Developing Strategic Interventions to Reduce Cardiovascular Disease Risk Among Law Enforcement Officers

The Art and Science of Data Triangulation

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RESEARCH ABSTRACT

The purpose of this study was to use data triangulation to inform interventions targeted at reducing morbidity from cardiovascular disease (CVD) and associated risk factors among law enforcement officers. Using the Precede-Proceed Health Promotion Planning Model, survey data ($n = 672$) and focus group data ($n = 8$ groups) from the Milwaukee Police Department were analyzed. Narrative transcripts disclosed that law enforcement officers encounter potential barriers and motivators to a healthy lifestyle. Survey results indicated rates of overweight (71.1% vs. 60.8%) and hypertension (27.4% vs. 17.6%) were significantly ($p \leq .001$) higher among Milwaukee Police Department law enforcement officers than the general population of Wisconsin ($n = 2,855$). The best predictor of CVD was diabetes ($p = .030$). Occupational health nurses are uniquely positioned to identify health risks, design appropriate interventions, and advocate for policy changes that improve the health of those employed in law enforcement and other high-risk professions.

Cardiovascular disease (CVD) is the leading cause of death in the United States (American Heart Association, 2005). Many studies have demonstrated that law enforcement officers have a higher prevalence of some CVD risk factors than the general population (Calvert, Merling, & Burnett, 1999; Franke, Collins, & Hinz, 1998; Franke, Ramey, & Shelley, 2002; Violanti, Vena, & Petralia, 1998; Violanti et al., 2006; Williams et al., 1987) and are consequently at higher risk for disease and death.

The purpose of this study is to use data triangulation to inform policymakers, program developers, and other stakeholders of health issues related to law enforcement. Media portray law enforcement as a high activity and intensity occupation. In reality, for the majority of law enforcement officers, the job is primarily sedentary, punctuated with occasional bursts of unpredictable activity. This reality underscores key issues concerning the increased risk of CVD among law enforcement officers. The sedentary nature, lack of control inherent in unpredictability, and sudden bursts of adrenaline may contribute to CVD risk. In addition, organizational stressors specific to law enforcement may play a role. Increased morbidity among law enforcement officers has been attributed to an increased prevalence of CVD risk factors, including physical inactivity, hypercholesterolemia, hypertension, higher body mass index (BMI), alcohol and tobacco use, and hyperinsulinemia (Franke et al., 1998; Franke et al., 2002; Pyörälä, Miettinen, Halonen, Laakso, & Pyörälä, 2000; Pyörälä, Miettinen, Laakso, & Pyörälä, 2000; Ramey, Welk, Franke, & Shelley, 2003; Smith, Devine, Leggat, & Ishitake, 2005). Furthermore, stress can potentiate several CVD risk factors, including hypertension, elevated cholesterol, and physical inactivity (Franke et al., 2002; Ramey, 2003).

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STRESS AND CVD

Risk factors for CVD have also been correlated with psychological stress (Hemingway & Marmot, 1999; Krantz & McCeney, 2002; Rozanski, Blumenthal, &

Kaplan, 1999). The physiological response may involve neuroendocrine reactions, such as changes in the hypothalamic–pituitary–adrenocortical axis and sympathetic nervous system arousal, that may occur in response to acute, episodic, or chronic stress (Kop, 1999). Corticosteroids and catecholamines subsequently alter the balance of pro- and anti-inflammatory mediators (Black & Garbutt, 2002). These agents are not simply markers of CVD risk; they may be directly involved in the process (Blake & Ridker, 2001; Hansson, 2001; Lusis, 2000; Zebrack & Anderson, 2002). Stress-associated inflammation may be responsible for the CVD seen in 40% of cardiac patients who do not have pronounced conventional risk factors (Black & Garbutt).

The unique and pronounced effects of stress among law enforcement officers are well recognized (Finn & Tomz, 1997). Several studies indicate that organizational stress is significant in law enforcement (Collins & Gibbs, 2003; Garcia, Nesbary, & Gu, 2004; Gershon, Lin, & Li, 2002; Ramey et al., 2003). The general consensus is that organizational factors have the strongest influence of all types of stressors (Brown & Campbell, 1990; Collins & Gibbs). Organizational stressors can take many forms (Ayers & Flanagan, 1992; Biggam, Power, MacDonald, Carcary, & Moodie, 1997; Malone, Denny, Dalton, & Addley, 1997), but no clear consensus exists regarding the most injurious organizational stressors (Liberman et al., 2002).

