A Biopsychosocial Analysis of High Suicide Risk Occupational Groups

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Abstract

With the trend of rising workplace suicide, the study explores the relationship between the country's suicide rates and the workers' occupational groups. The biopsychosocial perspective was employed to examine the influence of a worker's body, mind, and environment in relation to their occupation. The occupational groups included in the scope of this research were the first-responders, armed forces, and the construction and extraction field. This paper highlights that income, work hours, and societal prestige were not consistent factors that notably contributed to workplace suicide. Instead, it argues that workplace suicide is significantly influenced by unstable job environments. Disruptive social fabrics showcase high demands with low control; this is exhibited in circumstances wherein workers experience high pressure or in situations that lack managerial support. These social factors affect individuals psychologically and biologically, which commonly leads to comorbidities in psychological disorders and substance abuse. As this research analyzes patterns present in the working conditions of occupational groups highly at risk of suicide, I realize that the workplace is still an underutilized avenue to advocate for mental health. Thus, this research offers a perspective on understanding occupational risk factors to potentially serve as a basis in employing protective factors at the workplace.

Keywords: workplace suicide, occupational risk factors, protective factors, biopsychosocial perspective, disruptive social fabric

Introduction

Statement of the Problem

This research paper discusses workplace suicide in the United States, particularly uncovering the patterns exhibited by the occupational groups that are highly at risk for suicide. Previous research conducted by mental health organizations and suicide statistics institutions has studied suicide statistics with respect to the demographics based on age, gender, race/ethnicity, and socioeconomic status. With the recent rise in suicide among the working-age population, the highly vulnerable industries and occupational groups have gained attention as a relatively new area of study. In line with the upward trend of workplace suicide, the direction of this research focused on the relationship between occupational groups to suicide.

Significance of the Study

Through this study, the researcher aims to identify patterns present in various occupational groups that are highly at risk for suicide. These patterns will provide insight into the risk factors associated with certain occupational groups. Moreover, these risk factors are applied to understanding generalized dynamics of working conditions and environments. This analysis will potentially serve as a foundation in proposing recommendations of protective working factors to combat risk factors leading to workplace suicide.

Review of Related Literature

Workplace Suicide

Workplace suicide is an alarming concern in the United States, with its record of a 40% increase in less than two decades (Peterson, et al., 2016). Along with the general increasing trend of suicide, it is worth noting that the majority of suicides occur in the working-age population from ages 16 to 64 years old. This is in line with the findings that a substantial percentage of those who commit suicide were employed at the time of their death (Thomas, 2018). To illustrate the severity, there were more deaths noted from suicide as compared to incidents in aircraft, electrocution, explosions, and fires combined (Burdick, 2018).

Background: The Relevance of Work to an Individual

The evolution and distinction of human beings from the animal world are attributed to work. It is recognized as an inseparable part of our lives, which serves as a means to fulfill our needs and responsibilities in society (Górny, 2018). In a macro-perspective delving into economics, work is essential as it builds an organization for human activity to create products and services that are necessary for society's functioning (Hajder, 2012). During the process and cycle of producing work, individuals inevitably acquire cultural and social attitudes with co-workers or the values of their workplace's institution (Furmanek, 2013).

Human work is purposeful in the sense that it carries value in itself and contributes to personal development. Work is an opportunity for individuals to fulfill their higher needs in Maslow's Hierarchy of Needs. The workplace is an avenue to satisfy belongingness amongst peers, esteem needs through the relevance of work, and self-actualization through professional development (Pt & Low, 2018).

While work intends to provide satisfaction through professional fulfillment, it is also a common source of frustration and dissatisfaction (Hajder, 2012). These negative attributions are plausible results from the social pressure that is built upon the responsibilities that workers have to fulfill (Oleksa, 2010). Thus, it can hinder the levels of esteem and/or self-actualization.

The World Health Organization (2018) supports foundational studies that work is good for an individual's [mental] health; it also clarifies that it is particularly the negative working conditions that are rather harmful to one's physical and mental health. In light of the acknowledgments regarding the challenges in the workplace, it is believed in the present day that work should not be detrimental to human health (Górny, 2018).

