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Promoting productive workplaces through safety and health research 

Working Hours, Sleep, & Fatigue Forum

Abstract for Vulnerable Populations Sector

Work-related Fatigue: A Hazard for Vulnerable Workers (Extended version)

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Key Messages

1. Working hours, sleep, and fatigue, are significant occupational safety and health issues for vulnerable working populations including young workers, immigrant workers, and small business employees.
2. There is an increasing focus on non-traditional occupational safety and health issues among vulnerable worker populations, and this provides an opportunity for researchers to address work-related fatigue and working hours among workers in high-risk populations.
3. Interventions to address work-related fatigue among specific vulnerable worker groups should also take into account the multiple other vulnerable groups that workers may belong to.

Introduction

Many workers experience different levels of risk of being injured at work, even when they have the same job. Beyond differential hazard exposure, other factors can make some workers more vulnerable than others to workplace illness or injury, including demographic factors such as age; social dynamics such as race, class, and gender; economic trends such as the growth of the temporary workforce; and organizational factors such as business size. The term occupational health disparities refers to increased rates of work-related illness and injuries in particularly vulnerable populations [Centers for Disease Control and Prevention (CDC) 2011]. Vulnerable populations are often described using a single characteristic (age, race, income, employment, etc.) [Cutter et al. 2005]. There is broad evidence of occupational health disparities related to sleep duration among U.S. workers, as Whites have been reported to have a lower prevalence of short sleep duration than Blacks or persons of other races [Luckhaupt et al. 2010]. While there have been focused efforts to address occupational health disparities, as well as efforts to address long working hours and fatigue, there is limited research that addresses work-related fatigue among specific, vulnerable worker groups. This presentation will review the limited research specifically addressing fatigue among certain vulnerable worker groups, and discuss potential approaches to integrating fatigue management into interventions.

Burden

Among the various groups of workers who experience occupational health disparities, young workers, immigrants, and small business employees are of particular interest to NIOSH researchers. In the United States, young workers under the age of 25 comprise roughly 13% of the U.S. labor force and are injured at almost twice the rate of adults [CDC 2011]. Youth under the age of 18 are a particularly vulnerable group [Rauscher and Myers 2016]. Numerous developmental and environmental factors predispose young people to job injury [Sudhinaraset and Blum 2010; Runyan and Zakocs 2000; NIOSH 2013]. Researchers have identified work-related fatigue as a potential hazard to working youth [Laberge et al. 2011; Sudhinaraset and Blum 2010; Teixeira et al. 2006].

It is estimated that immigrants will comprise approximately a quarter of the U.S. working population by 2050 [Pew Hispanic Center 2008]. Hispanic immigrant workers endure a higher burden of occupational injury and fatality than do U.S.-born Hispanic, non-Hispanic, and non-immigrant workers [CDC 2008]. Immigrants often work in “3D” (dirty, dangerous, and demeaning) jobs [Connell 1993] and jobs considered to be high-risk [Baron et al. 2013], with less standard schedules and that are generally more physically demanding. In addition to their work in dangerous jobs, a substantial proportion of Hispanic farmworkers experience levels of sleepiness that places them at risk for occupational accident or unintentional injury. [Grzywacz et al. 2011; Sandberg et al. 2012]. Similar to the U.S., migrant workers across Europe and in Canada are more likely to be exposed to certain working and employment arrangements that may place them at higher risk of future health problems, including working >10 hours/day, working >5 days/week, on Sundays, and not being able to take days off [Ronda et al. 2013; Otero and Preibisch, 2010]. Although workers often agree to these hours out of financial need, they also fear that refusing to accept long shifts will jeopardize their jobs [Otero and Preibisch, 2010].

In 2010, firms with fewer than 500 workers accounted for 99.7% of all businesses in the United States, and businesses with fewer than 20 workers accounted for 89.8% of the total number of firms [U.S. Census 2011]. Evidence suggests that employees of smaller businesses experience a disproportionate burden of occupational injuries, illnesses, and fatalities. Previous research has found that employees from smaller businesses may face increased exposure to physical hazards [Morse et al. 2004], and numerous studies report a linear, inverse relationship between organization size and reports of injury, illness, and/or fatality [Buckley et al. 2008; Mendeloff et al. 2006; Morse et al. 2004; Page 2009; Peek-Asa et al. 1999], as well as an association with longer duration of work-related disability. Small businesses are also more likely than larger businesses to hire workers who are at a greater risk for occupational injury, including young workers, people who are less educated, and immigrants [Belman and Levine 2004]. While little research attention has focused on working hours of small business employees, there is evidence to suggest long work hours coupled with poor sleep characteristics are synergistically associated with increased risk of workplace injury among employees in small firms [Nakata et al. 2010].

Need and Impact

The impact of long working hours and fatigue among young workers, immigrants, and small business employees is not well understood, largely due to a lack of fatigue research specifically focused on vulnerable worker groups. While several occupational safety and health issues have been given greater priority for vulnerable worker groups (e.g., physical and chemical hazard exposure) [NIOSH 2018] there is a need for both more research to develop the body of knowledge regarding the burden of long working hours and fatigue among vulnerable worker groups, as well as a need for research to develop effective interventions to address these OSH hazards.






For example, few studies focus specifically on fatigue in young workers and its impact on their OSH outcomes [Laberge and Ledoux 2011]. Thus, there is a need for exploration of opportunities to integrate additional content related to working hours, sleep and fatigue into young worker trainings and interventions, including the NIOSH young worker curriculum (*Talking Safety*) [NIOSH 2015]. *Talking Safety* has been shown to have a positive, significant impact on middle school students' occupational safety and health (OSH) knowledge, attitudes, self-efficacy, and intention [Guerin et al. 2019]. The curriculum is currently taught in middle schools and high schools across the United States, and is now promoted through legislation enacted in Oklahoma [OK S.B. 262, 2015]. Adaptations of training to deliver the foundation OSH skills taught in *Talking Safety* are also being developed for other vulnerable worker populations, including temporary workers and new workers (e.g., career and technical education students in high schools). These adaptations may provide additional opportunities to address working hours, sleep and fatigue among populations of particularly at-risk workers.


For Hispanic immigrant workers, there have been calls to address mental health and wellbeing in national surveillance systems [National Academies 2018], and current NIOSH research is taking a more holistic approach to immigrant OSH issues to consider threats to wellbeing beyond traditional OSH hazards, including consideration of work arrangements. Thus, there is increasing opportunity to explore the impact of factors such as work hours and fatigue among this vulnerable worker group. Additionally, there is a growing recognition that members of various vulnerable worker groups are also members of one or more additional vulnerable groups. For example, in 2013, about 40% of the approximately 1.5 million Hispanic

immigrants working in construction worked in firms with fewer than 10 employees [NIOSH, ASSE 2015]. Thus, intervention research aimed at reaching any particular vulnerable group should also consider the additional high-risk group memberships which may be encountered.


The potential impact of developing effective interventions to address fatigue among these vulnerable groups is significant and wide-reaching. Yet, such efforts will likely be extremely challenging as many of the barriers associated with occupational health disparities are beyond training needs, and will likely require changes at the policy and cultural level [Ahonen et al. 2017]. Given young workers are at the beginning of their working life, developing good habits will contribute to good health throughout their careers. With the projected increase in the proportion of Hispanic immigrants in the workforce, efforts to address fatigue among these workers could effect as much as one quarter of U.S. workers. And, given the overwhelming majority of firms are small, developing interventions to address fatigue among small employers could have wide-reaching impact on the health and productivity of the U.S. economy.


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