Although acute stressors (incidents encountered on the job) can markedly affect perceived work stress (Gershon et al., 2002), these nonorganizational stressors are typically short-term. Chronic exposure to organizational stressors may better predict psychological distress, including posttraumatic stress disorder, than acute exposure to stressful incidents encountered on the job (Liberman et al., 2002).

Four major areas of organizational stress have been identified in the literature: vital exhaustion, job strain, effort–reward imbalance, and lack of social support. Vital exhaustion refers to feelings of fatigue, dejection and defeat, irritability, and demoralization (Appels, 1997) and has been associated with CVD (Cole, Kawachi, Sesso, Paffenbarger, & Lee, 1999; Kop, 1999; Prescott et al., 2003).

Job strain (demand vs. control) depends on the interaction between two factors: perceived psychological demands and decision latitude, a concept that combines task control and skill use. Job strain has also been linked to CVD (Karasek, Baker, Marxer, Ahlbom, & Theorell, 1981).

Effort–reward imbalance, or a lack of reciprocity between "costs" and "gains" at work (Siegrist, 1996, 2000, 2001), has been linked to CVD (Kuper, Singh-Manoux, Siegrist, & Marmot, 2002; Peter et al., 1998; Siegrist, Peter, Cremer, & Seidel, 1997).

Lack of social support has been identified as contributing to CVD risk (Hemingway & Marmot, 1999; Kuper et al., 2002). Although often conceptualized as relating to support outside the work environment, perceived lack of social support from peers and supervisors has been identified as a stressor by law enforcement officers (Collins & Gibbs, 2003; Gershon et al., 2002).

Applying Research to Practice

The focus group data support that law enforcement officers encounter organizational stressors including irregular hours, poor diet, unpredictable events, and a hierarchical workplace structure that can be demoralizing and fails to provide adequate acknowledgment of job effort. These stressors clearly contribute to law enforcement officers' higher prevalence of cardiovascular disease (CVD) and related risk factors. The law enforcement officers identified motivational factors such as support of family and coworkers, fear of negative health repercussions, and availability of resources for improving diet and exercise routines. Occupational health nurses need to recognize these patterns and develop interventions to reduce risk factors and morbidity from CVD. Occupational health nurses can make a difference by advocating for systems and policy-level interventions that will positively impact the collective health of law enforcement officers.

The literature provides support for all four forms of work-related stress in law enforcement organizations, and each set of predictors could uniquely explain some of the variance in perceived stress. A conceptual model of how organizational stress and CVD could be related is depicted in the Figure.

METHODS AND RESEARCH DESIGN

Conceptual Framework

The conceptual model (Figure) displays the methods for the study. This model, based on previous evidence-based research, provided direction for the focus group questions and depicted the relationship between organizational stressors and CVD. It complemented the Precede-Proceed Model, which guided the process for planning the study.

Precede-Proceed Health Promotion Planning Model

The Precede-Proceed Model developed by Green and Kreuter (1999) is useful for assessing and creating interventions for this target population (Ramey et al., 2003). It demonstrates three sets of factors that influence behavior: predisposing factors, enabling factors, and reinforcing factors. Predisposing factors include knowledge, beliefs, values, and attitudes. Enabling factors include availability and accessibility of health resources, community or government commitment to health, and health-related skills. Reinforcing factors describe the feedback that a specific action solicits. This feedback may be provided by family members, peers, friends, health care providers, or other decision makers. Reinforcing factors may also include physical consequences of behavior. Success or failure of a health promotion activity may be determined, in part,

