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Police stressors and health: a state-of-the-art review

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Abstract

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Purpose —The purpose of this paper is to provide a state-of-the-art review on the topic of police stressors and associated health outcomes. Recent empirical research is reviewed in the areas of workplace stress, shift work, traumatic stress, and health. The authors provide a comprehensive table outlining occupational exposures and related health effects in police officers.

Design/methodology/approach —A review of recent empirical research on police stress and untoward psychological and physiological health outcomes in police officers.

Findings —The results offer a conceptual idea of the empirical associations between stressful workplace exposures and their impact on the mental and physical well-being of officers.

Research limitations/implications —A key limitation observed in prior research is the cross-sectional study design; however, this serves as a motivator for researchers to explore these associations utilizing a longitudinal study design that will help determine causality.

Originality/value —This review provides empirical evidence of both mental and physical outcomes associated with police stress and the processes involved in both. Research findings presented in this paper are based on sound psychological and medical evidence among police officers

Keywords

Resilience; Psychological health; Post-traumatic stress disorder; Law enforcement; Traumatic events; Work schedules

Introduction

Approximately 806,400 sworn police officers and 17,784 agencies in the US face the formidable task of enforcing the laws of a democratic society (www.bls.gov/ooh/protective-service/police-and-detectives.htm). Stress permeates this task, taking a toll on the health of persons who work in this occupation (Webster, 2014). This review includes searches of relevant databases (years 1990–2016) including PubMed, Scopus, Embase, ProQuest, PsycINFO, PILOTS, and Google Scholar. Articles were included if they specifically investigated associations between police work exposures and health-related outcomes.

Stress

Stress is a general rubric used to describe physiological change or impact brought about by environmental stimuli and psychological mediation (Semmer *et al.*, 2004; Levi, 2004; McEwen, 1998; Webster, 2014). Stress is a biosocial process, where environmental stimuli place an undue strain on an organism (Theorell, 2004). Police work involves stressful demands such as dealing with human misery, abused children, and instantaneous life or death decisions. Additionally, the burden of societal responsibility and strict legal norms are placed on officers as they deal with these demands.

The police stress environment

Sources of stress in policing may be classified into two general categories (Shane, 2010): those arising from “job content” which include work schedules, shift work, long-work hours, overtime and court work, and traumatic events and threats to physical and psychological

health; and those arising from “job context” also called organizational stressors, which refer to characteristics of the organization and behavior of the people that produce stress (e.g. bureaucracy and co-worker relations). These sources of stress often come with a price. Exposure to human suffering and death may also result in a negative view of life, as well as psychological effects such as post-traumatic stress disorder (PTSD) (American Psychiatric Association, 2013), depression, and suicide ideation (McCanlies, Miller, Andrew, Wirth, Burchfiel, and Violanti, 2014; Austin-Ketch et al., 2012; Violanti *et al.*, 2009; Ma *et al.*, 2015). Rotating shifts often lead to inadequate sleep for officers which lowers physiological resistance to stress (Baughman *et al.*, 2014; Bond *et al.*, 2013). Family life may be disrupted by shift work schedules, working holidays, and strained relationships (Kirschman *et al.*, 2014; Torres *et al.*, 2003). One can add to this array of occupational exposures the recent negative public image that police face, resulting in public loss of confidence in police integrity (President’s Task Force on 21st Century Policing, 2015).

Traumatic events

Among the many stressful experiences police officers are exposed to in their line of work, exposure to traumatic events (e.g. violence, seeing dead bodies, abused children, etc.) may produce some of the highest stress levels (Korre *et al.*, 2014). Studies have shown that exposure to stressful life events in the general population can change brain structure, resulting in decreases in gray matter volume in the bilateral anterior cingulate and the hippocampi (Papagni *et al.*, 2011; Smith, 2005).

Several longitudinal studies reported significant relationships between traumatic incidents experienced at work and PTSD in police officers (Huddleston *et al.*, 2007; Stephens and Miller, 1998; Maguen *et al.*, 2009) (Table I). Huddleston *et al.* (2007) found that police recruits who had experienced one or more on-duty traumatic events had mean impact of event scale scores 64 percent higher than recruits who had experienced no on-duty traumatic events. Robinson *et al.* (1997) found that any encounter with death was the strongest predictor for total PTSD symptomatology among US police officers. Trauma experienced on-duty as a police officer was shown to be more strongly related to PTSD symptoms than trauma experienced while off-duty (Stephens and Miller, 1998). Also, in a case-control study of officers with and without PTSD symptoms, trauma severity was the only predictor of PTSD symptoms (Carlier *et al.*, 1997).