Efforts in Health and Safety

In an effort to address challenges in the workplace, several advancements have worked towards the improvement in the access, accommodations, and treatment of individuals with physical disabilities. While these are all forms of progress in social and cultural attitudes and practices, there is still stigma and a lack of proper accommodations in the workplace when it comes to individuals suffering from psychological disorders. In fact, the worldwide leading cause of disability is depression. However, mental health issues are still taboo in the workplace, as it is perceived as "ill-defined, complex, and controversial" (Bender & Kennedy, 2004).

The Centers for Disease Control and Prevention (CDC) published the article Job Strain, Long Work Hours, and Suicidal Thoughts to raise awareness during the National Suicide Prevention week in 2018. The article highlighted that the discussion on workplace [mental] health and safety is still severely underrepresented despite the increasing rates of workplace suicide. Therefore, greater efforts are necessary to continuously provide adequate support to individuals with mental disabilities. Furthermore, research regarding the relationship between occupational groups in relation to workplace suicide needs to be more thoroughly explored.

Occupational Groups

This research utilized the Standard Occupational Classification from the United States Bureau of Labor Statistics. The data below is derived from the Morbidity and Mortality Weekly Report (MMWR): Suicide Rates by Industry and Occupation – National Violent Death Reporting System, 32 States, 2016.

Based on the data Table 1 from the National Violent Death Reporting System, researchers Peterson et al. (2020) observed that five major industry groups reported a notably higher suicide rate in comparison to the total study population. These industry groups are the following: (1) Mining, Quarrying, and Oil and Gas Extraction in males; (2) Construction in males; (3) Other Services such as automotive repair in males; (4) Agriculture, Forestry, Fishing, and Hunting in males; (5) Transportation and Warehousing in males and females. From these industry groups, there is a higher concentration of male workers affected by workplace suicide. This fact is not questionable since males have been generally found to have a significantly higher suicide rate as compared to females (Tsirigotis, K., Gruszczynski, & Tsirigotis M., 2011).

This paper takes into account the major industries susceptible to suicide to have a broader perspective in this research, but it specifically focuses on the occupational groups that are highly at risk of suicide. Peterson et al. (2020) report these occupational groups to be the following: (1) Construction and Extraction among males and females; (2) Installation, Maintenance, and Repair among males; (3) Arts, Design, Entertainment, Sports, and Media among males; (4) Transportation and Material Moving among males and females; (5) Protective Service among females.

Before this research identifies patterns coexisting across the major occupational groups, it considers one of the limitations presented by the National Violent Death Reporting System. This limitation pertains to the following being excluded from the study: unemployed descendants, military or unpaid workers, or individuals older than 64 years old. Among the mentioned demographics, the only group relevant to this research is the military. Thus, this paper conducted further research on the occupational groups not represented in the Morbidity and

Mortality Weekly Report. The background information covered occupational groups also at high risk for suicide, including the military and armed forces as discussed below.