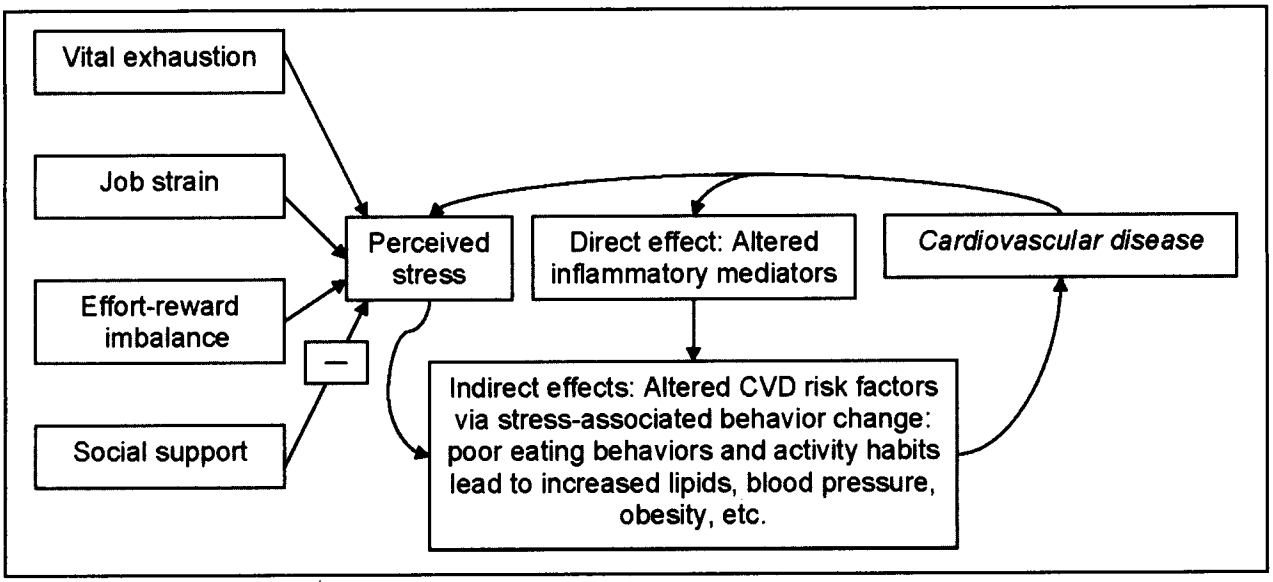

Figure. Conceptual model of organizational stressors and their relationship to cardiovascular disease (CVD).

by the interaction of these three sets of factors. The analysis of these factors is important in both the precede and the proceed aspects of the model.

The precede phase uses this analysis to form an educational and ecological assessment and the proceed phase uses the information to begin the first step of outcome evaluation. In this way, the Precede-Proceed Model is ideally suited to interventions involving organizational stressors; the model uses a systems approach that assesses the organizational environment and informs interventions and evaluation criteria accordingly.

Population, Sample, and Setting

The Milwaukee Police Department employs 1,763 sworn officers of various backgrounds and ethnicities. The ethnic diversity of the department includes: 71.0% White, 16.4% African American, 9.8% Hispanic, 1.4% Native American, 0.8% Asian, and 0.6% "other." Milwaukee is referred to as a "minority majority" city because more than 53% of the city's residents report their race or ethnicity in a category other than White.

In the spring of 2005, the CVD Health Risk Survey was sent to all (n = 1,763) Milwaukee Police Department law enforcement officers. The survey consisted of 50 questions: 36 health related and 14 perceived stress scale (PSS) questions (Cohen, Kamarck, & Mermelstein, 1983). Responses were received from 672 of the 1,763 officers surveyed, a 38% return rate for the study. Of those responding, 77.7% were men and 22.3% were women. The mean age of the officers was 38 years (range = 21 to 59 years). Work experience ranged from 1 to 37 years (M = 12 years). Of those surveyed, 93.9% reported an educational level of 1 to 4 years of college, with 37.9% completing 4 or more years of postsecondary education.

Using the random selection function of SPSS software (SPSS, Inc., Chicago, IL), a pool of potential focus group participants from those 672 law enforcement officers who completed the survey was generated. These officers (n = 100) were invited to participate in focus groups.

Focus Groups

Eight focus groups of 5 to 8 law enforcement officers each convened for approximately 45 minutes at the central-most district located within Milwaukee. Fifty percent of the 100 officers who were randomly recruited participated in the focus groups. The demographics of group participants (e.g., gender, age, and ethnicity) reflected those found in the entire Milwaukee Police Department. All seven districts of the Milwaukee Police Department were represented within the groups. Neither incentives nor gratuities are permissible within the Milwaukee Police Department; however, healthy refreshments were provided at the sessions. Attendance was voluntary and during the officers' own time at the beginning or end of their shifts.