Results of studies conducted in New Zealand and some European countries show that exposure to traumatic events increase the likelihood of psychological distress (Brough, 2004; Brown *et al.*, 1999; Leino *et al.*, 2011; Renck *et al.*, 2002). In a cross-sectional study of Finnish police officers and security guards, Leino *et al.* (2011) reported positive associations between exposure to work-related violence and symptoms of psychological distress, and between threats by a deadly weapon and symptoms of distress. In Sweden, investigators found that officers who worked at the scene of a fatal fire experienced higher stress levels than those working at hospitals where the injured were taken (Renck *et al.*, 2002). Police who were exposed to traumatic incidents have also been found to have higher levels of depression and anxiety (Hartley *et al.*, 2007; Martin, Marchand, Boyer, Martin, 2009; Strahler and Ziegert, 2015).

Exposure to traumatic events has been associated with hyperarousal or hypervigilance (McCaslin *et al.*, 2006; Covey *et al.*, 2013; Anderson *et al.*, 2002). The type of critical incident experienced was associated with degree of hypervigilance. McCaslin *et al.* (2006) found that when the critical incident was categorized as duty-related violence, officers had higher mean hyperarousal symptom scores than their colleagues whose critical incident involved exposure to civilian death. Another study reported that the highest levels of stress in law enforcement occur just prior to and during critical incidents (Anderson *et al.*, 2002). Compared with those who did not experience a critical incident, officers who did, experienced elevated heart rates which dropped with recovery after the critical incident, although rates did not return to their previous levels. Talking to suspects after experiencing a critical incident elicited the highest heart rates (virtually double, or +23 beats per minute) above pre-incident levels, maintaining a state of hypervigilance.

Associations between traumatic events and sleep quality and quantity were examined among police officers in the Buffalo Cardio-metabolic Occupational Police Stress study (Bond *et al.*, 2013). In men, significant associations were found for the “shooting of another officer” with sleep quality and sleep disturbances. In women, seeing more “abused children” was associated with poorer sleep quality; increasing frequency of “seeing victims of a serious traffic accident” was associated with shorter sleep duration; and increased frequency of “seeing dead bodies” was associated with both poorer sleep quality and shorter sleep duration. A significant inverse association was found between seeing seriously injured victims of traffic accidents and poor sleep quality among women with a high vs low workload. In another cross-sectional study, cumulative critical incident exposure was associated with nightmares but only weakly associated with poor sleep quality among police officers (Neylan *et al.*, 2002).

Repeated exposure to traumatic events was shown to affect performance among police officers, depending on the type of incident (Levy-Gigi *et al.*, 2016). Results showed that trauma-unexposed civilians performed better in low (relative to high) aversive conditions. When the authors compared performance of officers who had repeated traumatic exposure to that of unexposed civilians in conditions of low intensity, they found poorer performance among the trauma-exposed officers. When performance of the two groups in conditions of high intensity were compared, officers with repeated traumatic exposure performed better than unexposed civilians. Therefore, repeated traumatic exposure had both positive and negative consequences on police officers’ reactions to job situations.

Other than work sited in this review, few studies have been identified that investigated associations between exposure to traumatic events at work and chronic diseases (e.g. cancer, cardiovascular disease (CVD), mortality, etc.) in police officers. Results of studies utilizing non-law enforcement populations have shown that exposure to traumatic stress is associated with higher prevalence of CVD and eyesight degeneration (Gallo *et al.*, 2014; Karatzias *et al.*, 2015; Walczewska *et al.*, 2011). Research on effects of traumatic events on chronic health conditions in police officers is warranted.

PTSD

Symptoms of PTSD include re-experiencing trauma, avoidance, negative cognitions and mood, and arousal often manifested by aggressiveness, sleep problems, recklessness, or self-destructive behavior (American Psychiatric Association, 2013). PTSD rates in officers have been reported to be as low as 7 percent and as high as 19 percent (Schutte *et al.*, 2012; Violanti 2014). In comparison, PTSD rates in the US were approximately 8 percent (Kessler *et al.*, 1995; American Psychiatric Association, 2013). Partial or subsyndromal PTSD, defined by presence of some, but not all of the PTSD symptoms were found to interfere with normal work and social functioning (Stein *et al.*, 1997). Subsyndromal PTSD rates were as high as 34 percent in police officers, potentially compromising their day-to-day functioning as well as their health.