Census code[¶]	Major group	Sex rate (95% CI) Male	Female
Total	**All industries or occupations**	**27.4 (26.9–27.9)**	**7.7 (7.5–8.0)**
Industry			
0170–0290	Agriculture, Forestry, Fishing, and Hunting	36.1 (31.7–40.5)**	NC[††]
0370–0490	Mining, Quarrying, And Oil and Gas Extraction	54.2 (44.0–64.3)**	NC
0770	Construction	45.3 (43.4–47.2)**	9.4 (6.5–13.2)
1070–3990	Manufacturing	23.6 (22.5–24.8)	7.3 (6.3–8.2)
4070–4590	Wholesale Trade	11.8 (10.1–13.5)	NC
4670–5790	Retail Trade	21.3 (20.0–22.6)	6.8 (6.1–7.5)
6070–6390	Transportation and Warehousing	29.8 (27.8–31.9)**	10.1 (7.9–12.8)**
0570–0690	Utilities	26.3 (21.9–30.7)	NC
6470–6780	Information	19.6 (16.9–22.3)	6.7 (4.7–9.1)
6870–6990	Finance and Insurance	15.1 (13.3–16.8)	6.0 (5.0–6.9)
7070–7190	Real Estate and Rental and Leasing	16.6 (13.8–19.4)	7.1 (5.0–9.7)
7270–7490	Professional, Scientific, and Technical Services	17.6 (16.2–19.0)	6.4 (5.4–7.3)
7570	Management of Companies and Enterprises	NC	NC
7580–7790	Administrative and Support and Waste Management Services	25.9 (23.7–28.1)	5.2 (3.9–6.7)
7860–7890	Educational Services	9.3 (8.1–10.4)	3.9 (3.4–4.4)
7970–8470	Health Care and Social assistance	18.7 (17.0–20.4)	7.5 (7.0–8.0)
8560–8590	Arts, Entertainment, and Recreation	27.4 (24.0–30.8)	9.7 (7.4–12.4)
8660–8690	Accommodation and Food Services	22.9 (21.2–24.6)	7.8 (6.9–8.7)
8770–9290	Other Services	39.1 (36.1–42.0)**	8.8 (7.5–10.0)
9370–9590	Public Administration	23.1 (21.1–25.1)	7.5 (6.2–8.8)
Occupation			
0010–0430	Management	17.5 (16.4–18.6)	5.7 (5.0–6.5)
0500–0950	Business and Financial Operations	11.5 (10.0–13.0)	4.7 (3.8–5.5)
1000–1240	Computer and Mathematical	16.2 (14.5–17.9)	6.4 (4.5–8.9)
1300–1560	Architecture and Engineering	23.2 (20.6–25.7)	8.2 (4.7–13.4)
1600–1965	Life, Physical, and Social science	21.4 (16.3–27.6)	5.3 (3.0–8.6)
2000–2060	Community and Social Service	15.4 (11.7–20.0)	6.2 (4.7–8.2)
2100–2160	Legal	16.3 (12.1–21.7)	7.9 (5.4–11.2)
2200–2550	Education, Training, and Library	9.9 (8.3–11.6)	3.9 (3.3–4.6)
2600–2960	Arts, Design, Entertainment, Sports, and Media	32.0 (28.2–35.8)**	8.8 (6.7–11.5)
3000–3540	Healthcare Practitioners and Technical	23.6 (20.8–26.3)	8.5 (7.6–9.4)
3600–3655	Healthcare Support	23.6 (17.0–32.1)	10.6 (9.2–12.1)**
3700–3955	Protective Service	26.4 (23.7–29.1)	14.0 (9.9–19.2)**
4000–4160	Food Preparation and Serving Related	21.1 (19.2–22.9)	7.8 (6.7–8.8)
4200–4250	Building and Grounds Cleaning and Maintenance	26.7 (24.4–29.0)	6.9 (5.3–8.7)
4300–4650	Personal Care and Service	25.0 (21.2–28.8)	8.4 (7.2–9.5)
4700–4965	Sales and Related	20.7 (19.3–22.1)	7.1 (6.3–7.8)
5000–5940	Office and Administrative Support	14.2 (12.9–15.5)	5.4 (4.9–5.9)
6000–6130	Farming, Fishing, and Forestry	31.4 (25.6–37.1)	NC
6200–6940	Construction and Extraction	49.4 (47.2–51.6)**	25.5 (15.7–39.4)**
7000–7630	Installation, Maintenance, and Repair	36.9 (34.6–39.3)**	NC
7700–8965	Production	27.5 (25.9–29.2)	6.8 (5.6–8.1)
9000–9750	Transportation and Material Moving	30.4 (28.8–32.0)**	12.5 (10.2–14.7)**

Abbreviations: CI = confidence interval; NC = not calculated.
* Per 100,000 civilian, noninstitutionalized working persons aged 16–64 years.
† Alaska, Arizona, Colorado, Connecticut, Georgia, Hawaii, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, Maryland, Massachusetts, Michigan, Minnesota, New Hampshire, New Jersey, New Mexico, New York, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, Utah, Vermont, Virginia, Washington, and Wisconsin.
§ Number of suicide decedents = 15,779.
¶ Census Bureau 2012 industry and 2010 occupational codes from the 2016 American Community Survey, translated from National Institute for Occupational Safety and Health Industry and Occupation Computerized Coding System codes using Census Bureau definitions (https://www.census.gov/topics/employment/industry-occupation/guidance/code-lists.html).
** Statistically higher than population rate (all industries or occupations) based on 95% CI of industry or occupational group rate not containing the total population rate point estimate.
†† NC indicates that rate was not calculated because the number of decedents was <20.

