about prioritizing income and retirement, provided key insights on health effects. Supervisors worked ~1.5 overtime shifts weekly, and although many thought working less overtime would allow them to be healthier, they felt the need to prioritize earnings over health. Lieutenants reported these attitudes more than higher-ranking supervisors, likely because they worked more overtime. The effect of overtime on well-being is supported by research with corrections workers showing that long hours (>48 hours weekly) are associated with musculoskeletal symptoms,⁹¹ and that work intensity (working 6+ days in a row) is associated with work burnout, likely due to prolonged physical and psychosocial work exposures and insufficient recovery during non-work time.⁹² Further, extended and irregular work hours pose barriers to physical and emotional health, social well-being (ie, family, leisure, community participation), and health behaviors (ie, sleep, nutrition, exercise, weight management).⁹³ Opportunities to work overtime are well compensated and therefore competitively pursued; however there remains a deficient understanding of the root causes of sacrificing health to maximize earnings (particularly among lieutenants). These root causes include financial and gender role pressures in the family (eg, pressure to fulfill the traditional masculine family breadwinner role) and society (ie, economic volatility).

The Design Team noted that although turnover intent was low, work withdrawal was salient. Supervisors frequently thought about retiring (~7 years in the future) and most planned to retire as soon as eligible. Most knew that their job was associated with decreased longevity and thought they would be happier and healthier after retirement. Compared with higher-ranking supervisors, lieutenants more frequently thought about retirement and planned to retire as soon as possible, even though they had a longer wait until retirement. Survey results echoed focus group findings³⁷ in which the decision by supervisors to remain in a job that poorly affected health and mortality was explained as a constrained choice. Working for a limited career (20 years), having an early retirement (often in their 40s), and receiving a lifetime of retirement income and fully-paid-for comprehensive health insurance, was perceived as an acceptable tradeoff in exchange for the occupational risks. This illustrates the influence of the social ecology on health behavior (eg, policy at the organizational, state, and national levels). The DOC wage structure, which allows workers to substantially increase current and retirement income with extensive overtime motivates them to work the maximum possible overtime in their late career because retirement payouts are based on the highest three

earning years. Also, living in the United States, where financial security and full medical insurance are not guaranteed for citizens prior to Medicare eligibility, makes it difficult for workers to turn down a job with post-retirement security in early or late middle age.

Psychosocial Work Exposures and Outcomes

As the focus group study³⁷ suggested, there are various positive aspects of correctional work (eg, high job security, satisfaction) and this was confirmed by survey results. In general, supervisors reported a positive psychosocial work environment (eg, meaningful work, supervisor communication, coworker social support) which correlated positively with general health. This new evidence that positive aspects of corrections work do exist, contrasts with past research (and popular media portrayals) that characterizes it as a stigmatized profession with low occupational prestige.^{94–96} Findings also raise the possibility of publicizing and promoting positive aspects of corrections work (identified by the Design Team³⁷) as a strategy to improve personal and occupational self-esteem, possibly enhancing worker mental well-being.

Survey results related to culture/climate measures (ie, moderate civility climate and masculine culture, relatively high work health climate ratings) are somewhat incongruent with focus group³⁷ concerns about an unhealthy DOC culture. In particular, pressures in the DOC environment to adhere to masculine norms were concerning due to their perceived link with certain health risk behaviors (ie, caffeine consumption, tobacco chewing), traditional gender role pressures (ie, family breadwinner), emotional labor (ie, unwavering displays of strength/control, suppression of emotions), and mental health stigma (discouraging acknowledgement of mental health challenges and help-seeking behavior). Yet survey data provided a subtler picture with moderate ratings of masculine culture and emotional suppression, and moderate-high levels of both social dominance (ie, norms for masculinity) and caring (ie, sociocultural norms for femininity) among both women and men, showing more androgynous (than exclusively masculine) behavior. Survey reporting on gender-related measures may have been influenced by social disability bias, underreporting, or unawareness. The muted depiction could be attributable to the phenomena that in masculine cultures, masculine practices are ubiquitous and grant privilege to people (usually men), who embody and engage in such practices, rendering masculinity invisible to those privileged by it (and highly visible to those without such privilege).⁹⁷

Given the limited research on the effect of a masculine culture on corrections workers (which to date has mainly pertained to inmate experiences^{98,99}), focusing on gender is a promising area for further research, especially given post hoc tests suggesting that social dominance may be a health risk factor, while caring seems to be a protective factor. As we found these associations between norms for gender (femininity, masculinity) and health, rather than sex (female, male) and health, it is noteworthy that socially-constructed gender practices can have health implications for people regardless of their sex.¹⁰⁰ This supports research recommendations to assess both sex and gender in health research, given that social and behavioral differences may influence the risk of developing certain illness more than biological differences.¹⁰¹

Mental Health

Compared with focus group findings which brought up concerns around work stress, trauma exposure, PTSD, and suicide, survey results provided a subtler picture of mental health.³⁷ Stress and burnout were reportedly moderate, but reports of all psychological symptoms were low. Supervisors attributed greater psychological symptoms to their colleagues than to themselves, with hostility being the most severe symptom reported for both self

and others (consistent with masculine emotional expression). Ratings of the effect of traumatic events at work were also low, with respondents reporting being more affected by trauma directed to self/peers than trauma directed to inmates. These low levels could be due to a lack of mental health literacy, a lack of willingness to admit to mental health problems or to caring for inmates (which is contrary to self-presentations of masculine strength), or underreporting resulting from social disability bias within the DOC context, with its high degree of mental health stigma.