Individuals with PTSD symptoms, or those who report having experienced a trauma, are more likely to have conditions such as chronic fatigue syndrome, fibromyalgia, gastrointestinal disorders, autoimmune disorders, and chronic pain syndromes as well as experience a number of comorbid psychological conditions, including depression, suicidal ideation, substance abuse, and social phobias (McCanlies Miller, Andrew, Wirth, Burchfiel, and Violanti, 2014). It is not surprising that officers with PTSD symptoms also report reduced quality of life, poorer health, increased sick leave, more frequent medical appointments, and higher hospital admissions compared to officers without PTSD symptoms (Maia *et al.*, 2007; Martin, Marchand, and Boyer, 2009). Furthermore, officers who were exposed to multiple traumatic incidents experienced more severe symptoms compared to those who reported relatively few traumatic events (Breslau *et al.*, 1999; McCanlies Miller, Andrew, Wirth, Burchfiel, and Violanti, 2014).

There are unique individual factors that may influence whether an individual develops PTSD symptoms. Protective factors, such as social support, resiliency, gratitude and satisfaction with life have been shown in prior studies to be associated with fewer PTSD symptoms (Andrew *et al.*, 2014; McCanlies, Mnatsakanova, Andrew, Burchfiel, and Violanti, 2014; Paton and Norris 2014). Conversely, exposure to prior trauma, maladaptive coping styles, and low neurocognitive abilities have been associated with increased risk of PTSD (Marmar *et al.*, 2006; DiGangi *et al.*, 2013).

Suicide

A recent web-based surveillance study on police suicide in the US was conducted involving 55,000 suicide-specific news articles (O'Hara *et al.*, 2013). Descriptive data were obtained for 102 suicides in 2008, 104 in 2009, and 92 in 2012. The percentage of suicides among male and female officers was relatively stable across these three years. On average, 92 percent of suicides occurred among male officers and 6 percent among female officers. Using data from the National Occupational Mortality Surveillance System, there were 264 suicides among law enforcement officers in 1999, 2003–2004 and 2007 (Violanti, Robinson, and Shen, 2013). This represented a significantly higher proportionate mortality ratio for suicide than expected (PMR 169, 95 percent CI = 150–191, $p < 0.01$).

Organizational stressors and health outcomes

Organizational stressors which include the organizational setting or design (e.g. management-autonomy, flexibility, participation in decision making, etc.) may be a greater source of stress for police officers as they represent daily routines. However, they are less studied compared to operational stressors which dominate the literature. A recent study of police officers showed that two specific organizational stressors “fellow officers not doing their job” and having “inadequate or poor quality equipment” were among the top five of 60 most frequently occurring stressors (Violanti *et al.*, 2016). A more detailed examination of the impact of operational vs organizational stressors on police performance (Shane, 2010) showed that 45 percent of the variance in police performance is attributable to organizational stressors and the mean scores of organizational stressors were significantly higher compared to mean scores of operational stressors. A recent systematic review also revealed similar findings of the impact of organizational stressors on job stress and burnout (Finney *et al.*, 2013).

Organizational stressors could lead to negative physiological and psychological responses in officers including CVD (Goh *et al.*, 2015; Kivimäki and Kawachi, 2015). A meta-analysis of workplace stressors and health outcomes showed that organizational stressors, such as work-family conflict, job insecurity, high job demand, low job control, and lack of social support, were associated with poor physical health, poor mental health, and physician-diagnosed morbidity (Goh *et al.*, 2015). The study also showed that high job demands raised the odds of having a physician-diagnosed illness by 35 percent. Another study reported that job strain increased the likelihood of CVD by 23 percent (Kivimäki *et al.*, 2012). However, literature on associations between organizational stressors and health outcomes is limited among police officers. Understanding the impact of organizational stressors on health and performance of police officers is important as it enables policy makers to weigh the magnitude of the effect which could ultimately lead to recommendations for an intervention (Hartley, Violanti, Sarkisian, Fekedulegn, Mnatsakanova, Andrew, and Burchfiel, 2014).

Few epidemiological studies have investigated associations of stress with metabolic syndrome (MetSyn) in law enforcement. Perceived stress was positively associated with prevalence of MetSyn (Janczura *et al.*, 2015), and police work-related stress was associated with the number of MetSyn components (Hartley *et al.*, 2011). This association has also been observed in a longitudinal study (Garbarino and Magnavita, 2015). However, the significant association was not replicated in a study conducted in Iowa department of public safety officers (Yoo *et al.*, 2009).