Table 1:Suicide rates classified by major industries and occupational groups (Peterson, et al., 2020)

Military

The military was historically reported to have lower suicide rates in comparison to the general population in the country. However, the past decade showed a steady increase in suicide rates among service members and veterans (Uniformed Services University, n.d.). In 2020, a 30% increase in suicides among the active-duty Army was recorded. Pentagon's annual report states that the suicide rate among active-duty troops was 25.9 per 100,000 troops. The comparison of suicide rates in the past year showcases an upward trend with 24.9 per 100,000 in 2018, 21.9 per 100,000 in 2017, 18.5 per 100,000 in 2014 (Brook, 2020).

As suicide has become the second leading cause of death in the U.S. military, both the general public and professional field have growing concerns (Uniformed Services University, n.d.). In 2019 specifically, suicide rates of military services per category follow as (1) 29.8 per 100,000 in the Army, (2) 25.3 per 100,000 in the Marine Corps, (3) 25.1 per 100,000 in the Air Force, and (4) 21.5 per 100,000 in the Navy (Brook, 2020).

First Responders

In addition to the military that exhibited high suicide rates, first responders also have traces of battling suicide in their profession. A white paper authorized by the Ruderman Family Foundation claimed that first responders, including police officers and firefighters, have a higher likelihood of dying by suicide than in their line of duty. This was supported by the 2017 figures of 103 firefighter suicides and 140 police officer suicides, whereas there were 93 firefighters and 129 police officers who died in the line of duty that year (Heyman, et al., 2018).

Factors Influencing the Demographics Vulnerable to Workplace Suicide

Background of General Work Stressors

The earlier sections of this research discussed the impact of work on one's esteem and self-actualization. Many individuals in the working-age population attribute their work to their worth. The internal and external pressure that they experience is better coined in the term psychological stress, which is defined as " a state of being, resulting from the tension experienced by the imbalance between what is demanded and what is offered to meet that demand" (Cherniss, 1980). While this pressure and stress immediately interferes with one's work, it has more severe effects on a long-term basis.

The research Job Strain, Long Work Hours, and Suicidal Ideation in US Workers: A Longitudinal Study investigated chronic psychosocial work stressors that can heighten the workers' suicidal ideation. These stressors include the following: job strain, supervisor and coworker support, job insecurity, job control, and work hours (Mitchell & Choi, 2018). Job strain is characterized as a combination of low job control and high job demands, and long working hours are measured at more than 40 hours per week. This research took into account Mitchell and Choi's proposed chronic psychosocial work stressors and used it as a guideline for analyzing the occupational groups in a later section, the Discussion.

Multiple research studies dating back from the 1900s to the present day emphasize the stress that workers experience due to high demands and low control. Constant stress does not only impede the workers' health and performance on a short-term or trivial matter, but it can lead to burnout. Beneder and Kennedy (2004) claim that burnout has become an accepted disability from an employee's perspective, but it is still not recognized as a "medical disability". Thus, it is less taken seriously nor provided with adequate support in the workplace.

Research Framework

This research aims to address the influence of occupational groups on workplace suicide. It follows a biopsychosocial approach wherein it considers a holistic perspective of health. The research discusses the health effects that occupational groups influence including the workers' physical state, social relations, intrapersonal thinking, and behaviors. With various occupational groups at high risk for suicide, the scope of this research will focus on three occupational groups namely the first responders, armed forces, and the construction/extraction field.

Thesis

Workers who are exposed to unstable job environments are more likely to commit suicide.

Discussion

Inconsistencies among Occupational Groups

Upon analyzing the different working conditions of the occupational groups, the researcher initially identified inconsistencies and areas that lack a strong connection. These factors pertain to the following: income, work hours, and societal prestige.