During the group sessions, a research assistant noted nonverbal behaviors, group dynamics, and interactions among members; obtained consent from participants; and tape-recorded the sessions for future transcription. Focus group data were transcribed and coded using NVIVO7 software (QSR International, Melbourne, Victoria, Australia). Theme extrapolation depicting perceived supports and barriers is reflected in Table 1.

The focus groups had the dual purposes of validating data obtained by other methods and generating data that might not be obtainable by other methods (Morgan, 1996). Although this seems paradoxical, a trained focus group moderator can accomplish both by keeping the discussion focused on the topic of interest while also allowing group interaction to develop ideas, expressed by individuals, that might not be generated in an individual interview. This is facilitated by the use of a script (Table 2). At the same time, the moderator uses probing questions to increase the depth of the responses (Frey & Fontana, 1993). Homogeneous groups are important to the

Table 1

Theme Extrapolation Depicting Perceived Barriers and Conceptual Supports to Health Derived From Focus Group Transcripts

Barriers	*Healthy Law Enforcement Officers*	*Supports*
Peers	Physically fit	Administrative support
Lack of administrative support	Mentally fit	Peers
Family roles/pregnancy	Able to cope well	Family
Injury/illness	Able to take care of family	Injury/illness
Lack of adequate exercise equipment	Healthy weight	Physician visits/physical examinations
Fatigue/lack of sleep	Regular hours/routine	Weight-loss program
Stress	Adequate sleep	External presenters
Cost	Exercise	Friends
Irregular hours/lack of routine/lack of time	Outside interests	Self
Overtime/court time	Eats healthy foods	
Limited food choices	Has healthy relationships	
No personal motivation		

process because they facilitate a smooth flow of discussion due to the common framework of the participants (Morgan; Patton, 2002). In addition, the researcher can quickly assess the level of agreement on an issue (Patton). Typically, 4 to 6 focus groups, with 5 to 8 participants each, are necessary to reach data saturation (Morgan). Furthermore, focus groups are invaluable in improving health behavior because they enable assessment of the beliefs of participants and increase their "buy in" (Nyamathi & Shuler, 1990).

The use of focus groups is especially helpful in studying law enforcement officers because of the presence of organizational stressors. Focus groups are useful when a power differential exists between participants and the decision makers in an organization, when a gap exists between the participants and those designing the interventions, when investigating complex behavior and motivation, and when a respectful and noncondescending research method will facilitate participation (Morgan & Krueger, 1993). All of these characteristics apply to law enforcement officers. Focus groups are expected to generate data that are valid because they provide a comfortable setting for individuals to discuss their feelings, beliefs, and perceptions. Furthermore, they are useful in designing interventions because they are generally conducted for applied purposes (Frey & Fontana, 1993).

However, statements made in focus groups cannot be taken at face value (Merton, 2001). Instead, analysis is conducted via triangulation with other data collection strategies. When focus group data are triangulated with other methods of inquiry, this decision-making process can stimulate intervention development.

Table 2

Focus Group Script

What is it about the profession of law enforcement that makes officers more at risk for cardiovascular disease?
Describe a healthy law enforcement officer.
When you think of health, what comes to mind?
What have you done in the past to improve your health?
What worked? What prompted you to do it?
What was *most* important? Family? Friends? Coworkers?
If you receive health information, how would you like to receive it?
We are trying to help people make healthy changes; what advice do you have for us?
If you had 5 minutes with the chief, what would you like her to know?

RESULTS

CVD Health Risk Survey

Survey data indicated that the law enforcement officers in the Milwaukee Police Department are at risk for CVD based on the higher prevalences of 5 of 8 risk factors than those found in the general population, who completed the Behavioral Risk Factor Surveillance System, a telephone survey conducted annually in all

Table 3

Cardiovascular Disease Risk and Morbidity in the Milwaukee Police Department Compared With the General Population of Wisconsin

	2005 Milwaukee Police Department Law Enforcement Officers (n = 672)		*2004 BRFSS General Population (n = 2,855)*	
	No. (Total)	*%*	*No. (Total)*	*%*
Hypertension	174 (636)	27.4	502 (2,855)	17.6*
Hypercholesterolemia	175 (614)	28.5	623 (2,220)	28.1
Diabetes	20 (645)	3.1	113 (2,820)	4.0
Tobacco use	207 (644)	32.1	1,409 (2,852)	49.4*
Overweight (25–29.9)	300 (644)	46.6	1,038 (2,752)	37.7*
Obese (> 30.0)	161 (644)	25.0	635 (2,752)	23.1
Cardiovascular disease	18 (647)	2.8	37 (1,342)	2.8
Physical inactivity	72 (641)	11.2	500 (2,854)	17.5*

BRFSS = Behavioral Risk Factor Surveillance System.
*$p \leq .001$.