Despite muted self-reports in survey measures, other findings point to mental health as a concern. Reducing stress was the health behavior that supervisors were most interested in changing, and our findings suggest that work is a particular source of stress. WFC, which is related to mental well-being (depression, anxiety, alcohol/substance use)^{15,102} was moderate, with work interfering with family more than family interfered with work. Post hoc analyses showed positive correlations between experienced trauma and alcohol consumption. Other post hoc analyses showed that lieutenants were more likely to have chronic anxiety/depression compared to high-ranking supervisors. These findings align with prior research showing that correctional workers have higher rates of anxiety and depression,¹⁰ alcohol and drug abuse,¹¹ and suicide^{9,10} than other work groups, but additional research is needed to identify the root causes of poor mental health and develop acceptable interventions. This may be a challenge, given worker reticence to acknowledge personal mental health difficulties, much less report about them in surveys (even anonymously).²⁴

Focusing on behavior and emotions could provide promising new directions for intervention. Behavior appears to be a driver of conflict because behavior-based WFC and FWC, which occur when behaviors that are effective in one life role are inappropriate in another (eg, when a corrections worker behaves at home in the same rough or aloof manner as at work), were higher than general WFC and FWC. This confirms a focus group concern about the challenge of living in two different worlds (in/out of prison) and managing two personas (work, family).³⁷ More research is needed to identify the worker behaviors that are perceived as problematic (or helpful) at home (eg, we found negative correlations between caring behavior and behavior-based WFC). Post hoc analyses also suggest that emotions play a role, given positive correlations between behavior-based WFC and both emotional suppression and emotional job demands.

Differences in Rank

We found partial support for the hypothesis that supervisors with the rank of lieutenant are at greater risk for poor health than those with the higher rank of captain or counselor supervisor, as the two groups differed on 15 study variables. Differences pertained mainly to lieutenants having poorer health-related attitudes and health behaviors, and more psychosocial occupational exposures. Fewer differences were found in work and health outcomes. Differences were interpreted by the Design Team as resulting from the distinct social location of lieutenants compared with captains and counselor supervisors. In addition to a lower rank in the organizational hierarchy, lieutenants had a lower education level, had fewer years of tenure, were less likely to work the dayshift, and worked substantially more overtime. Moreover, they work on the front line with COs, exposing them to interpersonal conflicts and other stressors that may arise among COs or inmates. Based on these results, the Design Team plans to make special efforts to recruit lieutenants for participation in future health interventions.

Challenges and Lessons Learned

The participatory survey design process was essential in yielding a highly-detailed, comprehensive picture of supervisors' health. The Design Team perceived it to be time-consuming, yet in

the end they were especially satisfied with depth and breadth of the survey results. Another challenge was having numerous survey items representing various domains, which required us to find the optimal way to summarize survey results for the Design Team's review. This is an inherent problem with survey-based research that aligns only with the preferences of the researchers. It was especially helpful for the Design Team to generate specific research questions/hypotheses that they wanted to examine using the data (ie, flagging variables with especially low or high ratings, identifying variables associated with general health, and comparing two supervisor groups of different rank). They also drew comparisons with comparable US population data when possible, and decided to run post hoc analyses when they wanted further detail about interrelations among study variables to inform health priorities.

The use of CBPR and HWPP was particularly helpful in providing a systematic process and evidence-based tools to structure and guide the Design Team's collaborative work, provide momentum, and keep it on track until completion. The CBPR method of involving supervisors in the research process improved our usual survey response rates, promoted diffusion of information about the project within the workforce being surveyed, and generated early interest and buy-in for the interventions that eventually resulted from the health assessment survey.

Using HWPP tools was essential to the Design Team's success. Data from their survey (a customized version of the HWPP All Employee Survey) enabled the investigation of specific research questions and a hypothesis which, combined with discussion generated by the HWPP Prioritizing and Selecting Safety and Well-being Concerns for Intervention Group Activity, helped the team to see patterns among variables that were helpful in deciding priority health topics. Four particular categories were noted, enabling the team to assess whether health intervention topics would be perceived by supervisors as acceptable and appropriate, two key intervention characteristics that can determine whether future implementation is successful.²⁷