In terms of income, the occupational groups that were highly at risk for suicide for men and women covered a wide range in terms of financial matters. Some top occupational groups such as workers in the entertainment field or protective services relatively have a high income; on the other hand, other occupational groups specifically in manual labor do not have a high starting or average pay.

Work hours were inconsistent. The researcher found that working overtime was not a predominant factor in influencing suicide rates. While some workers in the occupational groups such as construction workers and first-responders regularly worked overtime, some occupations had a flexible schedule. Many workers in the arts, design, and media were freelancers or managing their own brands that tailored to their own schedule. Lastly, some occupational groups fell into the conventional working hours of 40 in a week.

The third inconsistency the research points out is the societal prestige that workers receive from their occupational groups. The intangible construct of societal prestige is based on conventional standards, beliefs, and treatment that society practices. Some top occupations at risk for suicide are highly valued and respected in society; however, this does not necessarily prevent them from being susceptible to suicide. For instance, first-responders are recognized as one of the most essential and respectable jobs but are still highly vulnerable to suicide. Meanwhile, occupational groups that are not conventionally applauded such as manual labor in the construction and extraction field also have high suicide rates.

Understanding these inconsistencies provide better insight into clarifying causations attributed to workplace suicide. As this area of study is still underrepresented, some misconceptions involve associating low income with a higher likelihood of suicide. However, this research emphasizes that income is not a significant contributing factor to workplace suicide. It acknowledges that financial responsibilities and burdens can play a role as a confounding variable to an individual's personal life, but it does not serve as a variable in collectively representing the workers' conditions. This finding also aims to dismantle the idea that financially comfortable and successfully recognized workers are almost immune to committing suicide. As news of famous entertainers or artists committing suicide often comes as a puzzling surprise to the public, this research stresses that factors of income, working hours, and societal prestige do not significantly influence major occupational groups at risk for suicide.

Patterns among Occupational Groups

Aside from identifying inconsistencies or areas that lack strong connections, this research found patterns that illustrate biopsychosocial stressors among the different occupational groups. Workers who are exposed to unstable job environments are more likely to commit suicide. Disruptive social fabrics showcase high demands with low control; this is exhibited in circumstances wherein workers experience high pressure or in situations that lack managerial support. These social factors affect individuals psychologically, as workers in disruptive conditions are vulnerable to developing Common Mental Disorders such as anxiety and depression (Chopra, 2009). Additionally, workers that perform physical labor are susceptible to drug use to alleviate physical pain or injury from work (Shaw, et al., 2020). Both psychological and biological effects can be in comorbidity with other disorders (Bender & Kennedy, 2004).

Disruptive Environment in the Military

According to the Uniformed Services University, the common stressors that influence the high suicide rates in the military include traumatic brain injury, chronic pain, and sleep disorders. In addition to the biological influences, suicide is a result of mental illness including depression and PTSD; these stem from constant exposure to death and destruction" (Heyman, et al., 2018). This is in line with the findings of the research in Suicide in the Workplace: A Troubling Trend; it claims that "social contagion" occurs in the workplace. This refers to the potential of an individual's co-worker's suicide to cause trauma and distress, which can be linked to other workers' suicides (Burdick, 2019). This is especially relevant in the case of the military, as deaths of fellow military members or even strangers could cause severe distress.

Disruptive Environment in First Responders

Similar to the military, first responders also experience trauma and distress. Police officers witness about 188 critical incidents during their careers (Heyman, et al., 2018). This exposure to trauma can lead to several forms of mental illness. For example, PTSD and depression rates among firefighters and police officers have been found to be as much as 5 times higher than the rates within the civilian population. These mental illnesses can also be found in comorbidity with sleep disorders such as insomnia. Due to these psychological disorders, first responders commit suicide at a considerably higher rate than the general population. The suicide rate of firefighters is recorded to be 18 per 100,000; the suicide rate of police officers being 17 per 100,000; the general population's suicide rate being 13 per 100,000. Even when suicide does not occur, untreated mental illness can lead to poor physical health and impaired decision-making.