Work schedules

Shift work, a necessity in police work, is considered to be one of the most difficult job requirements which is associated with adverse health outcomes in police officers (Violanti *et al.*, 2009; Zimmerman 2012; Ramey *et al.*, 2012). Using work history for the past month, year, and 15 years, night and evening work schedules were consistently associated with elevated prevalence of poor sleep quality (Fekedulegn *et al.*, 2016). Undiagnosed sleep disorders may pose health and safety risks (Barger *et al.*, 2009). One study reported several

health conditions in a group of US officers that included sleep disorders, diabetes, depression, and CVD (Rajaratnam *et al.*, 2011). Officers with sleep disorders reported making serious administrative errors, falling asleep while driving, making errors or safety violations due to fatigue, showing uncontrolled anger toward suspects, having higher rates of absenteeism, and falling asleep during meetings more frequently than police officers without a sleep disorder (Rajaratnam *et al.*, 2011).

Night shift work among police officers was significantly associated with long-term injury (Violanti, Fekedulegn, Andrew, Charles, Hartley, Vila, and Burchfiel, 2013) and elevated incidence of sick leave (Fekedulegn *et al.* 2013). A combined field and laboratory study of police officers indicated that alertness, vigilance, and simulated driving performance were significantly diminished following five consecutive night shifts (Waggoner *et al.*, 2012). Actual post-shift driving performance showed that officers working in the night shift performed worse than those working in the day shift (James and Vila 2015). Long-term night shift work (six to eight years) was associated with decreased average level and total volume of cortisol released over the waking period compared with the afternoon and day shift (Fekedulegn *et al.*, 2012).

Shift work is associated with risk factors for chronic disease. Officers who worked in the night shift and either had less than six hours of sleep or worked more overtime had a four-fold greater number of MetSyn components than officers working in the day shift (Violanti *et al.*, 2009). A significant post-shift increase in systolic blood pressure (BP) was observed in female officers, and overall, BP and fatigue levels were strongly related (Elliott and Lal, 2016). Frequent day/night rotations might give rise to insulin resistance and oxidative stress (Demir *et al.*, 2016). Night shift work was associated with decreased kidney function among urban white/Hispanic officers. Stratification by body mass index (BMI) resulted in a significant association only among officers with a BMI of 25 kg/m² or higher (Charles *et al.*, 2013).

Suicide ideation was more prevalent among urban policewomen with increased depressive symptoms and an increasing percentage of hours worked on the day shift, and among urban policemen with higher PTSD symptoms and an increasing percentage of afternoon shift hours (Violanti *et al.*, 2008).

Police officers who are shift workers require a longer recovery time and sleep duration than non-shift working officers (Garbarino, Nobili, Beelke, Balestra, Cordelli, and Ferrillo, 2002). Shift work tolerance has been primarily related to sleep quality followed by a need for recovery, level of fatigue, and work-life balance (Lammers-van der Holst and Kerkhof, 2015b). Sleep/wake complaints and subjective health in police officers in a flexible (self-determined) shift system were not different than those in a rapidly rotating shift system, but they did obtain longer rest periods between shifts and more sleep (Eriksen and Kecklund, 2007). Circadian adaptation to night shift work was associated with better performance, alertness, mood, and more sleep (Boudreau *et al.*, 2013). Adaptation was also demonstrated in increasing and later decreasing cortisol awakening response in young novice police officers between 4 and 14 months after beginning rotating shift work (Lammers-van der Holst and Kerkhof, 2015a) Physicians should be attentive to possible sleep disorders in

shiftworking police officers and health promotion programs should attempt to reduce chronic stress (Garbarino, De Carli, Nobili, Mascialino, Squarcia, Penco, Beelke, and Ferrillo, 2002; Gerber *et al.*, 2010). Fatigue management programs should include education, screening for sleep disorders, and interventions on health consequences (Barger *et al.*, 2009).

Policing and family

Work stressors can impact not only the officer, physically and psychologically, but also those around them – co-workers, family and friends. Officers experiencing high levels of stress are more likely to disengage from family activities and have marital troubles (Jackson and Maslach, 1982). Alexander and Walker (1994) found that over 40 percent of police officers reported taking out their stress on family. Burke found that factors, such as shift work, lack of support, and marital difficulties, were strongly related to increased levels of work-family conflict in police officers, and, in turn, work-family conflict was positively associated with numerous work and health outcomes (Burke, 1988). Mikkelsen and Burke (2004) found that work-family conflict was higher in younger officers and those regularly engaged in shift work. Officers reporting more work-family concerns had significantly more subjective health complaints and higher suicide ideation (Mikkelsen and Burke, 2004). A high percentage of police spouses reported experiencing stress due to the officer's job, including shift work, overtime, fear of the officer being hurt or killed, and the officer sharing too little or too much about their job with them (Finn, 2000).