Specifically, in their review of the survey findings, the Design Team first noted that some health problems (eg, poor health outcomes and behaviors such as high BMI, poor sleep, use of alcohol, caffeine, tobacco) were recognized as problematic, with supervisors willing to personally report the problems in a survey, and showing some desire to change them. Second, the Design Team found that some perceived problem areas were unexpectedly revealed as strengths (eg, good health behaviors such as preventative healthcare visits, positive psychosocial work exposures such as high coworker support, and positive outcomes such as high job satisfaction) that supervisors acknowledged; these can now be considered resources and assets within the DOC community, and may be built upon to improve health (identifying community strengths is a key CBPR principle³¹). Third, some health problems were personally acknowledged by supervisors as problematic (eg, working overtime to maximize income), but they also showed a deliberate desire not to change their situation due to the rewards associated with the behavior (eg, financial security). Fourth, other problems (eg, links between masculine culture, mental health, alcohol use, work-family conflict) were seen by the Design Team as blind spots among supervisors, not recognized as problematic despite a preponderance of evidence, with supervisors unwilling to personally acknowledge the problems and resistant to changing them, in order to uphold a particular self-presentation (ie, strength, control).

In the end, health issues that affected a large portion of supervisors and fell into the first category—recognized as problematic, admitted to by supervisors, and amenable to change—were seen as the most promising intervention priorities for obtaining workforce buy in. The Design Team thought it would be futile to begin the health intervention program by addressing blind spots or highly intractable attitudes and behaviors such as working excessive overtime for higher incomes; in fact, team members felt that such

change efforts would likely result in backlash against the program. They felt that these more challenging health concerns would require additional time for developing innovative solutions, likely involving educational initiatives to heighten awareness and improve health literacy.

Concerns remain about biased reporting using certain survey measures to convey a socially-desirable self-image, and the Design Team is interested in finding innovative solutions to solve this problem. For example, due to underreporting concerns, the Design Team used two versions of the Brief Symptom Inventory to assess psychological symptoms, an original version that asked supervisors to self-report psychological symptoms, and an adapted version that asked supervisors to report perceptions of other supervisors' experiences of the same symptoms. Supervisors perceived peers as having more severe symptomology, in the same order of magnitude as themselves (hostile, anxious, depressive). This provided insight about the psychological health status of a work group that is reluctant to acknowledge personal or emotional difficulties on surveys, but more work is needed to address underreporting among workers in corrections and similar occupations with masculine cultures and mental health stigma.

Strengths and Limitations

The participatory approach in a unionized public sector workforce is a study strength, although caution should be taken in generalizing findings to private or non-unionized corrections systems. Having a survey designed with input from a large group of supervisors increases the internal validity and applicability of results, ensuring that measures and findings are relevant to our specific population. It also provided a comprehensive picture of the workforce's health. Determining health priorities using a discussion and voting process allowed for informed decision-making and enabled all voices to be heard in an equal way, which is especially beneficial.

However, limitations exist from an epidemiological perspective. This study was cross-sectional in nature and limited to only 37% participation, although we were able to confirm that the survey respondents were representative of the larger population. Healthy worker survivor bias may have influenced the findings if workers who were sensitive to the exposures of the job left the workforce and were not included in the cross-sectional survey. If this were the case, the correlation between poor working conditions and general health may actually be stronger than what was observed in the study.

Also, rather than using multivariate regression models, simple correlations were used to examine relationships. While this limits the ability to take into account correlations between potential exposures, it was important for us to maintain CBPR methods. The Design Team found correlations to be more accessible than sophisticated models and thus they were used to examine relationships. Limitations regarding the survey include measures being adapted from other studies, or having been originally created by the Design Team. This means that some measures require further development and validation, and prevent us from comparing our study findings with those of other studies.

Next Steps

The next step will be to design interventions for the three health priorities in turn, using an HWPP intervention planning tool to brainstorm, evaluate, rank, and select interventions. Design Team discussions thus far favor approaches that are educational, to improve health literacy and self-efficacy, build upon strengths and positive aspects of corrections work to improve self-worth and esteem by others, and capitalize on supervisors' strong sense of personal responsibility for their own health. Another option discussed is obtaining input from DOC supervisors exhibiting "positive

deviance,¹⁰³ who engage in healthy attitudes and behaviors, value a healthy and fit appearance, and prioritize health and longevity over earnings. Finally, the Design Team is considering policies for negotiation during collective bargaining, as many of their discussions focused on policies as an important determinant of health (eg, the DOC tobacco policy that prohibits smoking but not chewing, the retirement policy with payouts based on highest-year earnings, a scheduling policy that enables excessive overtime, the Health Enhancement Program with incentives for preventative healthcare.)

Conclusion

The Design Team successfully used CBPR methods and HWPP evidence-based tools to systematically assess the health of a unionized correctional supervisor workforce in the public sector and select intervention priorities. The findings from the health assessment were instrumental in identifying and ultimately prioritizing health interventions that were important and relevant to the correctional supervisors. These intervention priorities were: improving sleep quality/quantity, stress management/mental health, and weight loss/healthy eating/physical activity. Given the success of this participatory process, several other CPH-NEW projects have adopted the approach in assessing worker health, safety and well-being, with promising results.

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