Disruptive Environment in Construction and Extraction Workers

The disruptive environment experienced by construction and extraction workers is primarily caused by the lack of managerial support. Workers were provided with unclear expectations and conflicting messages. The lack of communication in deadlines, work shifts, and changes in work plans cause the workers' stress, and they feel a lack of control over what they can do or how they can do it (Spruce, 2017). Table 2 below shows the different signs of stress experienced by construction workers. As categorized below, physical signs, psychological signs, and behavioral signs of stress are all exhibited. This reflects the biopsychosocial perspective, which this research direction aimed to employ.

As observed in the table below, the high stress levels make workers prone to experiencing anxiety, distress, depression, and suicidal feelings (Spruce, 2017). Furthermore, it is worth noting that manual laborers like construction and extraction workers are susceptible to substance abuse due to stress and/or anxiety. Others also use drugs such as opioids to alleviate physical pain and injury from work (Shaw, Roelofs, & Punnett, 2020). Substance abuse can commonly be found in comorbidity with other psychological disorders. Altogether, this comorbidity further contributes to the workers' likelihood of committing suicide.

Shaw, et al. (2020) report that workers that engage in heavy manual labor are significantly affected by opioid overdose death (OOD) and opioid use disorder (OUD), as 63.4% of opioid users turn to opioids to relieve physical pain. Approximately 40% of US workers experience chronic or recurrent musculoskeletal pain. The sources of their pain are often related to back pain from physical labor at work.

From the observations of this research, I suggest that the workers' environment and organization are factors that predispose construction and extraction workers to the development of opioid use disorder (OUD). This is in line with Shaw, et al. (2020)'s finding in Work Environment Factors and Prevention of Opioid-Related Deaths that there has been a dramatic increase in both prescription and illicit opioid use since 2000 for treating acute and chronic pain that is rooted in the workplace.

Physical signs of stress	Psychological signs of stress	Behavioral signs of stress
• Tiredness • Indigestion • Headaches • Changes in appetite • Weight gain or loss • Joint and back pain • Dizziness • A tight chest	• Anxiety • Tearfulness • Low mood • Mood changes • Indecision • Loss of motivation • Increased sensitivity • Low self-esteem	• Increased smoking and drinking • Withdrawal or aggression • Lateness • Recklessness • Difficulty concentrating

Table 2: Signs of Stress Experienced by Construction Workers (Spruce, 2017)

The connection between opioids use, especially opioid use disorder (OUD), and suicides are worth noting as suicides involving prescription and illicit opioids have increased. The use of opioids brings workers at higher risk for suicide-related behaviors such as ideation, planning, and attempts (Ilgen, et al., 2016).

Summary and Conclusion

The scope of this research focused on three occupational groups at high risk for suicide, which are the first responders, armed forces, and the construction and extraction field. Although the specific psychological and biological effects experienced by the workers can be specifically different depending on the occupational group, this research generally reinforces Chopra's (2009) claim that "workplace factors may precipitate illness as well as perpetuate disability with mental illness". This claim is attributed to the working conditions and environments that workplaces have. The occupational risk factors present in the workplace can predispose workers to specific psychological disorders, with Common Mental Disorders such as depression and anxiety commonly being found in comorbidity with sleep disorders or substance abuse. The key finding of this research is that a disruptive social fabric is a common pattern exhibited by various occupational groups with high suicide rates. By identifying occupational risk factors, it aims to recommend or suggest occupational protective factors.

Future Directions/Recommendations

As this research discusses the relationship between occupational groups to workplace suicide, it recognizes the importance of this contemporary issue and the need to address the problem. The scope of this research paper is limited to three occupational groups; therefore, the researcher recommends an analysis encompassing more occupational groups to have a broader perspective on this issue. Additionally, confounding variables can inevitably be present when examining biopsychosocial matters; thus, the researcher further suggests for future research to take into consideration the possibility of these confounding variables when conducting their analysis. On another note, this research identified occupational risk factors that contribute to the occupational groups and their working environments being highly susceptible to increasing suicide rates. With this in mind, the research calls that attention to this problem should not be solely focused on the loss of productivity as a result of high suicide rates, but to address the occupational risk factors and turn

them into occupational protective factors. The specific platform in building occupational protective factors can vary from one occupational group to another, for as long as the cumulative effort is to protect the country's workers physically, mentally, and socially.