Female police officers may be more adversely affected by work-related stressors and work-family conflict issues than male officers. Female officers continue to comprise a small, yet increasing, percentage of officers in the USA (11.6 percent in 2013) (Crime in the United States, 2013). The percentage decreases as the police agency size decreases, falling to 7.4 percent among agencies in non-metropolitan counties. As discussed in Hartley, Mnatsakanova, Burchfiel, and Violanti (2014), female officers experience unique stressors including concerns over their ability and skill to perform their duties compared to male officers, sexual harassment, discrimination, lack of support within the police agency, and increased work-family conflict.

One approach to reducing stress is to provide or increase support. The police culture has traditionally been resistant to accepting emotional support, even viewing it as risky and interfering with the officer's reputation and job duties (Evans *et al.*, 2013). Humor, on the other hand, has been a widely accepted form of coping, as it preserves the masculine or macho appearance typically associated with policing (Evans *et al.*, 2013). Yet, some officers prefer to discuss difficult or challenging events with others who may have similar experiences (Waters and Ussery, 2007). Peer support is particularly important to women and minority police officers who have encountered numerous obstacles in joining a traditionally white male occupation (Hartley, Mnatsakanova, Burchfiel, and Violanti, 2014). Officers may also seek support from family and friends as a vehicle for more serious conversations (Evans *et al.*, 2013). Seeking support from non-police connections is not without limitations: from the officer, the concern about the individual's ability to understand and cope with the details,

and from family and friends, feelings of discomfort and worry about the officer's safety (Waters and Ussery, 2007).

Conclusion

This paper presented much of the recent research on police stress and health. To date, however, we do not yet know the long-term effects of health as affected by stress in police work. When we are able to provide prospective analyses of health and psychological factors in this occupation, we will be in a better position to isolate policing as an agent of untoward outcomes. Exposure and job socialization have a profound impact on police officers, and future research should include etiologic studies that can evaluate potential occupational factors that lead to increased risks (O'Hara *et al.*, 2013; Violanti, Fekedulegn, Hartley, Andrew, Gu, Burchfiel, 2013). Based on the results of this review, we can with some assurance state that police work serves as a fertile arena for assessment of the health consequences of stress. We may be better informed for preventive actions if we know the inherent risk of police stress in a multi-dimensional quantitative, qualitative, and contextual sense.

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Table I.

Studies investigating stressful occupational exposures and their outcomes in police officers

Outcomes	Exposures Work schedules	Traumatic events, PTSD	Organizational stressors
1. Sleep disorders	^e Barger <i>et al.</i> (2009) (USA) ^a Garbarino, De Carli, Nobili, Mascialino, Squarcia, Penco, Beelke, and Ferrillo (2002), Garbarino, Nobili, Beelke, Balestra, Cordelli, and Ferrillo (2002) (Italy) ^a , ^b Rajaratnam <i>et al.</i> (2011) (North America)	^a Bond <i>et al.</i> (2013) (USA) ^a Neylan <i>et al.</i> (2002) (USA)	
2. Metabolic syndrome	^a Violanti <i>et al.</i> (2009) (USA)		^a Janczura <i>et al.</i> (2015) (Poland) ^b (Garbarino and Magnavita (2015) (Italy) ^a Hartley <i>et al.</i> (2011) (USA) ^a Yoo <i>et al.</i> (2009) (USA)
3. CVD risk factors (e.g. heart rate, obesity, hypertension, etc.)	^a Demir <i>et al.</i> (2016), Ramey <i>et al.</i> (2009), Zimmerman (2012) (Turkey) ^a Elliott <i>et al.</i> (2016) (Australia) ^a Ramey <i>et al.</i> (2012) (USA) ^e Zimmerman (2012) (USA)	^a Anderson <i>et al.</i> (2002) (Canada)	^a Shane (2010) (USA) ^b Kivimaki <i>et al.</i> (2012) (Finland) ^e Kivimaki and Kawachi (2015) (Finland) ^a Hartley, Violanti, Sarkisian, Fekedulegn, Mnatsakanova, Andrew, and Burchfiel (2014) (USA) ^a Violanti <i>et al.</i> (2016) (USA)
4. Cortisol	^c Fekedulegn <i>et al.</i> (2012) (USA) ^b Lammers-van der Holst <i>et al.</i> (2015a) (Netherlands)	Witteveen <i>et al.</i> (2010) (USA) Strahler and Ziegert (2015) (Germany)	
5. PTSD		^a Robinson <i>et al.</i> (1997) (USA) ^b Carlier <i>et al.</i> (1997) (The Netherlands) ^b Maguen <i>et al.</i> (2009) (USA) ^a Maia <i>et al.</i> (2007) (Brazil) ^a Stephens and Miller (1998) (New Zealand)	^b Maguen <i>et al.</i> (2009) (USA) ^a Martin, Marchand, Boyer, Martin (2009) (Canada)
6. Neurological disorders		Levy-Gigi <i>et al.</i> (2016) (Israel) ^a Covey <i>et al.</i> (2013) (USA)	
7. Depression		^a Martin, Marchand, and Boyer (2009) (Canada) ^a Hartley <i>et al.</i> (2007) (USA)	