Table 4

Sources of Organizational Stress Identified in Focus Group Transcripts

Vital Exhaustion	*Job Strain*	*Effort–Reward Imbalance*	*Lack of Social Support*
Lack of routine	Negative world view	Lack of recognition	Conflict with supervisors
Irregular hours	Futility		Punitive events/discipline
Overtime/court time	Altercations with the public		Lack of support from peers
Lack of adequate rest/sleep	Heavy workload		Family conflicts related to work
Feeling rushed	Lack of control		
Difficulty leaving work behind			
Low morale			

50 states by the Centers for Disease Control and Prevention (2005) (Table 3). Logistic regression results showed diabetes (3.1%) was the best predictor of development of CVD ($p = .030$). The mean score for the PSS was 20.33, slightly higher than that found among officers employed by state patrols in nine Midwestern states (19.19) (Franke et al., 2002).

Focus Group Narrative Anecdotes

Participants described impressions of what constitutes a healthy law enforcement officer, including the barriers, motivators, and supporters they perceive contribute to law enforcement officer health (Table 1). A healthy law enforcement officer was one who was "physically and mentally fit, able to cope well, and take care of family." Law enforcement officers identified adequate sleep, having a routine, healthy relationships, outside interests, exercising, and eating healthy foods as important to health. Participants reported that the reality of being a law enforcement officer presents obstacles to achieving the markers of health they identified. For example, irregular work hours, lack of routine, and fatigue made it difficult to establish healthy diet and exercise regimens. A variety of motivators were identified, including support from family, friends, and peers; advice from health care providers; external presenters; weight-loss programs; and personal motivation. A few participants related that having an injury or illness motivated them to make changes in their health behavior. However, the overall impression of the participants was that their attempts to make healthy changes were often sabotaged by the "nature of the job." In addition, law enforcement officers were aware of the anecdotal evidence suggesting they die shortly after retirement.

We hear a lot of things about life expectancy after retirement; it is 5 years on average for police officers. And we always hear about that [in] roll call when some retired member dies. There are a lot of times you hear about it, and guys who we knew who retired 4 years ago [are] dying off. You have to start looking at why they are dying. What kind of condition were they in?

Organizational stressors inherent in law enforcement emerged from the focus group data and are categorized in Table 4. Issues related to vital exhaustion were prominent, with an overall impression that time management was beyond the control of most law enforcement officers. A feeling of "being rushed" was prevalent and stress related to unpredictable overtime was a factor in this phenomenon. Officers related being unable to predict whether an event would occur at the end of their shift that would prevent them from leaving work on time or cause them to complete paperwork past the end of their shift. Comments were made regarding the tension between wanting to be a "good" law enforcement officer by getting involved in law enforcement proceedings and desiring to avoid doing so because of the extra paperwork and court time that might result.

You don't get time to finish one thing to the next . . . . You are trying to make these decisions. You are trying to make them quick. You are trying to move on to the next thing. If you do have to write up or make an arrest, you have to compile a lot of reports in a short period of time, so there's the pressure of constantly making a lot of these decisions. And then, all of a sudden, you are done with your shift and it's like you don't want to do much; you just want to crash.

Lack of sleep was a concern. Those who had families expressed the difficulty of balancing family and work life and its impact on their ability to take care of their health. Difficulty in leaving work behind was mentioned as a source of stress, as well as allusions to low morale among law enforcement officers.

I'm on a low-carb diet, which has gone well for me . . . but I got up this morning, I needed some energy. I had only a couple of hours of sleep. I had a huge bowl of cereal, which is way off the healthy diet. But it's just that a couple of hours of sleep—I couldn't give a darn about anything.

Job strain was discussed primarily in the context of unpredictable events involving the public and the perception of having to follow procedures correctly to avoid reprimand. Participants reported a negative world view due to handling criminal behavior; this impacts their lives even when they are off duty. They reported having to be constantly aware of following proper procedures, even in sometimes violent and volatile situations. Lack of control over events and policies represents lack of decision latitude to address demands.