References

Bender, A., & Kennedy, S. (2004). Mental Health and Mental Illness In The Workplace: Diagnostic and Treatment Issues. HealthcarePapers, 5(2), 54–67. doi:10.12927/hcpap..16824

Brook, T. V. (2020, October 1). Suicide rate among active-duty troops jumps to six-year high, COVID-19 stress could make it even worse. USA Today. https://www.usatoday.com/story/news/politics/2020/10/01/suicide-rate-among-active-duty-troops-jumps-six-year-high/5879477002/.

Burdick, G. (2019, August 05). Suicide in the workplace: A troubling trend. Retrieved February 02, 2021, from https://ehsdailyadvisor.blr.com/2019/08/suicide-in-the-workplace-a-troubling-trend/

Chopra, P. Mental health and the workplace: issues for developing countries. Int J Ment Health Syst 3, 4 (2009). https://doi.org/10.1186/1752-4458-3-4

Górny, Maciej. (2018). The importance of work in human life and development. The consequences of unemployment. 10.14746/r.2018.2.4.

Guardian News and Media. (2018, December 11). Why are America's farmers killing themselves? The Guardian. https://www.theguardian.com/us-news/2017/dec/06/why-are-americas-farmers-killing-themselves-in-record-numbers.

Heyman, M., Dill, J., & Douglas, R. (2018, April 10). Study: Police Officers and Firefighters Are More Likely to Die by Suicide than in Line of Duty. Ruderman Family Foundation. https://rudermanfoundation.org/white_papers/police-officers-and-firefighters-are-more-likely-to-die-by-suicide-than-in-line-of-duty/.

Ilgen, M. A., Bohnert, A., Ganoczy, D., Bair, M. J., McCarthy, J. F., & Blow, F. C. (2016). Opioid dose and risk of suicide. Pain, 157(5), 1079–1084. https://doi.org/10.1097/j.pain.0000000000000484

Law, Y. W., Yip, P. S. F., Zhang, Y., & Caine, E. D. (2014). The chronic impact of work on suicides and under-utilization of psychiatric and psychosocial services. Journal of Affective Disorders, 168, 254–261. doi:10.1016/j.jad.2014.06.031

Lulla, A., Tian, L. L., Philip Moy, H., Mueller, K., & Svancarek, B. (2020, February 1). CE Article: The EMS Suicide Threat. EMS World. https://www.emsworld.com/1223779/ce-article-ems-suicide-threat

Mitchell, S., & Choi, B. (2018, September 13). Job strain, long work hours, and suicidal thoughts. Retrieved February 01, 2021, from https://blogs.cdc.gov/niosh-science-blog/2018/09/13/suicide-prevention/

Pt, Wong & Low, Adrian. (2018). Improving Workplace Productivity: Applications of Maslow's Need Theory and Locke's Goal-Setting. 10.23880/pprij-16000189.

Putnam, R. D. (2000). Bowling alone: The collapse and revival of American community. New York: Simon & Schuster.

Shaw, W. S., Roelofs, C., & Punnett, L. (2020). Work Environment Factors and Prevention of Opioid-Related Deaths. American Journal of Public Health, 110(8), 1235–1241. doi:10.2105/ajph.2020.305716

Spruce, H. (2017, May 5). Suicide in the Construction Industry: The Silent Killer. https://www.ehstoday.com/construction/article/21919003/suicide-in-the-construction-industry-the-silent-killer

Thomas, N. (2018, November 15). These jobs have highest suicide rates in the United States, according to the CDC. Retrieved February 27, 2021, from https://www.cnn.com/2018/11/15/health/occupational-suicide-rate-cdc-study

Tsirigotis, K., Gruszczynski, W., & Tsirigotis, M. (2011). Gender differentiation in methods of suicide attempts. Medical science monitor: international medical journal of experimental and clinical research, 17(8), PH65–PH70. https://doi.org/10.12659/msm.881887

Uniformed Services University. (n.d.). Suicide in the Military. Center for Deployment Psychology. https://deploymentpsych.org/disorders/suicide-main