Outcomes	Exposures Work schedules	Traumatic events, PTSD	Organizational stressors
8. Burnout/psychosomatic symptoms/hypervigilance		^b Huddleston <i>et al.</i> (2007) (New Zealand) ^a Leino <i>et al.</i> (2011) (Finland) ^a McCaslin <i>et al.</i> (2006) (USA) ^a Covey <i>et al.</i> (2013) (USA)	^e Finney <i>et al.</i> (2013) (USA)
9. Psychological strain		^a Brough (2004) (New Zealand) ^a Brown <i>et al.</i> (1999) (UK) ^c Renck <i>et al.</i> (2002) (Sweden)	Webster (2014)
10. Subclinical CVD (e.g. atherosclerosis, endothelial function, etc.)			
11. CVD (e.g. myocardial infarction, heart failure, etc.)			
12. Other chronic diseases	^a Charles <i>et al.</i> (2013) (USA)		
13. Mortality			
14. Suicide ideation	^a Violanti <i>et al.</i> (2008) (USA)		
15. Injuries	^a Garbarino, De Carli, Nobili, Mascialino, Squarcia, Penco, Beelke, and Ferrillo (2002), Garbarino, Nobili, Beelke, Balestra, Cordelli, and Ferrillo (2002) (Italy) ^c Violanti, Fekedulegn, Hartley, Andrew, Gu, Burchfiel (2013); Violanti, Robinson, and Shen (2013); Violanti, Fekedulegn, Andrew, Charles, Hartley, Vila, and Burchfiel (2013) (USA)		
16. Sleep quality and duration	^a Fekedulegn <i>et al.</i> (2016) (USA) ^d Boudreau <i>et al.</i> (2013) (Canada) ^a Elliott <i>et al.</i> (2016) (Australia) ^a Gerber <i>et al.</i> (2010) (Switzerland) ^a Lammers-van der Holst <i>et al.</i> (2015b) (Netherlands)		
17. Fatigue	^a Elliott <i>et al.</i> (2016) (Australia) ^d James <i>et al.</i> (2015) (USA)		
18. Absenteeism/leave time	^a Fekedulegn <i>et al.</i> (2013) (USA)		
19. Sleepiness	^d Waggoner <i>et al.</i> (2012) (USA)		

Outcomes	Exposures	Work schedules	Traumatic events, PTSD	Organizational stressors
	^a Eriksen <i>et al.</i> (2007) (Sweden)			
	^a Garbarino, De Carli, Nobili, Mascialino, Squarcia, Penco, Beelke, and Ferrillo (2002), Garbarino, Nobili, Beelke, Balestra, Cordelli, and Ferrillo (2002) (Italy)			

Notes: Work schedules include shiftwork, long-work hours, overtime work, and second job; traumatic events include exposure to dead bodies, witnessing police suicide/homicide, violent confrontations, situations of abuse, riot control, seeing battered or dead children, serious accidents and hostages, failed resuscitation attempts, and assistance in disasters; organizational stressors include lack of supervisor and/or co-workers support, job strain, effort-reward imbalance, lack of supervisor feedback, workplace discrimination, excessive paperwork, lack of recognition, dealing with the public, and perceived stress.

^a cross-sectional study;

^b prospective study;

^c retrospective study;

^d experimental study;

^e meta-analysis or systematic review