A big thing is being able to use discretion. Do I make the arrest or . . . try to deal with this—is it going to come back and haunt me? Am I going to get in trouble? It's very difficult to make those decisions. It's in the training—to view everybody as a suspect. In doing that, you have to follow certain guidelines and procedures.

Incidences of effort–reward imbalance included situations in which law enforcement officers believed they had handled a particularly stressful event well and then were reprimanded for not following a procedure correctly or for completing paperwork that did not satisfy their supervisors. Lack of recognition by supervisors contributed to stress in these participants.

It was a long chase and was a total of 13 minutes while I was behind him, stopped him, recovered all the drugs. Three days later an administrative representative (who hasn't been on the street for a long time) sits there and says, 'Why was it so long?' And I'm kind of like, we catch this criminal, get at least four charges that are going to stick, and all you can do is sit there and [play] Monday morning quarterback?

Lack of social support from supervisors, peers, and family was mentioned as contributing to stress. Excessive paperwork, feeling unappreciated by superiors, and being undermined in attempts to make healthy choices were discussed. Family conflicts related to work issues also contributed to stress.

Well, he was my superior and he took a particular dislike to me. He had me so wound up that I slept 2, 3 hours a day. I mean, I had to take melatonin to help me get some sleep. Just horrible, horrible; the bosses are in the paper shuffle business and they forget about the people.

Participants related how they would like to receive health information. Roll call, at the beginning of every shift, and videotaped speakers were not considered good ways to receive information. In-services during on-duty time that include live speakers, handouts, and mailings sent to the home so that family could be involved were acceptable methods voiced by the law enforcement officers. Participants stated they would be most receptive to hearing success stories directly from other law enforcement officers. Annual fitness checks and one-on-one health counseling were also mentioned as ways to receive personal health information.

Finally, participants were provided with half sheets of paper at the end of the focus group sessions and asked to write an answer to the following question: "If you had 5 minutes with the chief, what would you like her to know?" The most frequent responses were to have workout equipment available at all districts, provide incentives for being physically fit, implement fitness standards, offer annual physical examinations, allow more time for meal breaks, and encourage more positive interactions between peers and between law enforcement officers and supervisors. The following comments typified those written by the law enforcement officers:

- *Like the Federal Bureau of Investigation, we should be given time at work to work out. If safety is important, then we need to be fit.*
- *Mandate a weight limit/physical fitness test so officers will think twice about eating fast food every day, sometimes 3 times a day.*
- *Provide an adequate amount of time for lunches during patrol—20 minutes does not do it. How can I get to the station, microwave my food, and eat it within that time frame?*

Table 5

Sample Newsletter Excerpt

The Milwaukee Police Department Health Beat—Little tips for big health!

Did you know that heart disease is the #1 cause of death in the United States? Did you also know that law officers are at a higher risk of heart disease than the general population? Making small changes in your diet and physical activity can make a BIG difference!

Exercise tip: Take the stairs whenever possible. This small activity will burn more calories than taking an elevator or escalator.

Nutrition tip: If fast food is your only option, make a healthier choice.

Stay away from French fries—a large order of fries from McDonald's is 570 calories and 30 grams of fat!

Choose a basic sandwich—a McDonald's cheeseburger has 300 calories versus a Quarter Pounder with cheese, which has 510 calories.

Note. *Data regarding McDonald's retrieved April 30, 2007, from www.mcdonalds.com/usa/eat/nutrition_info.html.*

- *If supervisors were less standoffish, officers would be more relaxed and it would reduce complaints. Officers would be happier at work and more open to change.*

DISCUSSION

The main findings from the survey were: (1) the prevalence of hypertension among the active Milwaukee Police Department officers exceeds that found in the general population of Wisconsin; (2) the prevalences of overweight and obesity are excessive in the law enforcement officer group (Table 3); and (3) diabetes is the best predictor of the development of CVD. The mean PSS score was slightly higher than that found in other law enforcement agencies. It is apparent from the themes extrapolated from focus group transcripts that, in part, the stress experienced by law enforcement officers may be related to organizational stressors.

The law enforcement officers recognized that many of the barriers to being healthy are inherent in law enforcement; they are part of "the nature of the job," as one participant stated. Irregular work hours and unpredictable events are perhaps elements of law enforcement that cannot be changed. These comments were helpful to contextually frame the written survey results.

In triangulating survey data with themes extrapolated from the focus groups, it is important to consider that the prevalence of CVD risk factors may in fact be higher than is evident in this survey due to several factors. First, the results are based on a self-report survey. Some respondents did not know whether they had elevated glucose levels or hypercholesterolemia.

Further, these data may represent the "healthy worker effect" in that law enforcement officers tend to retire earlier than other workers and before symptoms of disease can interfere with performance. Hypertension and increased BMI may actually be the best indicators of CVD risk in this study because they are values that are more likely to be known by respondents and, when present singularly, are not conditions usually associated with symptoms that prevent law enforcement officers from performing their duties. Other limitations of the results presented here include neither the focus groups nor the survey data can be generalized to other groups due to the homogeneous nature of the profession, and survey respondents and focus group attendees were predominately White men.

Nonetheless, focus groups and survey data from this study have been helpful in contemplating interventions framed by the Precede-Proceed Health Promotion Planning Model. Narrative anecdotes from the officers provided possible explanations for the PSS mean being slightly higher in this study sample.

Proactive solutions to improve health may be possible through systems and policy-level interventions. Interventions designed using data from several sources, including surveys, focus groups, and interviews, might help "give voice" to the law enforcement officers. However, statements made in focus groups cannot be taken at face value. Therefore, it is important to triangulate and consider the relevance of these statements with other data sources before drawing conclusions. Although the survey identified potential health issues and quantified the level of perceived stress, the comments made by the officers identified several strategies to improve health. These included providing incentives such as compensated time or pay for working out, paid gym memberships, and bonuses for a positive fitness test. Provision of new or improved exercise equipment at precincts was suggested.

To improve diet, law enforcement officers suggested increasing the 20-minute lunch breaks, allowing law enforcement officers to go outside their patrol area for meals, building a 24-hour cafeteria in the district headquarters, and stocking healthier foods in the vending machines. Implementing interventions like these may help decrease the prevalence of several CVD risk factors.

Participants also stated that providing annual health screenings at the precinct would increase awareness of health risks and motivate officers to make healthier choices. Suggestions from the law enforcement officers need to be analyzed and considered when developing interventions. Although diet and exercise may improve health in the short-term, other intervention strategies are necessary long-term. Long-term strategies could include working

with administration to increase awareness about how organizational stressors affect the health of law enforcement officers and identifying resources within the organization that support interventions. Development of systems and policy-level interventions to address sources of organizational factors that enable or reinforce poor health behavior is another strategy.

Although knowledge acquisition alone may not produce change, creating awareness can be the first step in encouraging behavior change efforts. Other studies provide evidence for this. For example, Getliffe, Crouch, Gage, Lake, and Wilson (2000) used this premise to formulate a hypertension awareness and screening program. Gates, Brehm, Hutton, Singler, and Poeppelman (2006) studied the impact of a worksite-based wellness program targeting the prevention and reduction of obesity. The authors used Roger's Theory of Diffusion of Innovations, focusing on addressing factors that impact behavior adoption (e.g., level of commitment, complexity, and observability). Without personal awareness of the impact of behavior on health status, individuals cannot begin to take effective levels of action (Mosca et al., 2006). This is supported by the current study finding that some law enforcement officers are motivated to make health behavior changes after an injury or illness, indicating that an awareness of physical health status can be a strong motivator.

Although the focus group participants perceived barriers and supports (Table 1) to a healthy lifestyle, most were not yet actively engaging in risk reduction and health promotion activities. Therefore, the first phase of interventions for the Milwaukee Police Department will focus on increasing awareness. This might be accomplished by distributing a monthly health newsletter (Table 5), offering blood pressure, glucose, and cholesterol screenings at quarterly in-service training meetings, and arranging for law enforcement officers to share their success stories during work hours. Evaluation of the process and outcomes will be accomplished by using the three levels of evaluation in the Precede-Proceed Model.

Future work with this target population includes exploring the effects of stress on body composition measured beyond BMI and exploring stress mediators within the profession of law enforcement. This and subsequent studies will continue to lay the groundwork for the development of systems and policy-level interventions directed toward long-term reduction of risk and morbidity from CVD within law enforcement organizations.

Occupational health nurses should identify health risks, design appropriate interventions, and advocate for policy changes to improve the health of those employed in law enforcement and other high-risk professions.

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